

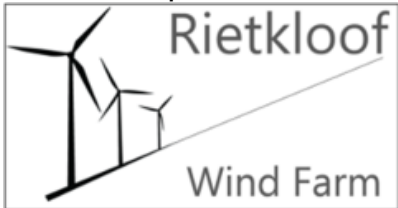

BASIC ASSESSMENT REPORT

BASIC ENVIRONMENTAL ASSESSMENT

DEA Reference Number: 14/12/16/3/3/1/1590
DEA&DP Reference Number: 16/3/3/6/4/1/C1/5/0096/16

132 kV OVERHEAD DISTRIBUTION LINE AND SUBSTATION FOR THE PROPOSED RIETKLOOF WIND ENERGY FACILITY, MATJIESFONTEIN, NORTHERN AND WESTERN CAPE PROVINCES

FINAL (Version 1)

<p>Prepared for:</p>  <p>Rietkloof Wind Farm (Pty) Ltd</p>	<p>Prepared by:</p>  <p>EOH Coastal & Environmental Services</p>
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<p>South Africa</p>	<p>South Africa</p>

8 August 2016

BASIC ASSESSMENT REPORT



environmental affairs

Department:
Environmental Affairs
REPUBLIC OF SOUTH AFRICA

(For official use only)

File Reference Number:

Application Number:

Date Received:

Basic assessment report in terms of the Environmental Impact Assessment Regulations, 2014, promulgated in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended.


Kindly note that:

1. This **basic assessment report** is a standard report that may be required by a competent authority in terms of the EIA Regulations, 2014 and is meant to streamline applications. Please make sure that it is the report used by the particular competent authority for the activity that is being applied for.
2. This report format is current as of **08 December 2014**. It is the responsibility of the applicant to ascertain whether subsequent versions of the form have been published or produced by the competent authority
3. The report must be typed within the spaces provided in the form. The size of the spaces provided is not necessarily indicative of the amount of information to be provided. The report is in the form of a table that can extend itself as each space is filled with typing.
4. Where applicable **tick** the boxes that are applicable in the report.
5. An incomplete report may be returned to the applicant for revision.
6. The use of "not applicable" in the report must be done with circumspection because if it is used in respect of material information that is required by the competent authority for assessing the application, it may result in the rejection of the application as provided for in the regulations.
7. This report must be handed in at offices of the relevant competent authority as determined by each authority.
8. No faxed or e-mailed reports will be accepted.
9. The signature of the EAP on the report must be an original signature.
10. The report must be compiled by an independent environmental assessment practitioner.
11. Unless protected by law, all information in the report will become public information on receipt by the competent authority. Any interested and affected party should be provided with the information contained in this report on request, during any stage of the application process.
12. A competent authority may require that for specified types of activities in defined situations only parts of this report need to be completed.
13. Should a specialist report or report on a specialised process be submitted at any stage for any part of this application, the terms of reference for such report must also be submitted.
14. Two (2) colour hard copies and one (1) electronic copy of the report must be submitted to the competent authority.
15. Shape files (.shp) for maps must be included in the electronic copy of the report submitted to the competent authority.

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REVISIONS TRACKING TABLE

This report should be cited as follows: EOH Coastal & Environmental Services, August 2016: 132 kV Overhead Distribution Line and Substation for the Proposed Rietkloof Wind Energy Facility, Matjiesfontein, Northern and Western Cape Provinces, South Africa, Final Basic Assessment Report. EOH CES, Cape Town.

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UPDATING FROM DRAFT TO FINAL

All information added to the Draft Basic Assessment Report to update it to the Final Basic Assessment Report, was underlined for ease of reference. In addition, important information deleted from the Draft Report was strikethrough to show the changes made.

BASIC ASSESSMENT REPORT

DOCUMENT CONTROL

Overview of the requirements for a Basic Assessment Report in terms of Appendix 1 of Government Notice (GN) R.982 and where the relevant information can be found in this Report.

Requirements as per Appendix 1	Relevant section in report
(1) A basic assessment report must contain the information that is necessary for the competent authority to consider and come to a decision on the application, and must include (a) details of (i) the EAP who prepared the report; and (ii) the expertise of the EAP, including a curriculum vitae;	See Appendix H: Details of EAP and expertise
(b) the location of the activity, including; (i) the 21 digit Surveyor General code of each cadastral land parcel; (ii) where available, the physical address and farm name; (iii) where the required information in items (i) and (ii) is not available, the coordinates of the boundary of the property or properties;	See Section A1 (a)
(c) a plan which locates the proposed activity or activities applied for as well as associated structures and infrastructure at an appropriate scale; or, if it is (i) a linear activity, a description and coordinates of the corridor in which the proposed activity or activities is to be undertaken; or (ii) on land where the property has not been defined, the coordinates within which the activity is to be undertaken;	See Appendix A: Maps
(d) a description of the scope of the proposed activity, including (i) all listed and specified activities triggered and being applied for; and (ii) a description of the activities to be undertaken including associated structures and infrastructure;	See Section A1 (a) and (b)
(e) a description of the policy and legislative context within which the development is proposed including (i) an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks, and instruments that are applicable to this activity and have been considered in the preparation of the report; and (ii) how the proposed activity complies with and responds to the legislation and policy context, plans, guidelines, tools frameworks, and instruments;	See Section A11
(f) a motivation for the need and desirability for the proposed development including the need and desirability of the activity in the context of the preferred location;	See Section A10
(g) a motivation for the preferred site, activity and technology alternative;	See Section A2, A10 and Section E
(h) a full description of the process followed to reach the proposed preferred alternative within the site, including: (i) details of all the alternatives considered;	See Section A2
(ii) details of the public participation process undertaken in terms of regulation 41 of the Regulations, including copies of the supporting documents and inputs;	See Section C and Appendix E for copies of the supporting documents
(iii) a summary of the issues raised by interested and affected parties, and an indication of the manner in which the issues were incorporated, or the reasons for not including them;	See Section C3 and C4
(iv) the environmental attributes associated with the alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;	See Section B and Section A1(a)
(v) the impacts and risks identified for each alternative, including the nature, significance, consequence, extent, duration and probability of the impacts, including the degree to which these impacts (aa) can be reversed; (bb) may cause irreplaceable loss of resources; and (cc) can be avoided, managed or mitigated;	See Section D and Appendix F: Impact Assessment
(vi) the methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts	See Appendix K

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Requirements as per Appendix 1	Relevant section in report
and risks associated with the alternatives;	
(vii) positive and negative impacts that the proposed activity and alternatives will have on the environment and on the community that may be affected focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;	See Section D and Appendix F: Impact Assessment
(viii) the possible mitigation measures that could be applied and level of residual risk;	See Section D and Appendix F: Impact Assessment
(ix) the outcome of the site selection matrix;	See Section A2
(x) if no alternatives, including alternative locations for the activity were investigated, the motivation for not considering such; and	N/A
(xi) a concluding statement indicating the preferred alternatives, including preferred location of the activity;	See Section E
(i) a full description of the process undertaken to identify, assess and rank the impacts the activity will impose on the preferred location through the life of the activity, including (i) a description of all environmental issues and risks that were identified during the environmental impact assessment process; and (ii) an assessment of the significance of each issue and risk and an indication of the extent to which the issue and risk could be avoided or addressed by the adoption of mitigation measures;	See Section D
(j) an assessment of each identified potentially significant impact and risk, including (i) cumulative impacts; (ii) the nature, significance and consequences of the impact and risk; (iii) the extent and duration of the impact and risk; (iv) the probability of the impact and risk occurring; (v) the degree to which the impact and risk can be reversed; (vi) the degree to which the impact and risk may cause irreplaceable loss of resources; and (vii) the degree to which the impact and risk can be avoided, managed or mitigated;	See Section D and Appendix F: Impact Assessment
(k) where applicable, a summary of the findings and impact management measures identified in any specialist report complying with Appendix 6 to these Regulations and an indication as to how these findings and recommendations have been included in the final report;	See Section D1 and D2
(l) an environmental impact statement which contains (i) a summary of the key findings of the environmental impact assessment; (ii) a map at an appropriate scale which superimposes the proposed activity and its associated structures and infrastructure on the environmental sensitivities of the preferred site indicating any areas that should be avoided, including buffers; and (iii) a summary of the positive and negative impacts and risks of the proposed activity and identified alternatives;	See Section D2
(m) based on the assessment, and where applicable, impact management measures from specialist reports, the recording of the proposed impact management objectives, and the impact management outcomes for the development for inclusion in the EMPr;	See Section D and Appendix F: Impact Assessment
(n) any aspects which were conditional to the findings of the assessment either by the EAP or specialist which are to be included as conditions of authorisation;	See Section E
(o) a description of any assumptions, uncertainties, and gaps in knowledge which relate to the assessment and mitigation measures proposed;	See Section A1 (a)
(p) a reasoned opinion as to whether the proposed activity should or should not be authorised, and if the opinion is that it should be authorised, any conditions that should be made in respect of that authorisation;	See Section E
(q) where the proposed activity does not include operational aspects, the period for which the environmental authorisation is required, the date on which the activity will be concluded, and the post construction monitoring requirements finalised;	See Section E
(r) an undertaking under oath or affirmation by the EAP in relation to: (i) the correctness of the information provided in the reports; (ii) the inclusion of comments and inputs from stakeholders and I&APs; (iii) the inclusion of inputs and recommendations from the specialist reports where	See Error! Reference source not found.

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Requirements as per Appendix 1	Relevant section in report
relevant; and (iv) any information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested and affected parties; and	
(s) where applicable, details of any financial provisions for the rehabilitation, closure, and ongoing post decommissioning management of negative environmental impacts;	NA
(t) any specific information that may be required by the competent authority; and	See this table and the Table on page below
(u) any other matters required in terms of section 24(4)(a) and (b) of the Act.	NA

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TECHNICAL INFORMATION

<u>Component</u>	<u>Description/ dimensions</u>
<u>Length of powerline</u>	<ul style="list-style-type: none"> • <u>200m corridor from substation 5 to Bon Espirange substation (Preferred Alternative) (Alternative A1: 5A+A1b+A2) - 13.845km</u> • <u>200m corridor from substation 6 to Bon Espirange substation (Alternative A2: 6A+A1a+A2) - 14.355km</u> • <u>200m corridor from substation 5 to Komsberg substation (Alternative B1: 5B+B1) 15.72km</u> • <u>200m corridor from substation 6 to Komsberg substation (Alternative B2: 6B+B1) - 16.958km</u> • <u>200m corridor from substation 5 via Central Hub substation to Bon Espirange substation or Komsberg substation</u> • <u>Alternative 5C - 4.607km</u> • <u>Alternative CH1A - 5.785km</u> • <u>Alternative CH2a - 4.864km</u> • <u>Alternative 6C - 6.220km</u> • <u>Alternative CH1B - 5.904km</u> • <u>Alternative CH2b - 7.373km</u>
<u>Area of servitude</u>	<u>31m</u>
<u>Clearance of height of powerline</u>	<u>Up to 32m</u>
<u>Area occupied by inverter/ transformation stations/ substations</u>	<u>200m x 200m substation</u>
<u>Capacity of powerlines</u>	<u>132 kilovolts</u>
<u>Area occupied by both permanent and construction laydown areas</u>	<u>There will be no permanent laydown areas required. Temporary laydown areas will overlap with the road as far as possible and no vegetation clearing will be required.</u>

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LIST OF ABBREVIATIONS

AU	Animal Unit
BA	Basic Assessment
BID	Background Information Document
CAPE	Cape Action for People and the Environment
CARA	Conservation of Agricultural Resources Act
CBA	Critical Biodiversity Area
CES	Coastal and Environmental Services
CFR	Cape Floristic Region
CSIR	Council for Scientific and Industrial Research
CVs	Curriculum Vitae
DAFF	Department of Agriculture
DEA	Department of Environmental Affairs
DEAT	Department of Environmental Affairs and Tourism
DENC	Department of Environmental and Nature Conservation
DM	District Municipality
DME	Department of Minerals and Energy
DoE	Department of Energy
DWA	Department of Water Affairs
DWS	Department of Water and Sanitation
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
ECA	Environmental Conservation Act
EIA	Environmental Impact Assessment
EMFs	Environmental Management Framework
EMPr	Environmental Management Programme
ESA	Ecological Support Area
EWT	Endangered Wildlife Trust
FEPA	Freshwater Ecosystem Priority Areas
GHG	Greenhouse gases
GIS	Geographical Information System
GNR	Government Notice Regulation
ha	Hectare
HIA	Heritage Impact Assessment
I&APs	Interested and Affected Parties
IBA	Important Bird Area
IDP	Integrated Development Plan
IFC	International Finance Corporation
IPP	Independent Power Producer
IRP	Integrated Resource Plan
IUCN	International Union for Conservation of Nature
JV	Joint Venture
kV	Kilovolt
LM	Local Municipality
m/s	Meters per second
MAP	Mean Annual Precipitation
MAT	Mean Annual Temperature

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MPRDA	Mineral and Petroleum Resources Development Act (Act No. 28 of 2002)
MSA	Municipal Systems Act
MW	Megawatts
NDP	National Development Plan
NEM: AQA	National Environmental Management: Air Quality Act (Act No. 39 of 2004)
NEM: BA	National Environment Management: Biodiversity Act (Act No. 10 of 2004)
NEM: PAA	National Environmental Management: Protected Areas Act (Act No. 57 of 2003)
NEM: WMA	National Environmental Management: Waste Management Act (Act No. 59 of 2008)
NEMA	National Environmental Management Act (Act No. 107 of 1998) (as amended)
NERSA	National Energy Regulator of South Africa
NFEPA	National Freshwater Ecosystem Priority Areas
NPAES	National Protected Areas Expansion Strategy
NRTA	National Road Traffic Act
NSA	Noise Sensitive Areas
NWA	National Water Act (Act No.36 of 1998)
PoS	Plan of Study
PPA	Power Purchase Agreement
PPP	Public Participation Process
REFIT	Renewable Feed In Tariff
REIPPPP	Renewable Energy Independent Power Producer Procurement Programme
SA	Secondary Area
SAAO	South African Astronomical Observatory
SACCA	South African Civil Aviation Authority
SACNASP	South African Council for Natural Scientific Professions
SAHRA	South African Heritage Resources Agency
SALT	Southern African Large Telescope
SANBI	South African National Biodiversity Institute
SANParks	South African National Parks
SANRAL	South African National Roads Agency
SAWS	South African Weather Services
SDF	Spatial Development Framework
SDP	Spatial Development Plan/ Site Development Plan
SGM	Shale Gas Mining
SIA	Social Impact Assessment
SIPS	Strategic Infrastructure Projects
SKA	Square Kilometre Array
SKEP	Succulent Karoo Ecosystem Programme
SSC	Species of Special Concern
STEP	Subtropical Thicket Ecosystem Project
TCP	Technical Cooperation Permit
ToR	Terms of Reference
UNFCCC	United Nations Framework Convention on Climate Change
WASA	Wind Atlas for South Africa
WEF	Wind Energy Facility
WESSA	Wildlife and Environmental Society of Southern Africa
WRC	Water Research Commission
WWF	Worldwide Fund for Nature

SECTION A: ACTIVITY INFORMATION

Has a specialist been consulted to assist with the completion of this section? YES NO
If YES, please complete the form entitled "Details of specialist and declaration of interest" for the specialist appointed and attach in Appendix I.

1. PROJECT DESCRIPTION

a) Describe the project associated with the listed activities applied for

Background

Rietkloof Wind Farm (Pty) Ltd, a subsidiary of G7 Renewable Energies (Pty) Ltd, propose to develop electrical infrastructure in the form of a single 132 kilovolt (kV), above-ground electrical power line (distribution line) and one onsite 33/132kV substation. There's also a potential to construct one central hub 132kV substation, should both the Brandvalley and Rietkloof WEFs become preferred bidders as explained in the sections below. This line will be required to evacuate up to 140 megawatt (MW) of power from the proposed Rietkloof Wind Energy Facility (WEF), located near Laingsburg in the Northern and Western Cape Provinces, South Africa. This power will ultimately be distributed to the national grid, through connections with an external Eskom substation. While the two projects (wind farm and distribution infrastructure) are related, only the electrical distribution line and one 132kV onsite substation are being applied for in this application (i.e. this document only concerns the power line and not the wind farm). The need for separate applications is due to the fact that the 132kV transmission line and 132kV yard of the 33/132kV substation will likely be ceded to Eskom, while the Rietkloof Wind Farm (Pty) Ltd will retain ownership of the WEF.

The Rietkloof WEF has not yet been authorised, and is currently in the EIR phase under a separate and distinct EIA application (DEA Ref Number: 14/12/16/3/3/2/899). The intention is to bid these projects under the Renewable Energy Independent Power Producer Procurement Programme, as managed by the Department of Energy, with the aim to obtain preferred bidder status in order to construct the WEF and feed the electricity into the national grid. Please note: there has currently been no preferred bidder status awarded for Brandvalley¹ or Rietkloof WEFs.

This project is being submitted under the NEMA regulations for environmental authorisation, with the DEA acting as the competent authority. The proponent is Rietkloof Wind Farm (Pty) Ltd, who appointed EOH Coastal and Environmental Services (EOH CES) as the EAP.

The EOH CES project team is comprised of the following:

Mr. Marc Hardy – EAP and project leader, responsible for quality control and review;
Ms Amber Jackson – Project manager;
Mr. Gideon Raath – Report production and PPP.

This project is a Basic Assessment process for the construction of:

- A. One 33/132kV on-site substations (please note that the 33kV substation yard is assessed as part of the EIA process and only the 132 kV yard form part of this application);
- B. 200m wide corridor for the 132kV electrical distribution line; and
- C. Grid connection via one of three alternatives.

A generalised depiction of the infrastructure associated with this application is shown in Figure 1 below. The project entails connection from an on-site substation (A), evacuation via a 132kV overhead line (B), and ultimate connection with an Eskom substation (C).

¹ Brandvalley WEF is a second 140MW WEF proposed adjacent to the Rietkloof project.

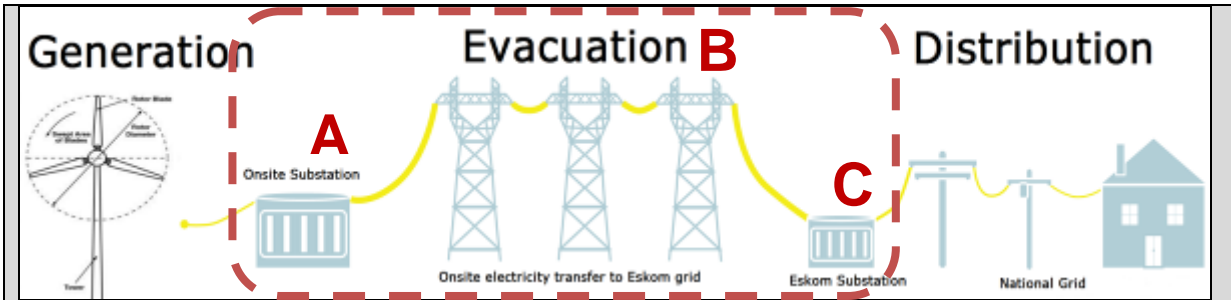


Figure 1: Typical WEF electricity evacuation process. The red dotted square indicates the components relevant to this application.

A. One 132kV Substation (A)

Including the internal components such as transformers, isolators, cabling and light mast, as required by Eskom. This 33/132kV on-site substation will have a footprint of up to 200m x 200m that will be inclusive of site offices, storage areas, ablution facilities and the maintenance building. While there are a few alternative locations proposed for this substation, only one will be constructed for this project. This substation will be the interface between the different connections from the wind turbines (from the WEF mentioned above), by receiving all the 33kV connection cables and powerlines from the individual turbines, from where one 132kV line will evacuate the power to an external substation owned by Eskom. The on-site substation is denoted with a large, red “A” on Figure 1 above.

B. 132kV overhead distribution line (B)

To connect the onsite 132kV substation mentioned above, to the national grid. The pylons for this line will have an average spacing of between 250m and 300m, and will consist of a mixture of self-supporting monopoles, guyed monopoles as well as lattice structures. The maximum height will be up to 32m, regardless of the design type used. The servitude will be up to 31m wide. A 200m wide corridor will be applied for to allow for micro-sitting. This distribution line is denoted with a large, red “B” on Figure 1 above.

C. Connection to the national grid (C)

In order to connect to the Rietkloof Wind Farm, three (3) alternatives for grid connection have been assessed as part of this report and the preferred alternative were informed by environmental and technical considerations and Eskom’s preference:

1. Connection to the existing Komsberg Substation (SS) currently proposed to be upgraded with a 132/400kV transformer. This substation is located approximately 12km from the project site and is owned and managed by Eskom; or
2. Connection to the Bon Espirange satellite 132kV substation located approximately 7km from the project boundary. The Bon Espirange satellite substation has not yet been built, but is planned by Eskom and other IPPs, as an alternative to connecting all the wind farms west of Komsberg SS, directly to the Eskom Komsberg Substation. The central idea to this SS is the location, whereby WEFs to the West and North of the project region may also connect to the national grid, and thus reduce the infrastructure required to service each project. The Bon Espirange SS will be managed by Eskom.
3. Construction of a central switching station (up to 200m x 200m) to be shared by both Brandvalley and Rietkloof WEFs (if both are awarded preferred bidder status). For the purposes of this application, this substation is referred to as the “Central Hub Substation”. The construction of the 132kV Central Hub SS depends on the following factors:
 - The environmental sensitivities of the region;
 - The cost of the construction;
 - The existing potential of the Komsberg or Bon Espirange Substations to couple and successfully take off the combined power generated by the Brandvalley and Rietkloof WEFs (i.e. if the receiving Substation has the capacity to connect and receive such power);
 - Whether Eskom approve the connection (this will largely be based on the capacity available as well).

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If the Central Hub Substation is ultimately approved for connection by Eskom, each project (Brandvalley WEF and Rietkloof WEF) will construct their own 132kV substation on-site, and connect to the Central Hub Substation from there. From the Central Hub SS an additional, single 132kV line for both projects will then be constructed to lead to either the Komsberg or the Bon Espirange Substation, and ultimately the national grid. This option is denoted with a large, red “C” in the above Figure 1. The footprint of this Central Hub Substation is located within the Brandvalley project footprint and will therefore be applied for in the Brandvalley Basic Assessment report.

Construction phase

The following activities (Table 1) are proposed during the construction phase of the project.

Table 1: Construction phase activities

Phase	Duration	Activities
<u>Construction phase</u>	<u>12-18 months</u>	<u>Site Establishment</u> 1. <u>Setting out of construction area</u> 2. <u>Delivery of equipment to site</u>
<u>Civil and Electrical Works</u>		1. <u>Topsoil stripping, where necessary, and bulk earthworks (if needed) for roads, hardstanding and pylon foundations.</u> 2. <u>Concrete works</u> 3. <u>Fixing reinforcement</u> 4. <u>Cable ducting, trenching and laying</u> 5. <u>Road and hardstanding construction (placement of aggregate layers)</u> 6. <u>Guy-wiring of pylons</u> 7. <u>Pylon erection and electrical cable stringing (where there is an overhead power line)</u> 8. <u>Above activities but within the substation and relevant to substation construction and including building construction works e.g. bricklaying, roofing, installation and testing of electrical equipment such as transformers and switchgear</u> 9. <u>Testing and commissioning of pylons and conductors</u>

A borrow pit will not be established for this project as material will be sourced from the same source as for the WEF either from an existing/ new borrow pit. local staff will be appointed as far as possible to reduce the need for accommodation. Staff that cannot be sourced from the local community, will be accommodated in nearby towns such as Laingsburg, Matjiesfontein, Touwsriver or Sutherland.

Operational phase

During the operational phase, the pylons and substation would need to be accessed for routine maintenance. The frequency will be on a needs be basis. In order to access the pylons, the access road would need to be maintained in a state that, at least, allows for 4x4 access. The servitude will be maintained and monitored to avoid erosion and the establishment of alien invasive plant species. The operational phase will last up to 25 years. Thereafter, Eskom will decide whether the infrastructure can continue to be used or whether there is a need to decommission.

Location

The proposed project is located within the same property and adjacent to the proposed Rietkloof WEF (DEA Reference Number: 14/12/16/3/3/2/899), roughly 15km along the R354 heading north towards Sutherland. While some properties of the WEF and the distribution line overlap, some properties are unique to each project. This is because some of the properties are shared in terms of infrastructure. Regardless, the properties included in this report relate only to this application. Exact property number, portion number and farm name details are provided in Table 2 below.

The project footprint lies within the Western Cape and Northern Cape Provinces. The project is located within the

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Laingsburg Local Municipality seated within the Central Karoo District Municipality (located in the Western Cape) and within the Karoo Hoogland Local Municipality located within the Namakwa District Municipality (within the Northern Cape).

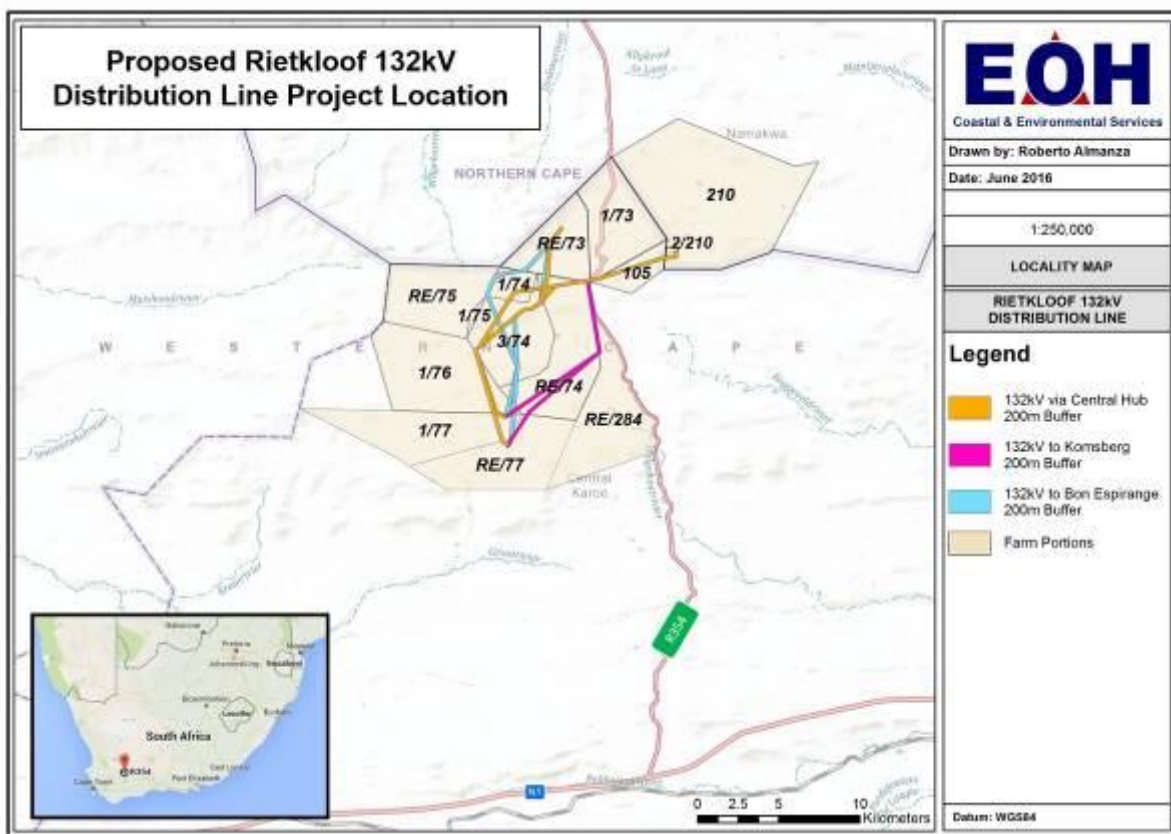


Figure 2: Project locality map, indicating the general location of the project study area, and the three substation alternatives. The property portions included in this application include all distribution lines and onsite substation alternatives.

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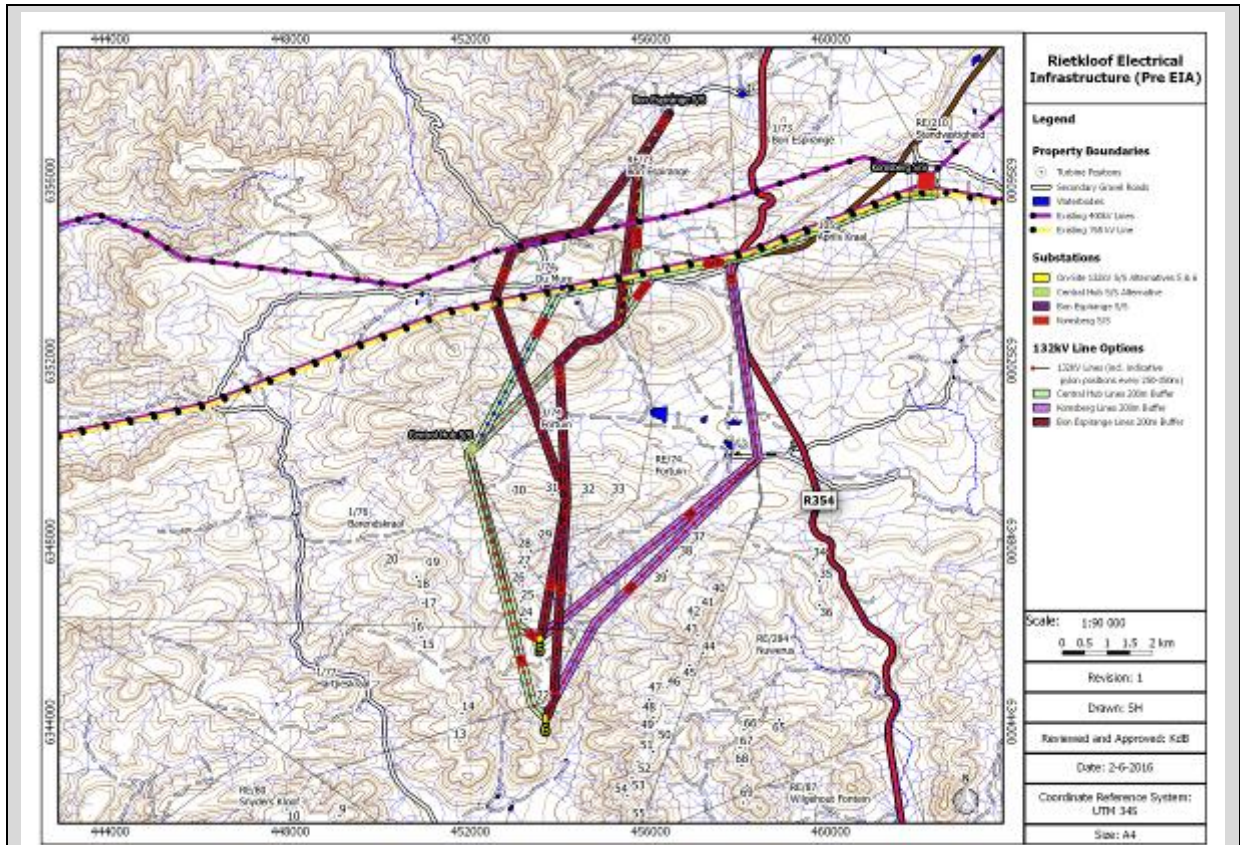


Figure 3: Proposed 132kV distribution line layout alternatives (pre-EA layout).

As the project is designed to form part of the Brandvalley Wind Energy Facility and the Rietkloof Wind Energy Facility (should both be awarded preferred bidder status), the broader context within which the powerline will operate is indicated below, as a means of providing context for the reader.

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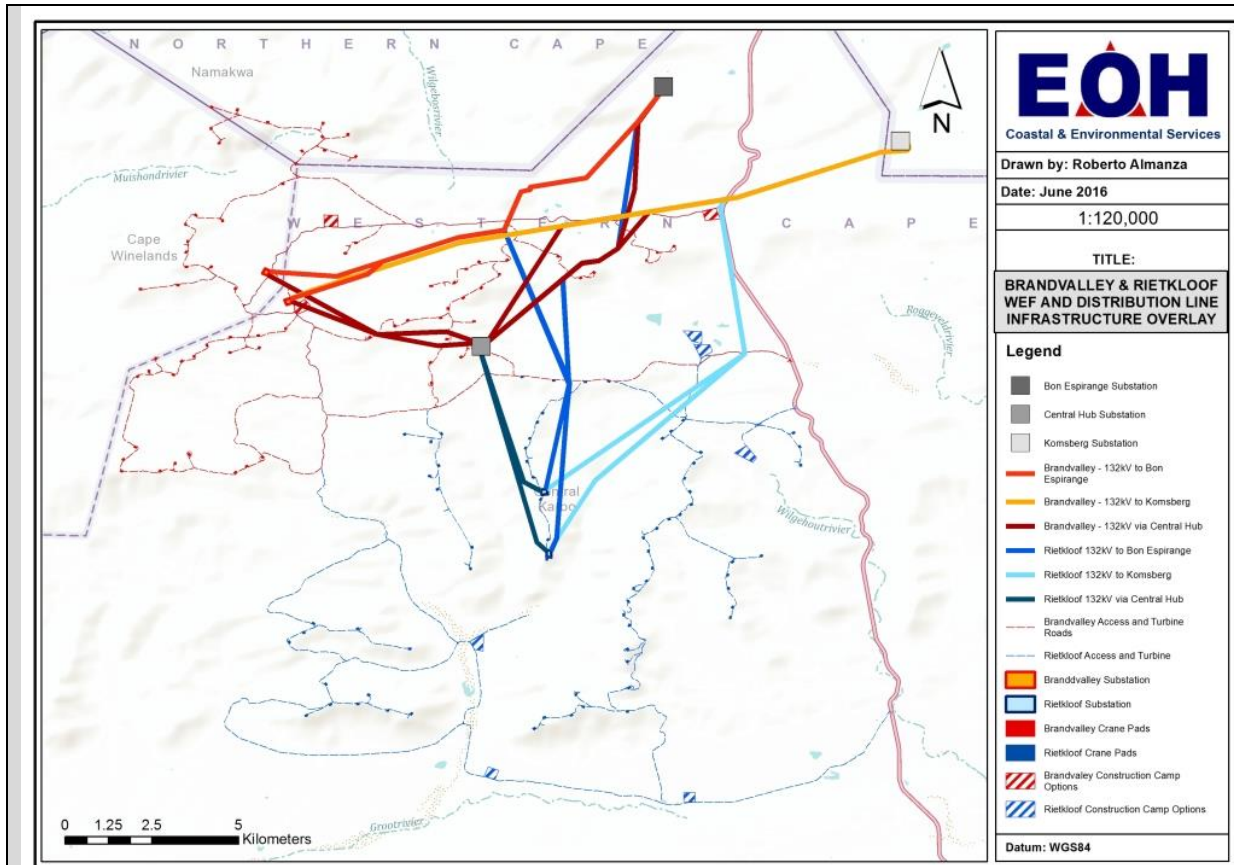


Figure 4: All distribution line alternatives (for both this project, and the Rietkloof 132kV distribution line project), overlain onto the proposed Brandvalley and Rietkloof Wind Energy Facilities.

Please note: The EIA process for both wind farms are still underway, with the process being in the EIA phase at the time of completion of this report. As such, the layout for the WEF's illustrated here are not final and likely to be amended as the project develops further. The layout of the WEF's are thus to be regarded as indicative only. Should precise location information be required for the WEF's, please consult the latest Brandvalley Wind Energy Facility and Rietkloof Wind Energy Facility documents.

Study Area

The study area for this application comprises the footprint of the infrastructure of this project. This currently includes all layout alternatives (i.e. the different locations considered for the power line), service access roads, servitudes necessary and pylon foundations. Additionally, a 100m corridor on each side of the different distribution line alternatives are also considered in this study, in order to allow for micro-siting. The 100m corridor on each side of the distribution line thus represents the maximum extent of the project. The total power line corridor will thus be 200m in width. Micro-siting will inform the final placement of the infrastructure, however, the final placement will always remain within the proposed corridor.

Properties relevant to this application were determined by overlaying all potential infrastructure (including layout alternatives) onto a farm portion spatial data layer of this region, and determining which properties would be required should all of the infrastructure be developed. This ensured no properties were missed. All the relevant properties have thus been included in the extent of the study area, and are detailed in the Table 2.

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Table 2: Landowner and neighbouring property information for the proposed development.

Landowners			
Portion and Farm #	Name	Affiliation	Surveyor ID
RE/210	Standvastigheid Familie Trust	Standvastigheid	C0720000000002100000
2/210	Eskom SOC Limited	Standvastigheid	C0720000000002100002
1/73	Douglas & Esme Caldo	Bon Espirange	C0430000000007300001
RE/74	A D V Le Roux Family Trust c/o Andries Le Roux	Fortuin	C0430000000007400000
3/74	A D V Le Roux Family Trust c/o Andries Le Roux	Fortuin	C0430000000007400003
1/75	A D V Le Roux Family Trust c/o Andries Le Roux	Brandvalley	C0430000000007500001
1/76	Mooi Nooientjies Trust c/o Christo Mathee	Barendskraal	C0430000000007600001
1/77	Du Toit Thiersen (Pty) Ltd c/o Johan du Toit	Hartjieskraal	C0430000000007700001
RE/77	Ernest Marais	Hartjieskraal	C0430000000007700000
105	Douglas & Esme Caldo	Aprils Kraal	C0430000000010500000
RE/73	Piet Conradie	Bon Espirange	C0430000000007300000
1/74	Ou Mure Boerdery c/o Polla van der Westhuizen	Ou Mure	C0430000000007400001
1/76	Mooi Nooientjies Trust c/o Christo Mathee	Barendskraal	C0430000000007600001
RE/284	ZB Loots Familie Trust / Ziegfried Loots	Nuwerus	C0430000000002840000

This project is a separate and unique application to that of the following:

- **Brandvalley 132kV distribution line BA project:** 14/12/16/3/3/1/1591; no DENC reference number received.
- **Brandvalley WEF EIA:** DEA Reference Number: 14/12/16/3/3/2/900; DENC Reference Number: NC/NAT/ZFM/KHE/BLA1/2016.
- **Rietkloof WEF EIA:** DEA Reference Number: 14/12/16/3/3/2/899.

All three projects share similar locations and connections to each other (due to their close proximity), but are separate applications.

Approach to the BA Process:

In addition to the Rietkloof WEF, Brandvalley Wind Farm (Pty) Ltd., another subsidiary of G7 Renewable Energies, proposes to develop the Brandvalley Wind Farm, which would require the evacuation of power via similar transmission infrastructure such as that of this application. The proposed Brandvalley WEF is located on some overlapping and adjacent properties to the Rietkloof WEF. Although the properties overlap, the actual project footprints do not overlap. These two WEFs are currently assessed under separate EIA authorisation applications.

Furthermore, while the WEF project development footprints do not overlap, their electrical infrastructure alternatives comprises a combination of distribution lines from both WEFs, as this is most logical / practical. The

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Basic Assessments (BA's) and development of the electrical infrastructure are thus intended to run in parallel as two separate assessments. It is thus proposed to assess the Brandvalley 132kV electrical distribution line in a separate Basic Assessment process. Since the two BA processes are intended to run concurrently, some tasks relevant to the Public Participation Process (PPP) were combined for both assessments.

Assumptions, Limitations and Gaps in Knowledge

This report is based on information that is currently available and, as a result, the following limitations and assumptions under which this report was compiled are implicit:

- The report is based on a project description taken from preliminary design specifications and site layouts for the proposed project that have not yet been fully optimised and are likely to undergo iterations and refinements (based on environmental and technical inputs) before they can be regarded as definitive. All 132kV distribution line infrastructure alternatives will, however, be contained within the 200m corridor assessed.
- Descriptions of the surrounding environment are based on project site-specific fieldwork and available literature.
- The field assessments were limited to a summer dry season observation due to time constraints. Although sufficient mitigation measures were recommended to follow the precautionary principle, this remains a limitation.
- The information provided in the reports have reference only to the study area and cannot be applied to other areas without detailed investigation.
- It is assumed that the existing roads and tracks within the facility to be used for the project will be upgraded while the new roads and associated transmission lines will avoid or span the observed water courses as far as possible.
- Any satellite imagery used may be outdated due to any land changes occurring since the imagery was taken.
- The worst case scenario impacts were determined and the precautionary principle was implemented throughout the study.

b) Provide a detailed description of the listed activities associated with the project as applied for

Listed activity as described in GN 983, 984 and 985	Description of project activity
Example: GN 734 Item xx xx): The construction of a bridge where such construction occurs within a watercourse or within 32 metres of a watercourse, measured from the edge of a watercourse, excluding where such construction will occur behind the development setback line.	A bridge measuring 5 m in height and 10m in length, no wider than 8 meters will be built over the Orange river
GNR 983 – Listing Notice 1, No 11: The development of facilities or infrastructure for the transmission and distribution of electricity- (i) Outside urban areas or industrial complexes with a capacity of more than 33 but less than 275 kilovolts;	The project entails the distribution of electricity via a 132kV distribution line in a rural region.
GNR 983 – Listing Notice 1, No 12: The development of- (x) buildings exceeding 100 square metres in	The Eskom substation yard will entail buildings that might exceed 100m ² , and/or occurs within 32m of a watercourse.

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<p>size; (xii) infrastructure or structures with a physical footprint of 100 square metres or more; where such development occurs – (a) within a watercourse;</p> <p>(c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse;</p>	<p>The pylon footprints and 132kV distribution line service road are likely to exceed 100m² and might need to be constructed within a watercourse and or within 32m of a watercourse.</p>
<p>GNR 983 – Listing Notice 1, No 19:</p> <p>The infilling or depositing of any material of more than 5 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 5 cubic metres from-</p> <p>(i) a watercourse;</p>	<p>The pylon footprints and 132kV distribution line service road are likely to require the infilling or depositing of any material of more than 5m³ or the, excavation, removal or moving of soil, sand, pebbles or rock of more than 5 cubic metres from a watercourse.</p>
<p>GNR 983 – Listing Notice 1, No 24:</p> <p>The development of-</p> <p>(ii) a road with a reserve wider than 13,5 meters, or where no reserve exists where the road is wider than 8 metres;</p>	<p>New service roads following the routes of the distribution line pylons, that is wider than 8 metres may be required.</p>
<p>GNR 983 – Listing Notice 1, No 27:</p> <p>The clearance of an area of 1 hectares or more, but less than 20 hectares of indigenous vegetation, except where such clearance of indigenous vegetation is required for –</p> <p>(i) the undertaking of a linear activity.</p>	<p>The construction of the Eskom yard at the Central hub substation might require the clearance of more than 1ha of vegetation.</p>
<p>GNR 983 – Listing Notice 1, No 28:</p> <p>Residential, mixed, retail, commercial, industrial or institutional developments where such land was used for agriculture or afforestation on or after 01 April 1998 and where such development:</p> <p>(ii) will occur outside an urban area, where the total land to be developed is bigger than 1 hectare;</p>	<p>The distribution line and substation construction may cumulatively or individually amount to an area of greater than 1 hectare being cleared.</p>
<p>GNR 983 – Listing Notice 1, No 56:</p> <p>The widening of a road by more than 6 metres, or the lengthening of a road by more than 1 kilometre-</p> <p>(ii) where no reserve exists, where the existing road is wider than 8 metres</p>	<p>In order to establish access roads to the pylons of the distribution line, it may be required to widen the existing roads to an area greater than 6 metres.</p>
<p>GNR 985 – Listing Notice 3, No 4:</p> <p>The development of a road wider than 4 metres with a reserve less than 13,5 metres.</p>	<p>The service access roads will likely be wider than 4 meters with a reserve less than 13.5 metres, during construction phase. The roads are likely to be constructed within an NPAES focus area containing critical biodiversity areas within the Northern Cape. Within the Western Cape, the service access roads are proposed within areas containing indigenous</p>

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<p>(a) In Northern Cape province:</p> <p>ii. Outside urban areas, in:</p> <p>(bb) National Protected Area Expansion Strategy Focus areas;</p> <p>(cc) Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority;</p> <p>(ee) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans;</p> <p>f) In Western Cape:</p> <p>i. Areas outside urban areas;</p> <p>(aa) Areas containing indigenous vegetation;</p>	<p>vegetation.</p>
<p>GNR 985 – Listing Notice 3, No 12:</p> <p>The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan.</p> <p>a) Western Cape province:</p> <p>i. Within any critically endangered or endangered ecosystem listed in terms of section 52 of the NEMBA or prior to the publication of such a list, within an area that has been identified as critically endangered in the National Spatial Biodiversity Assessment 2004;</p> <p>(d) In Northern Cape:</p> <p>i. Within any critically endangered or endangered ecosystem listed in terms of section 52 of the NEMBA or prior to the publication of such a list, within an area that has been identified as critically endangered in the National Spatial Biodiversity Assessment 2004;</p> <p>ii. Within critical biodiversity areas identified in bioregional plans;</p>	<p>Land clearance of an area of 300 square meters or more of indigenous vegetation is likely to take place during the construction phase of the project within the Western Cape (areas considered relevant for (a) (i) (ii)) and Northern Cape (areas considered relevant for (d) (i) (ii)).</p>
<p>GNR 985 – Listing Notice 3, No 14:</p>	<p>The construction of substation and associated</p>

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<p>The development of-</p> <p>(x) buildings exceeding 10 square metres in size;</p> <p>(xii) infrastructure or structures with a physical footprint of 10 square metres or more;</p> <p>Where such development occurs-</p> <p>(a) within a watercourse</p> <p>(c) if no development setback has been adopted, within 32 metres of a watercourse, measured from the edge of a watercourse.</p> <p>(a) In Northern Cape Province:</p> <p>ii. Outside urban areas, in:</p> <p>(bb) National Protected Area Expansion Strategy Focus areas</p> <p>(dd) Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority.</p> <p>(ff) Critical biodiversity areas or ecosystem service areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans;</p> <p>(f) In Western Cape:</p> <p>i. Outside urban areas, in:</p> <p>(bb) National Protected Area Expansion Strategy Focus areas</p> <p>(ff) Critical biodiversity areas or ecosystem service areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans;</p>	<p>infrastructure may occur within 32 metres of a watercourse and/or Critical Biodiversity Areas.</p> <p><u>The systematic biodiversity plans or bioregional plans have not been formally been adopted by the Competent authority for the Western Cape. Activity 14 (f) (i) (ff) is therefore not applicable to the proposed development.</u></p>
<p>GNR 985 – Listing Notice 3, No 18:</p> <p>The widening of a road by more than 4 metres, or the lengthening of a road by more than 1 kilometre.</p> <p>(a) In Northern Cape province:</p> <p>i. Outside urban areas, in:</p> <p>(bb) National Protected Area Expansion Strategy Focus areas;</p> <p>(cc) Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority.</p> <p>(ee) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans;</p>	<p>Upgrading of access roads infrastructure may necessitate the increase of width and length beyond that of this trigger.</p>

<p>(ii) Areas on the watercourse side of the development setback line or within 100 metres from the edge of a watercourse where no such setback line has been determined; or</p> <p>(f) In Western Cape: All areas outside urban areas:</p> <p>(aa) Areas containing indigenous vegetation;</p>	
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2. FEASIBLE AND REASONABLE ALTERNATIVES

“alternatives”, in relation to a proposed activity, means different means of meeting the general purpose and requirements of the activity, which may include alternatives to—

- (a) the property on which or location where it is proposed to undertake the activity;
- (b) the type of activity to be undertaken;
- (c) the design or layout of the activity;
- (d) the technology to be used in the activity;
- (e) the operational aspects of the activity; and
- (f) the option of not implementing the activity.

Describe alternatives that are considered in this application as required by Appendix 1 (3)(h), Regulation 2014. Alternatives should include a consideration of all possible means by which the purpose and need of the proposed activity (NOT PROJECT) could be accomplished in the specific instance taking account of the interest of the applicant in the activity. The no-go alternative must in all cases be included in the assessment phase as the baseline against which the impacts of the other alternatives are assessed.

The determination of whether site or activity (including different processes, etc.) or both is appropriate needs to be informed by the specific circumstances of the activity and its environment. After receipt of this report the, competent authority may also request the applicant to assess additional alternatives that could possibly accomplish the purpose and need of the proposed activity if it is clear that realistic alternatives have not been considered to a reasonable extent.

The identification of alternatives should be in line with the Integrated Environmental Assessment Guideline Series 11, published by the DEA in 2004. Should the alternatives include different locations and lay-outs, the co-ordinates of the different alternatives must be provided. The co-ordinates should be in degrees, minutes and seconds. The projection that must be used in all cases is the WGS84 spheroid in a national or local projection.

Alternatives should include consideration of all possible means by which the purpose and need of the proposed activity could be accomplished. The no-go alternative must, in all cases, be included in the assessment phase as the baseline against which the impacts of the other alternatives are assessed.

The determination of whether the preferred activity, site or site location is appropriate is informed by the specific circumstances of the proposed development and its environment.

“Alternatives”, in relation to a proposed activity, means different means of meeting the general purpose and requirements of the activity, which may include alternatives to -

- (a) the property on which or location where it is proposed to undertake the activity;
- (b) the type of activity to be undertaken;
- (c) the design or layout of the activity;
- (d) the technology to be used in the activity;
- (e) the operational aspects of the activity; and

(f) the option of not implementing the activity.

One location/ site, various layout alternatives and one technology alternative were identified for assessment as described below.

a) Site alternatives

Location Alternatives

The proposed activity occurs across a number of farm portions and even in their respective local municipalities. Due to it needing to be in close proximity to the proposed Rietkloof WEF, the site or general area does not allow for any location alternatives other than the Rietkloof project area. However, the exact route that the 132kV line takes to reach either the Eskom Komsberg or the Bon Espirange substations allows for alternatives, primarily to avoid environmental sensitivities.

As this proposed project will serve entirely to evacuate energy from the Rietkloof WEF, proximity to the actual wind farm is of vital importance in order to minimise the loss of voltage associated with electricity distribution over longer distances, reduce costs and reduce environmental impacts through limiting the footprint.

Since the site alternative is directly dependent on the WEF location, the WEF site selection process is explained below.

The project proponent has undertaken various extensive processes in order to determine and select the current site location namely Rietkloof wind farm. The process involved integrated feasibility assessments (including spatial, environmental and technical) using a combination of internal tools and external input from third party stakeholders such as consultants, landowners and authorities.

The project area selection process has been considered from the following perspectives:

- National – consideration of the potential development sites from various locations within the borders of South Africa, using predetermined criteria, including environmental, legislative and technical.
- Regional – determination of the suitability of positioning of the site within a chosen locality using evaluative spatial, technical and legal parameters.

A detailed overview of the site selection process is provided below.

National Alternatives

The wind resource is the main determining factor of project success due to the highly competitive nature of the REIPPPP, however environmental and social considerations are also crucial to ensure sustainable development. The applicant therefore identified fourteen areas in South Africa that could potentially have significant wind resources (see Figure 5). These areas were subjected to an environmental and social pre-feasibility assessment that was undertaken by CES during 2009². The high level assessment determined the significance of the environmental and socio-economic issues, potential fatal flaws and to rank the sites.

The pre-feasibility assessment considered the following key factors:

- Visual impact including proximity to scenic areas, sense of place, prevailing land use, areas of conservation or recreational use, topography, proximity to dense settlements and shadow flicker;
- Noise/ acoustic considerations including proximity to existing ambient noise sources and settlements;
- Impacts to avifauna (birds) and bats based on proximity to important bird areas, migratory routes and local bird and bat data;

² Coastal & Environmental Services, (2009b): Pre-Feasibility Assessment for 14 proposed wind energy facility sites in South Africa, CES, Grahamstown.

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- Terrestrial ecology (fauna and flora) assessed in terms of local species and biomes;
- Hydrology impacts in terms of the presence of wetlands and surface water features, potential alterations to watercourses and the associated permit requirements;
- Heritage impacts to local heritage features;
- Road access and power line servitudes;
- Potential safety impact considerations; and
- Proximity to airfields in terms of the restrictions imposed by Civil Aviation Authority (CAA) Regulations.

The pre-feasibility assessment determined that two sites namely Swellendam 2 and Uitvlugt are potentially fatally flawed as indicated in Table 3. Although the other sites had various areas of concern/ risk they were not deemed fatally flawed from an environmental and social perspective.

The applicant proceeded to assess the remaining twelve sites to determine technical feasibility, including:

- Wind resource: Analysis of publicly available information, proprietary information and specialist on-site analysis of weather data to determine the wind resource.
- Site extent to ensure that sufficient land can be secured under long-term lease agreements to allow for a minimum number of wind turbines to make the project feasible.
- Grid access: Grid access and the distance to a viable connection point were key considerations in terms of prioritising appropriate sites. Ease of access into the Eskom electricity grid is vital to the viability of a wind facility. Projects which are in close proximity to a connection point and/or demand centre are favourable, and reduce the losses associated with power transmission.
- Land suitability: The current land use of the site properties was an important consideration for site selection in terms of limiting disruption to existing land use practices. Agricultural land was preferred as the majority of farming practices can continue in tandem to the operation of the wind farm once the construction and commissioning of the project is complete. Sites that facilitate easy construction conditions (relatively flat, limited watercourse crossings, lack of major rock outcrops) were also favoured during site selection.
- Proximity to aerodromes: The proximity to aerodromes and possible interactions with these facilities was considered as part of site selection.
- Landowner support: The selection of sites where the landowners are supportive of the development of renewable energy is essential for ensuring the success of the project.



Figure 5: Overview map of the areas investigated in the pre-feasibility assessment and site selection process.

The applicant proceeded to assess the remaining twelve sites to determine technical feasibility, including:

Table 3: Technical considerations of the sites assessed to be environmentally feasible sites.

Overall Risk Categorisation		
Site	Go / No-go (not necessarily the status quo)	Motivation
Kleinsee	This project was considered a no-go.	The Kleinsee mining area where this site is located was subjected to a tender for land rights with conditions seen technically and financially unfeasible to the developer.
Richtersveld South	This project was considered a no-go.	Unfavourable wind conditions.
Richtersveld North	The applicant proceeded with the development of this site.	All technical and environmental pre-screenings seemed to be favourable.
Lamberts Bay	The applicant proceeded with the development of this site.	All technical and environmental pre-screenings seemed to be favourable. Further wind resource evaluation showed that the site had low wind resources.
Witberg	The applicant proceeded with the development of this site.	All technical and environmental pre-screenings seemed to be favourable.
Beaufort West	This project was considered a no-go.	Unfavourable wind conditions
Sutherland	This project was considered a no-go.	Unfavourable wind conditions
Vredendaal	This project was considered a no-go.	High environmental risk and less favourable wind conditions
Calvinia	This project was considered a no-go.	Limited space and grid connection options for a feasible wind farm.
Klawer	The applicant proceeded with the development of this site.	All technical and environmental pre-screenings seemed to be favourable.

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Struisbay	This project was considered a no-go.	High environmental risks in terms of birds and bats.
Swartbergvlei	This project was considered a no-go.	High environmental risks in terms of birds and bats.

These initial pre-feasibility assessments assisted the developer with forthcoming decisions as to which site alternatives to be prioritised for the development of wind energy facilities. Even though the Roggeveld area per se was not included in this national assessment, the Sutherland site was taken as a proxy regarding environmental risks before environmental impact assessment processes commenced in mid-2010. The final environmental impact assessment report and resulting environmental authorisation in 2014 confirmed that the area had comparatively low environmental sensitivities and that bird and bat risks were actually lower than originally thought for Sutherland.

In addition, the DEA's strategic environmental assessment (SEA) for wind and solar farms identified an area of about 160x60km, centred on Eskom's Komsberg substation, as one of only a few priority areas for wind farm development in South Africa. The SEA itself is based on a large number of environmental and technical criteria and therefore supports the applicant's findings.

Regional Alternatives

Apart from the sites described in Table 3, the applicant also proceeded with researching the greater Roggeveld area. An environmental impact assessment (EIA) process commenced in mid-2010 for a 750MW WEF. Before completing the process, DEA requested that separate EIA processes be undertaken for each 140MW WEF in accordance with the maximum generation capacity per WEF as stipulated under the Department of Energy's Renewable Energy Independent Power Producer Procurement Programme (REIPPPP). The original 750MW project was therefore divided into various phases, each with a potential to generate 140MW.

These detailed environmental impact assessments done as part of the earlier 750MW Roggeveld project lead the developer to believe that there is an acceptable risk of environmental impacts by wind farms in this area. Based on high quality wind measurements conducted since 2010, the wind resource in this area also proved to be exceptionally high, further evidenced by the first phase's ability to bid the lowest tariff (R0.56/kWh) of all wind farm projects in round 4 of the REIPPPP in August 2014. Advanced 3-dimensional wind modelling conducted for an area about 25km around the first phase showed that the surrounding terrain (which includes the Brandvalley site) held very similar, if not better wind potential and therefore was considered to be feasible for further wind farm development.

A number of possible 140MW phases were investigated further. Phase 2, now the Karreebosch wind farm, lies north of the Roggeveld wind farm (phase 1) and obtained environmental authorisation in January 2015. Another two phases, 3 and 4, now referred to as the Brandvalley and Rietkloof wind farms respectively, are currently undergoing their environmental impact assessment process.

As alternatives, a fifth phase located immediately west of the current Rietkloof project site was considered for potential project development, together with areas to the east of Rietkloof. However, all of these alternative sites were considered no-go for wind farm development for reasons described below.

Phase 5 alternative

Phase 5 consisted of the properties immediately west of Rietkloof, up to about 13km away where the terrain falls off into the southern tips of the comparatively flat Tankwa Karoo. According to the applicant's wind map this region

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exhibits even better wind resources than phase 1 (Roggeveld Wind Farm) due to the presence of many elongated mountain ridges which are ideally exposed to the prevailing wind directions. The area was also expected to have similar ecological sensitivities to Roggeveld due to the comparable biophysical environment.

However, this alternative proved infeasible due to the fact that none of the affected landowners were open to the idea of wind energy development on their properties. All further assessments and investigations therefore did not progress any further.

East of Rietkloof alternative

The area due east of the Rietkloof project and the R354 was also considered as an alternative site. After further investigations it was found that this area was not as suitable as the Rietkloof site and therefore discarded for the following reasons:

- Closer proximity to the R354 road and associated higher visual impacts;
- Fewer favourable topographical features with high wind resources - the few exposed ridges which do exist are more isolated and scattered (instead of continuous like at Rietkloof) which would require much more electrical and road infrastructure and therefore would result in a much higher environmental impact; and
- A number of the affected landowners have signed exclusive agreements with the developer's competitors.

Therefore one project location alternative was assessed namely the Rietkloof project area (properties described in Table 2).

Alternative 1 (preferred alternative)		
Description	Lat (DDMMSS)	Long (DDMMSS)
Centre coordinate of the study area	20° 31' 08.51" E	32° 58' 46.89" S

In the case of linear activities:

Please see Appendix A for the various linear layouts for each alternative.

For route alternatives that are longer than 500m, please provide an addendum with co-ordinates taken every 250 meters along the route for each alternative alignment. **PLEASE SEE APPENDIX A FOR THESE COORDINATES.**

In the case of an area being under application, please provide the co-ordinates of the corners of the site as indicated on the lay-out map provided in Appendix A of this form.

b) Lay-out alternatives

Rietkloof Layout Alternatives

At the beginning of this project, various layout (or location) alternatives were discussed. Based on the different substation connection options available to the developer (substation options on-site, as well as destination substations, i.e. Komsberg, shared central Hub Substation or Bon Espirange), the routing of the final distribution line was dependant on the following factors:

1. What the environmental sensitivities indicate regarding the line layout;
2. What the costs involved and practical considerations are for the line layout; and
3. What the technical considerations are regarding the line layout.

Based on the factors listed above, the initially proposed layout alternatives were screened and reduced as discussed below.

1. Initial layout alternatives

At the start of this Basic Assessment (BA) process four alternatives with various sub-alternatives were presented and have since been reduced due to technical and environmental feasibility screening. All the initial four alternatives were assessed by specialists, these alternatives are explained in detail below. Section B presents the alternatives assessed in this BA.

Various alternatives were considered to 1) step up the voltage from 33kV to 132kV (onsite 33/132kV substations), 2) to distribute the 132kV electricity to the grid (overhead distribution line) and 3) various grid connection options.

There are three potential grid connection options considered:

- Komsberg existing 400kV substation;
- Bon Espirange satellite substation that will be constructed as an option for all the wind farms connecting from the West of Komsberg; and
- Rietkloof and Brandvalley Central Hub switching station in case both projects Rietkloof and Brandvalley get awarded preferred bidder at the same time. This option would be an opportunity to share infrastructure and reduce the project footprint. From the switching station there will be one shared 132kV line to either Komsberg or Bon Espirange substation

All three grid connection options above have different sub-alternatives for distribution line routes to connect to the two potential onsite 33/132kV substations as indicated below.

- Substation alternative 1 to:
 - Brandvalley and Rietkloof shared central switching station via one 132kV overhead distribution line from substation 1 (referred to as alternative RK SS1- central switching station)
 - Eskom Komsberg substation via one 132kV overhead distribution line from substation 1 (referred to as alternative RK SS1-Komsberg)
 - Bon Espirange Substation via one 132kV overhead distribution line from substation 1 (referred to as alternative RK SS1- Bon Espirange)
- Substation alternative 2 to:
 - Brandvalley and Rietkloof shared central switching station via one 132kV overhead distribution line from substation 2 (referred to as alternative RK SS2- central switching station)
 - Eskom Komsberg substation via one 132kV overhead distribution line from substation 2 (referred to as alternative RK SS2-Komsberg)
 - Bon Espirange Substation via one 132kV overhead distribution line from substation 2 (referred to as alternative RK SS2- Bon Espirange)
- Substation alternative 3 to:
 - Brandvalley and Rietkloof shared central switching station via one 132kV overhead distribution line from substation 3 (referred to as alternative RK SS3- central switching station)
 - Eskom Komsberg substation via one 132kV overhead distribution line from substation 3 (referred to as alternative RK SS3-Komsberg)
 - Bon Espirange Substation via one 132kV overhead distribution line from substation 3 (referred to as alternative RK SS3- Bon Espirange)
- Substation alternative 4 to:
 - Brandvalley and Rietkloof shared central switching station via one 132kV overhead distribution line from substation 4 (referred to as alternative RK SS4- central switching station)
 - Eskom Komsberg substation via one 132kV overhead distribution line from substation 4 (referred to as alternative RK SS4-Komsberg)
 - Bon Espirange Substation via one 132kV overhead distribution line from substation 4 (referred to as alternative RK SS4- Bon Espirange)

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- Substation alternative 5 to:
 - Brandvalley and Rietkloof shared central switching station via one 132kV overhead distribution line from substation 5 (referred to as alternative RK SS5- central switching station)
 - Eskom Komsberg substation via one 132kV overhead distribution line from substation 5 (referred to as alternative RK SS5-Komsberg)
 - Bon Espirange Substation via one 132kV overhead distribution line from substation 5 (referred to as alternative RK SS5- Bon Espirange)
- Substation alternative 6 to:
 - Brandvalley and Rietkloof shared central switching station via one 132kV overhead distribution line from substation 6 (referred to as alternative RK SS6- central switching station)
 - Eskom Komsberg substation 132kV overhead distribution line from substation 6 (referred to as alternative RK SS6-Komsberg)
 - Bon Espirange Substation via one 132kV overhead distribution line from substation 6 (referred to as alternative RK SS6- Bon Espirange)
- Substation alternative 7 to:
 - Brandvalley and Rietkloof shared central switching station via one 132kV overhead distribution line from substation 7 (referred to as alternative RK SS7- central switching station)
 - Eskom Komsberg substation via one 132kV overhead distribution line from substation 7 (referred to as alternative RK SS7-Komsberg)
 - Bon Espirange Substation via one 132kV overhead distribution line from substation 7 (referred to as alternative RK SS7- Bon Espirange)

Each of these distribution line alternatives will be buffered by 100m on either side (200m wide corridor) in order to allow for micro-siting. Although numerous alternatives are considered, only one 33/132kV substation and one 132kV overhead power line will be built to connect to one grid connection option per project. A second substation (central hub station) may be constructed should both WEFs be allocated preferred bidder status as mentioned above, subject to appropriate environmental authorisations.

The electrical infrastructure is mentioned in a number of EIA and BA processes for Brandvalley and Rietkloof WEFs which are relevant to the outcome of this BA, however please note that the following infrastructure was assessed in this BA process only:

- The high voltage 132kV Eskom yard for the onsite substations were assessed in this BA as it will be ceded to Eskom. The low voltage 33kV IPP yard will be assessed in the EIA. The exact split between the low voltage and high voltage cannot be confirmed at the time of writing, but both yards will be within the 200 x 200m area (40 000m²).

Therefore, seven potential onsite 33/132kV substations, various 132kV distribution line corridors and three grid connection alternatives were initially assessed by all specialists (see Appendix D).

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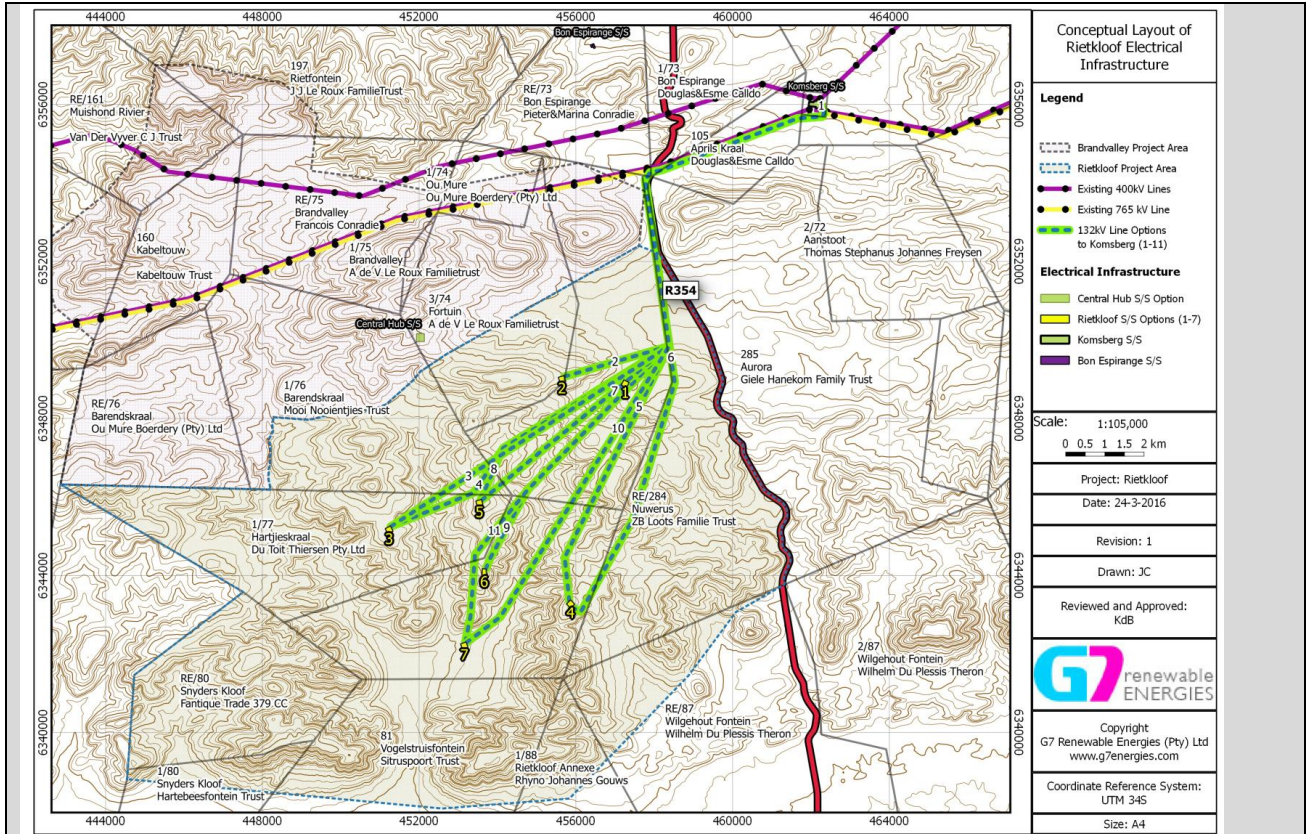


Figure 6: Preliminary Layout of Electrical infrastructure and footprint for alternative B – Komsberg Substation, including alternatives.

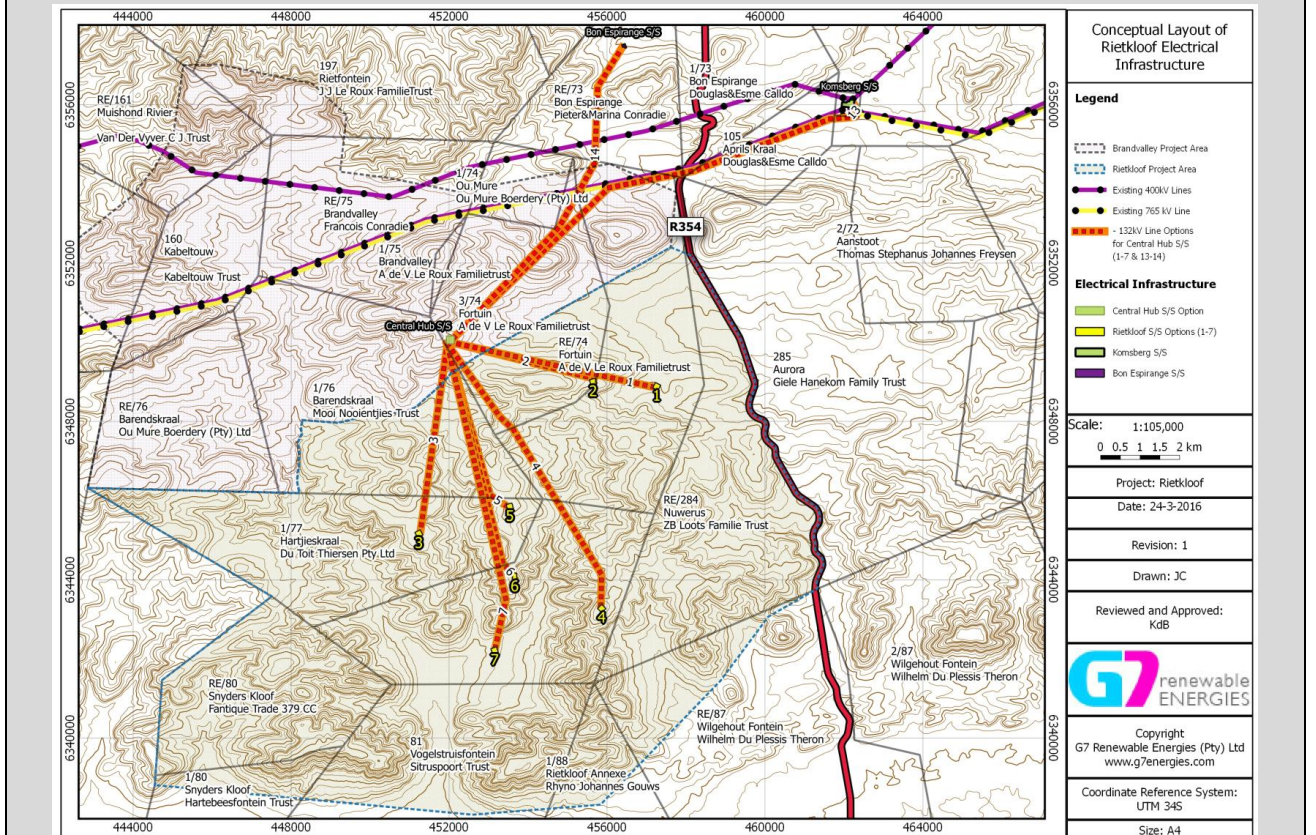


Figure 7: Preliminary Layout of Electrical infrastructure and footprint for alternative C – Central Hub Substation, including alternatives.

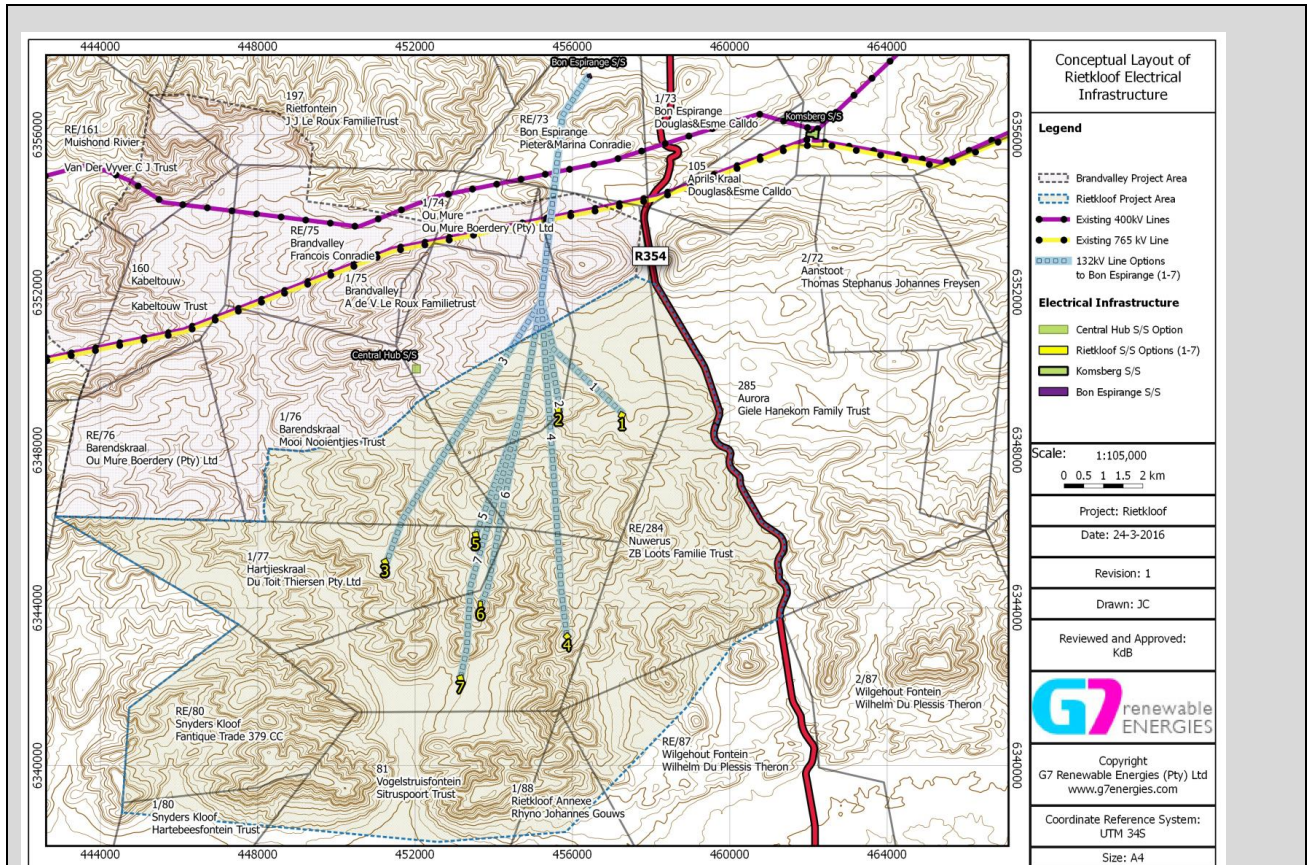


Figure 8: Preliminary Layout of Electrical infrastructure and footprint for alternative A – Bon Espirange Substation, including alternatives.

2. Alternatives for assessment in this BA (excluding screened out options):

Subsequent to the specialist assessments, as well as technical and economic considerations by the applicant, the seven 132kV onsite substation alternative positions and the associated distribution lines were screened out and reduced. Strings of turbines are connected with substations through overhead and underground cabling. The longer the distance, the more electrical losses are expected. The less electrical losses a park experience the more electricity can be fed into the national grid. A high-level technical assessment was undertaken to determine the expected losses for each substation alternative. After considering many technical factors, substation positions 1,2, 3, 4 and 7 were screened out. The annual electrical losses were the highest at these locations compared to positions 5 and 6. Therefore, substation positions 1,2, 3, 4 and 7 were technically least preferred and screened out from a technical point of view. There were no fatal flaws associated with substation positions 5 and 6 apart from recommendations to move the infrastructure outside of the relevant buffer zones. Certain onsite 132kV substation positions were therefore screened out and are no longer considered in this application; Only onsite substation positions number 5 and 6 are assessed and included in this application.

All three grid connection options initially proposed, are assessed in this BA report, namely Alternative A: connections to Bon Espirange Substation; Alternative B: connections to Komsberg Substation; and Alternative C: connections via the central hub substation.

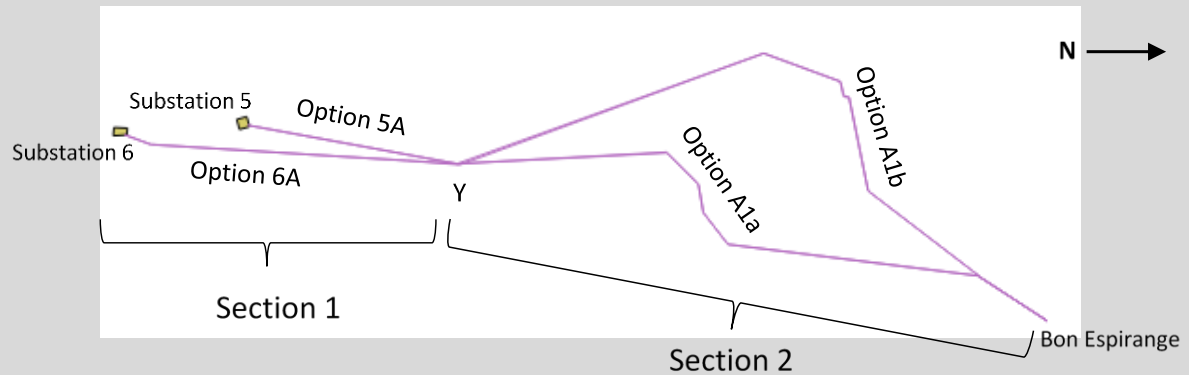
Each alternative (Alternative A, B and C) have different sub-alternatives (route options within each alternative) for distribution line routes to connect to one of the two potential onsite 132kV substations as indicated below.

Alternative A

Alternative A has 2 section route options to the Bon Espirange substation. Alternative A was analysed in 2 sections. Section 1 and Section 2.

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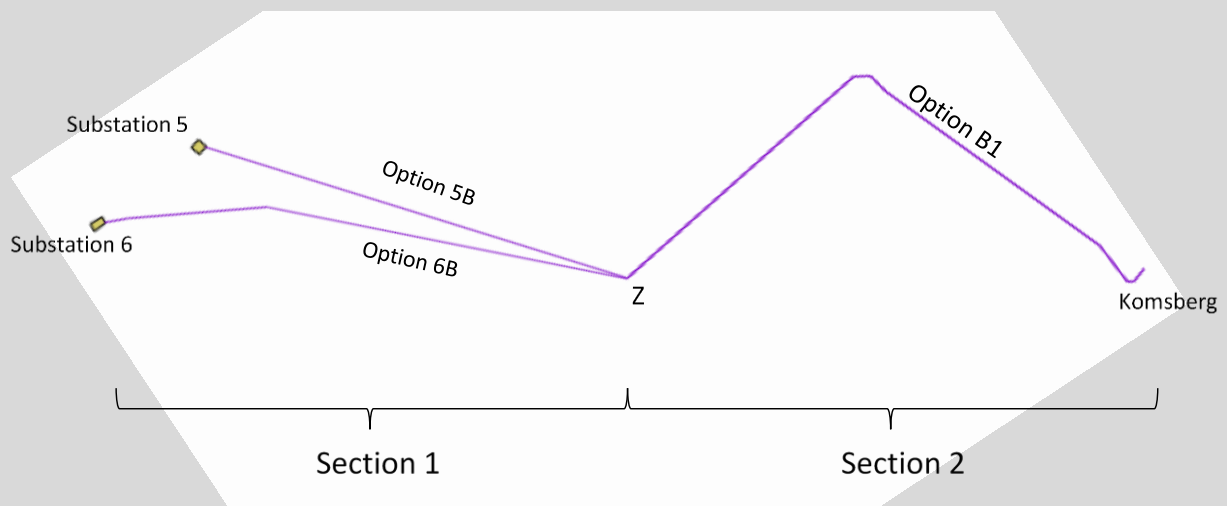
- Section 1 will discuss the two route options: Option 5A and Option 6A.
 - Option 5A starts at Substation 5 and ends at Point Y.
 - Option 6A starts at Substation 6 and ends at Point Y.
- Section 2 will discuss the two route options: Option A1a and Option A1b.
 - Option A1a starts at Point Y and heads east ending at the Bon Espirange Substation.
 - Option A1b starts at Point Y and heads west ending at the Bon Espirange Substation.



Alternative B

Alternative B has two route options (Option 5B/ Option 6B) to reach point Z where the line will follow Option B1 to the Komsberg substation. Alternative B was analysed in 2 sections. Section 1 and Section 2.

- Section 1 will discuss the two route options:
 - Option 5B and Option 6B. Option 5B starts at Substation 5 and ends at Point Z.
 - Option 6B starts at Substation 6 and ends at Point Z.
- Section 2 will discuss the route from Point Z to the Komsberg Substation.



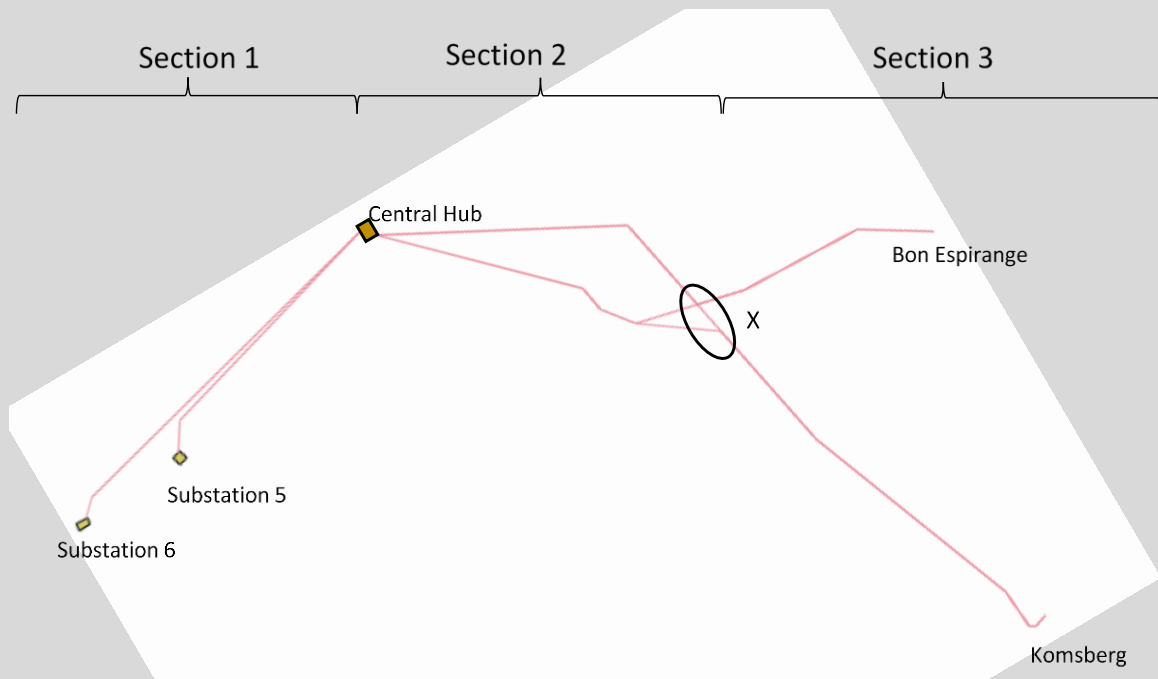
Alternative C

Alternative C is the alternative that would be chosen should both the Rietkloof WEF and Brandvalley WEF (directly to the north) be authorized for development. This alternative has been included in this BA to illustrate the line path to the central hub and from the central hub to either the Bon Espirange or Komsberg Substation. Alternative C illustrates a number of route options. All options pass through the Central Hub. Alternative C was analyzed in three sections: Section 1, Section 2 and Section 3.

- Section 1 will discuss the route options from substation 5 and substation 6 to the Central hub.

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- Section 2 will discuss the route options from the central hub to point X.
- Section 3 will discuss the route options from point X to Bon Espirange Substation and Komsberg Substation.



Each of these routes will be buffered by a 100m buffer (on each side) in order to allow for micro-siting. **Although numerous alternatives have been considered, only one 132kV substation and one 132kV overhead power line will be constructed in order to connect to one of the grid connection options above.** Ancillary infrastructure required will be access service roads, pylon foundations and the power line servitude itself, along with the substation components.

This particular application thus involves the final selection and authorisation application for one 132kV on-site substation, with above-ground distribution lines, connected to either the shared central hub substation, the Eskom Bon Espirange substation or the Eskom Komsberg Substation, inclusive of ancillary infrastructure. **IMPORTANT NOTE: A preferred layout alternative is selected further in the remainder of this document.**

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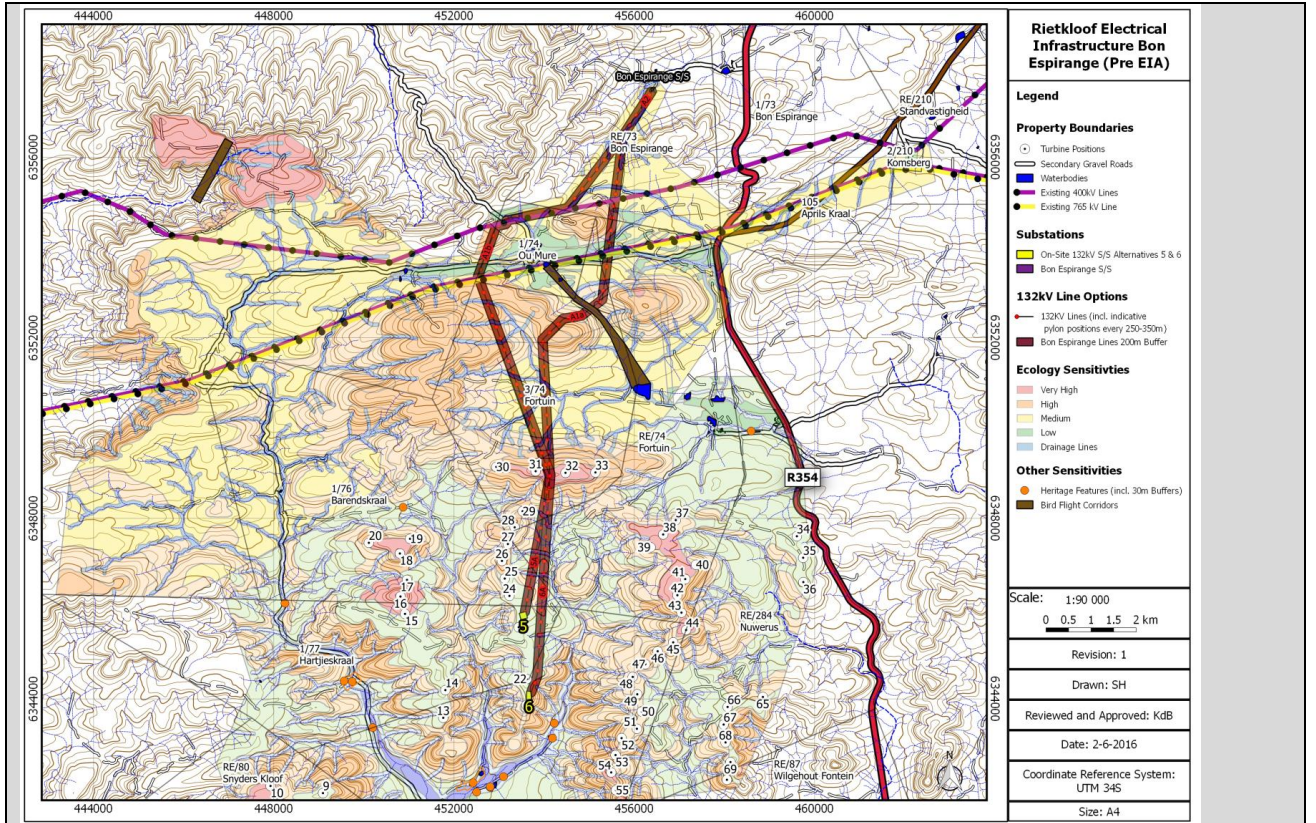


Figure 9: Alternative A- Electrical infrastructure and footprint from Substation 5 or Substation 6 to Bon Espirange Substation.

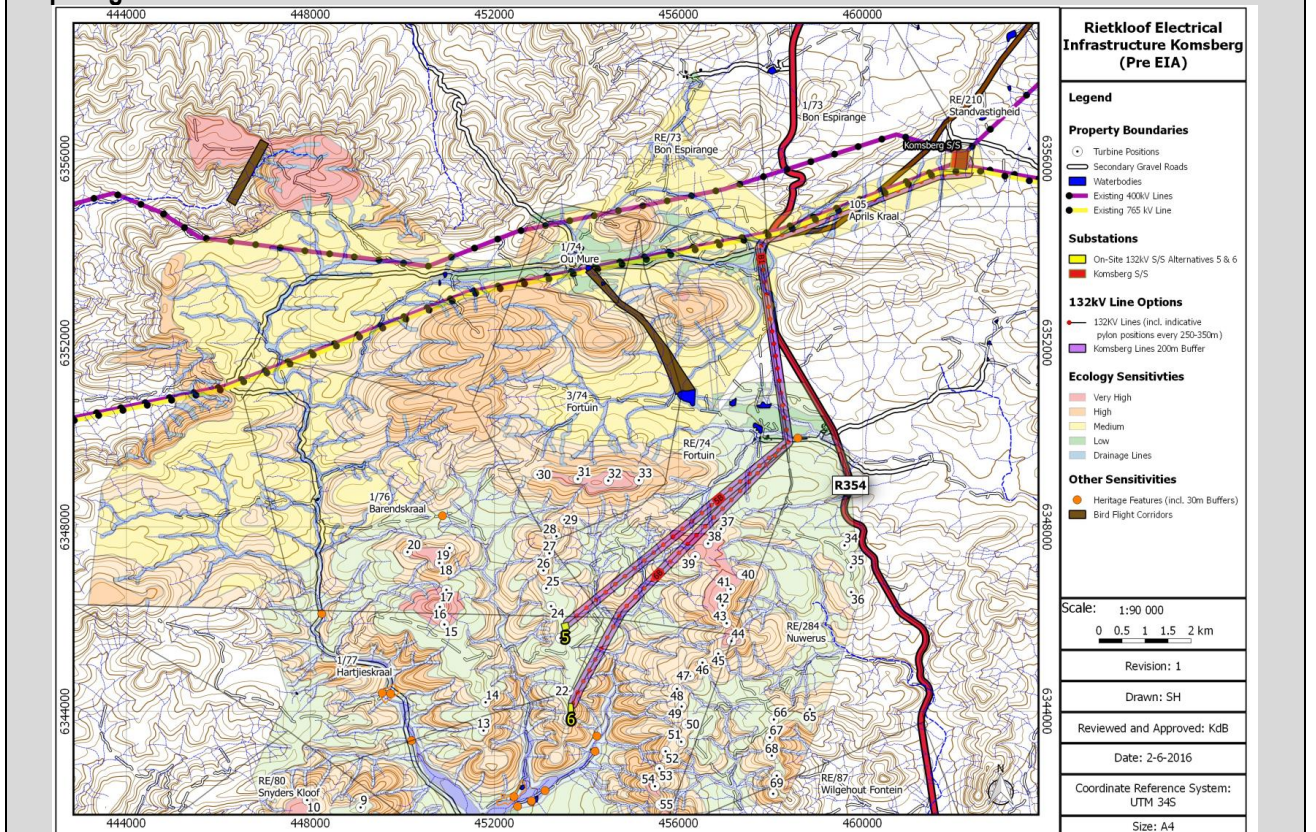


Figure 10: Alternative B - Electrical infrastructure and footprint for alternative from Substation 5 or Substation 6 to the Komsberg Substation.

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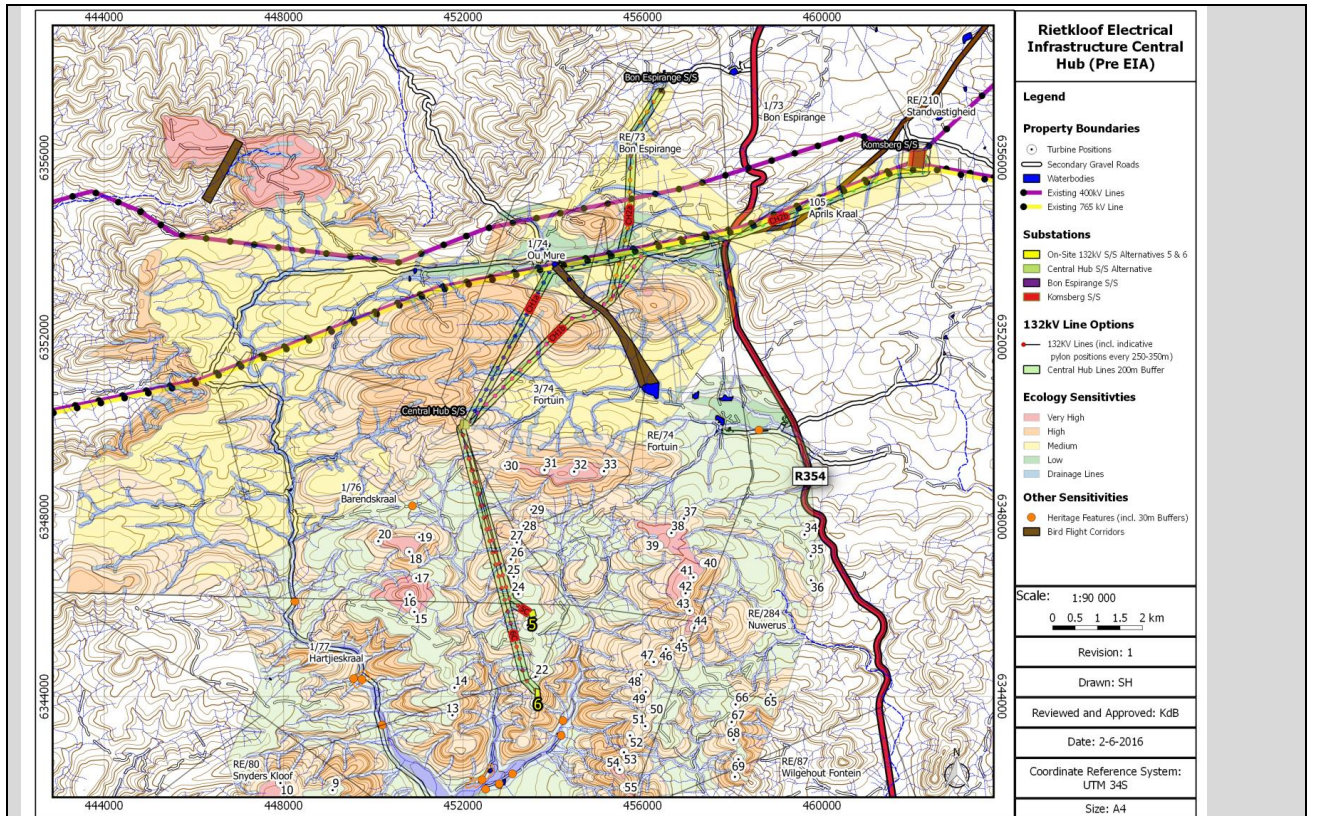


Figure 11: Alternative C- Electrical infrastructure and footprint for alternative from Substation 5 or Substation 6 to the Central Hub Substation and then from the Central Hub to either Bon Espirange or Komsberg

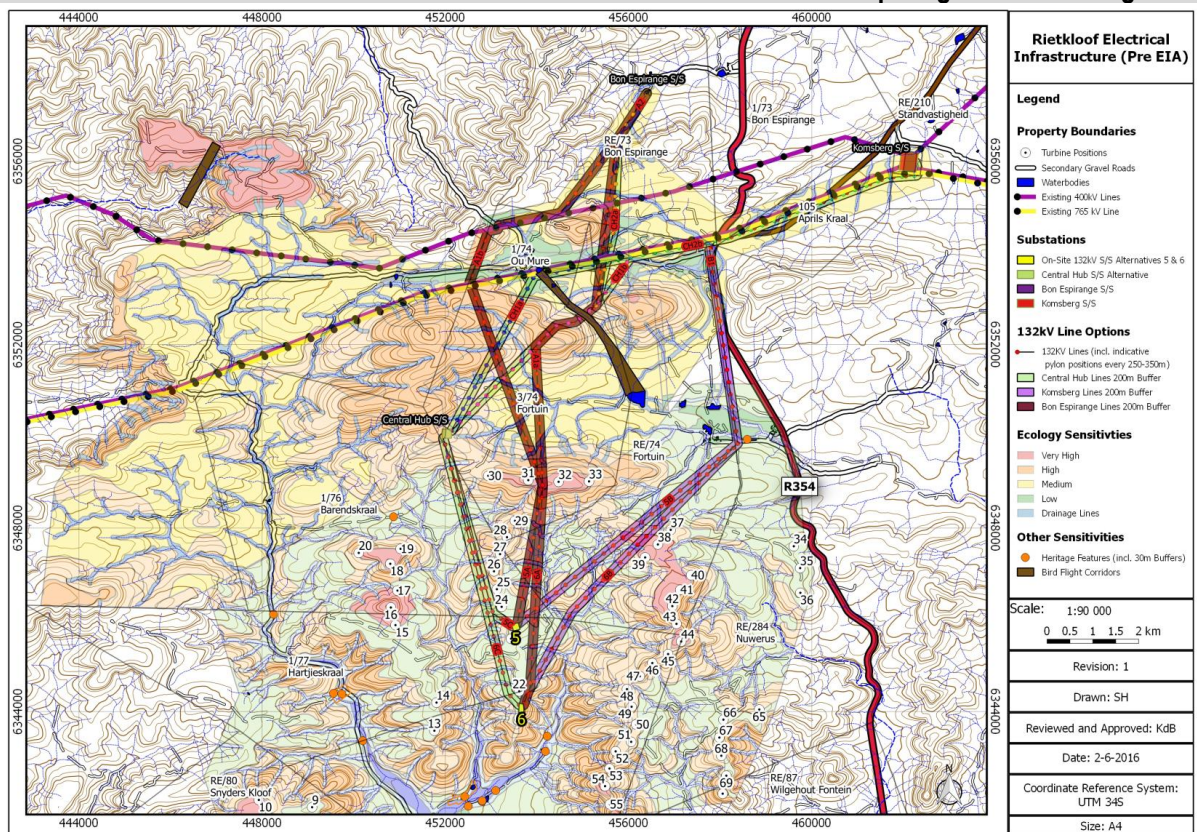


Figure 12: Electrical infrastructure and footprint for all alternatives assessed in this Basic Assessment process.

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Please find larger versions of the above four maps in Appendix A for clarity. Please see Appendix A for coordinates of the four corner points as well as coordinates of each bend point.

Please see Appendix A for coordinates of the layout alternatives.

c) Technology alternatives

One technology alternative was assessed; namely distribution of electricity via an overhead 132kV powerline. Underground distribution lines would require extensive trenching which would impact the environment. It is also costlier to construct and undertake maintenance. The line design will depend predominantly on the design requirements from Eskom. If approved, the line will in all likelihood be a combination of single and double circuit. There is therefore only one technology alternative available that are economically, environmentally and socially feasible.

Alternative 1 (preferred alternative)
Overhead 132kV combination of single and double circuit distribution line, as complies with Eskom requirements.
Alternative 2
No other alternative assessed beyond that of the preferred.
Alternative 3
No other alternative assessed beyond that of the preferred.

d) Other alternatives (e.g. scheduling, demand, input, scale and design alternatives)

Alternative 1 (preferred alternative)
No other alternatives were considered.

e) No-go alternative

No-go alternative

The no development alternative in the context of this project implies that the distribution line and substation would not be constructed and the current land use namely agriculture would persist. If the project does not proceed the negative impacts such as risk of collisions of birds, clearing of vegetation and soil erosion would be avoided.

However if the project does not commence the project would not be able to feed the electricity generated by the proposed WEF to the national grid. Short term economic stimulus through an influx of people into the nearby towns as well as the creation of short term local jobs will also not be realised. The need to for stable and reliable power supply to meet current and future demand will likely outweigh the potential impacts to the surrounding environment, which is expected to be of low to medium significance, at best, and can be proactively mitigated to an acceptable level. Since the current agricultural activities can continue regardless of whether this application is authorised or not, the no-go alternative is not recommended.

f) Summary of alternatives assessed in this report

The following alternatives were assessed in this Basic Assessment report:

Alternatives	
Location alternative	Rietkloof project area in close proximity to the proposed Rietkloof WEF
Layout alternatives	Alternative A- connection to Bon Espirange Substation: <ul style="list-style-type: none"> ○ Substation 5 via one 132kV overhead distribution line to Bon Espirange Substation (referred to as alternative 5A via A1b). ○ Substation 6 via one 132kV overhead distribution line to Bon Espirange

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	<p>Substation (referred to as alternative 6A via A1a).</p> <p>Alternative B- connection to Komsberg Substation:</p> <ul style="list-style-type: none"> ○ Substation 5 via one 132kV overhead distribution line to Komsberg Substation (referred to as alternative 5B via B1). ○ Substation 6 via one 132kV overhead distribution line to Komsberg Substation (referred to as alternative 6B via B1). <p>Alternative C- connection to Central Hub Substation:</p> <ul style="list-style-type: none"> ○ Substation 5 via one 132kV overhead distribution line to Central Hub Substation (referred to as alternative 5C). ○ Substation 6 via one 132kV overhead distribution line to Central Hub Substation (referred to as alternative 6C). ○ Central Hub Substation alternative to Bon Espirange Substation: <ul style="list-style-type: none"> ▪ Central Hub via one of two 132kV overhead distribution line route options (referred to as alternative CH1A or CH2a) to Bon Espirange Substation. ○ Central Hub Substation alternative to Komsberg Substation: <ul style="list-style-type: none"> ▪ Central Hub via one of two 132kV overhead distribution line route options (referred to as alternative CH1B or CH2b) to Komsberg Substation.
Technology alternatives	One technology alternative being overhead transmission of electricity via a 132kV distribution line.
No-Go alternative	Option of not developing the proposed electrical infrastructure.

Please see maps in Appendix A for visual presentation of these alternatives.

Paragraphs 3 – 13 below should be completed for each alternative.

3. PHYSICAL SIZE OF THE ACTIVITY

a) Indicate the physical size of the preferred activity/technology as well as alternative activities/technologies (footprints):

Location Alternative:

Alternative A1³ (preferred activity alternative)

Alternative A2 (if any)

Alternative A3 (if any)

Size of the activity:

24100ha- all properties involved
m ²
m ²

or, for linear activities:

Alternative:

5A via A1b (preferred activity alternative)

alternative 6A via A1a

alternative 5B via B1

alternative 6B via B1

alternative 5C

alternative 6C

Central hub through alternative CH1a to Bon Espirange

Length of the activity:

13845m
14355m
1 5720m
16958m
4607m
6220m
5785m

³ "Alternative A.." refer to activity, process, technology or other alternatives.

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Central hub through alternative CH1b through CH2a to Bon Espirange	10768m
Central hub through alternative CH1a through CH2b to Komsberg	13158m
Central hub through alternative CH1b through CH2b to Komsberg	13277m

b) Indicate the size of the alternative sites or servitudes (within which the above footprints will occur):

Alternative:

Alternative A1 (preferred activity alternative)

Alternative A2 (if any)

Alternative A3 (if any)

Size of the site/servitude:

See layout alternative above
None available m ²
None available m ²

4. SITE ACCESS

Does ready access to the site exist?

If NO, what is the distance over which a new access road will be built

YES	
	0 m

Describe the type of access road planned:

The project area can be accessed via the R354 that connects to the N1 between Matjiesfontein and Laingsburg. The R354 is the main arterial road providing access to the project area. There are a number of existing gravel roads providing access from the R354. From the R354, the proposed project area can be accessed via existing or previously authorised roads in the area

Service roads up to 6m wide will be required along the servitude to allow for construction and maintenance of the distribution line. Where possible, the service road will overlap with the roads proposed for the WEF.

5. LOCALITY MAP

An A3 locality map must be attached to the back of this document, as Appendix A. The scale of the locality map must be relevant to the size of the development (at least 1:50 000. For linear activities of more than 25 kilometres, a smaller scale e.g. 1:250 000 can be used. The scale must be indicated on the map.). The map must indicate the following:

- an accurate indication of the project site position as well as the positions of the alternative sites, if any;
- indication of all the alternatives identified;
- closest town(s);
- road access from all major roads in the area;
- road names or numbers of all major roads as well as the roads that provide access to the site(s);
- all roads within a 1km radius of the site or alternative sites; and
- a north arrow;
- a legend; and
- locality GPS co-ordinates (Indicate the position of the activity using the latitude and longitude of the centre point of the site for each alternative site. The co-ordinates should be in degrees and decimal minutes. The minutes should have at least three decimals to ensure adequate accuracy. The projection that must be used in all cases is the WGS84 spheroid in a national or local projection).

6. LAYOUT/ROUTE PLAN

A detailed site or route plan(s) must be prepared for each alternative site or alternative activity. It must be attached as Appendix A to this document.

The site or route plans must indicate the following:

- the property boundaries and numbers of all the properties within 50 metres of the site;
- the current land use as well as the land use zoning of the site;
- the current land use as well as the land use zoning each of the properties adjoining the site or sites;
- the exact position of each listed activity applied for (including alternatives);
- servitude(s) indicating the purpose of the servitude;
- a legend; and
- a north arrow.

7. SENSITIVITY MAP

The layout/route plan as indicated above must be overlain with a sensitivity map that indicates all the sensitive areas associated with the site, including, but not limited to:

- watercourses;
- the 1:100 year flood line (where available or where it is required by DWS);
- ridges;
- cultural and historical features;
- areas with indigenous vegetation (even if it is degraded or infested with alien species); and
- critical biodiversity areas.

The sensitivity map must also cover areas within 100m of the site and must be attached in Appendix A.

8. SITE PHOTOGRAPHS

Colour photographs from the centre of the site must be taken in at least the eight major compass directions with a description of each photograph. Photographs must be attached under Appendix B to this report. It must be supplemented with additional photographs of relevant features on the site, if applicable.

9. FACILITY ILLUSTRATION

A detailed illustration of the activity must be provided at a scale of at least 1:200 as Appendix C for activities that include structures. The illustrations must be to scale and must represent a realistic image of the planned activity. The illustration must give a representative view of the activity.

The final design of the electrical infrastructure has not been undertaken. Therefore, standard Eskom designs and images were provided of both monopole and lattice pylon structures. The information provided is for illustration purposes only as the design will only be undertaken post-EIA.

10. ACTIVITY MOTIVATION

Motivate and explain the need and desirability of the activity (including demand for the activity):

1. Is the activity permitted in terms of the property's existing land use rights?	NO	Please explain
The majority of the land within the project area is currently zoned for agricultural purposes, with the exception of the existing 400kV servitude and 765kV servitude for the Eskom distribution line running just north of the		

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project region. There's no current permits in place for the onsite substations, overhead distribution lines or the central hub substation. Once the 132kV distribution line is finalised a servitude would be registered.

The Bon Espirange Substation was previously authorised (DEA Ref Number: 12/12/20/1988/1/AM1) The proposed activity is therefore permitted in terms of the property's land use rights. The Komsberg footprint is zoned for authority zone and is therefore permitted in terms of the property's current land use rights

2. Will the activity be in line with the following?

(a) Provincial Spatial Development Framework (PSDF)	YES		Please explain
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According to the Northern Cape PSDF⁴, one goal of the PSDF is to ensure and promote Economic Efficiency within the province. This is understood as the optimisation of benefit at the lowest cost. It includes the innovative and efficient use of available resources. The evacuation of energy from this project will allow for greater energy availability throughout the country, allowing for greater consumption and stimulation of the economy. The NCPSTDF furthermore stresses the importance of the renewable energy sector to promote economic opportunity within the province. In addition, the plan also calls for close co-operation between the public and private sectors to improve economic development.

The Western Cape provincial spatial development framework⁵ further targets the renewable energy sector as one key growth sector for the province, of which this development will form part of, recognising the need for support and encouragement for Independent Power Producers. Through these sorts of statements it is clear that the PSDF includes sustainable renewable energy development within the province.

(b) Urban edge / Edge of Built environment for the area	NO		Please explain
--	-----------	--	----------------

The project area is located between Matjiesfontein and Sutherland within the Central Karoo and Namakwa District Municipalities. The site does not fall within the urban edge and will not impact on the urban edge in any way.

(c) Integrated Development Plan (IDP) and Spatial Development Framework (SDF) of the Local Municipality (e.g. would the approval of this application compromise the integrity of the existing approved and credible municipal IDP and SDF?).	YES		Please explain
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By virtue of the fact that this project will be evacuating power generated by the Rietkloof WEF, the need and desirability of the power line extends from that of the Wind Farm. Should the wind farm not be authorised, there will be no need for this project, however, should this project not proceed, the wind farm will have no means of evacuating the power produced. As such, this project's need and desirability is inextricably linked to that of the associated Rietkloof WEF. The following thus applies to this project as well as the WEF:

Local Planning Guide	Relevance
Central Karoo District Municipality (CKDM) IDP (2012-2017)	The CKDM IDP promotes sustainability through the integration of social, economic and ecological components. The planning document highlights the increasing importance of sustainable energy, emphasising the national vision to focus on renewable energy as a movement towards less carbon-intensive electricity production. The CKDM IDP and SDF make provision for wind farms within the Central Karoo as an alternative energy source.

⁴ Northern Cape Provincial Spatial Development Framework 2012. NCPSTDF Final Document - 22 August 2012 (25 MB) [online]. Available from http://northerncapepsdf.co.za/wp-content/uploads/Northern_Cape_PSDF_22_August_2012.pdf [Accessed 25 May 2016].

⁵ Western Cape Provincial Spatial Development Framework 2014. Western Cape Provincial Spatial Development Framework [online]. Available from https://www.westerncape.gov.za/eadp/sites/eadp.westerncape.gov.za/files/your-resource-library/2014%20Provincial%20Spatial%20Development%20Framework%20%28PSDF%29_0.pdf] Accessed 25 May 2016.

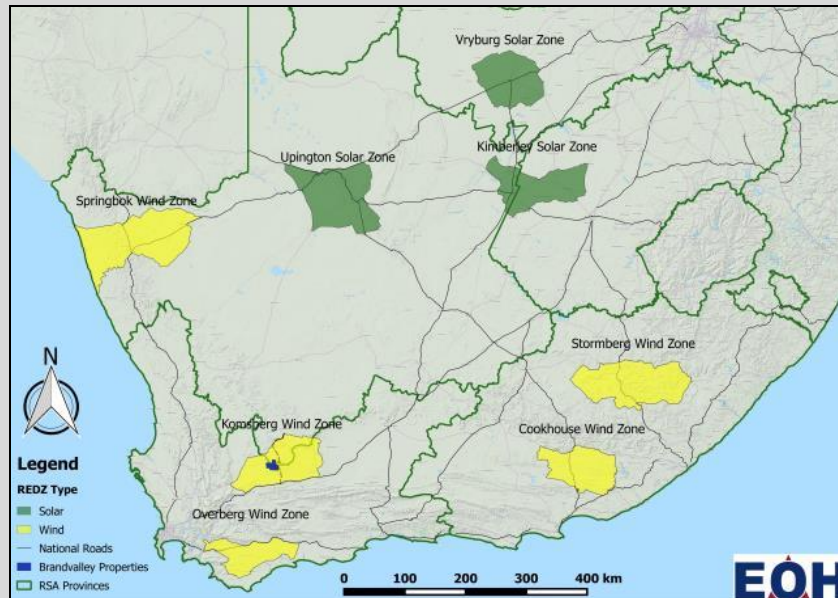
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<p>Namakwa District Municipality (NDM) IDP (2012-2016)</p>	<p>The NDM commits to sustainable development and the transition to a low-carbon economy through the expansion of renewable energy. The IDP calls for the development and implementation of a Renewable Energy Strategy to achieve their infrastructure objectives.</p> <p>Although such a strategy is not in place, the establishment of a 140MW WEF are in line with the commitment to move towards a low-carbon economy by increasing renewable energy generation capacity.</p>
<p>Laingsburg Local Municipality (LLM) IDP (2012/2017)</p>	<p>The key strategies proposed by the LLM IDP within the Strategic Infrastructure and the Environmental and Spatial Development approaches include the support and promotion of wind, solar and bio-gas developments as a source of alternative energy.</p>
<p>Karoo Hoogland Local Municipality IDP (2015-2016)</p>	<p>The mission statement of the Karoo Hoogland LM IDP is to provide leadership on environmental sustainability and climate change response. The Environmental and Spatial Analysis includes the promotion and diversification of renewable energy projects in accordance with the Integrated Resource Plan (IRP) for Electricity 2010-2030 in addition to the creation of job opportunities through the Green Economy.</p>
<p>(d) Approved Structure Plan of the Municipality</p>	<p style="text-align: center;">YES [REDACTED] Please explain</p>
<p>All the municipalities are aware of the ongoing authorisation application for the Rietkloof WEF and were notified of this Basic Assessment process. Should the WEF project succeed, the development of a distribution line would be required. The proposed substation and distribution line feeding into the grid connection options support this project and do not compromise the structure of the municipal plan.</p>	
<p>(e) An Environmental Management Framework (EMF) adopted by the Department (e.g. Would the approval of this application compromise the integrity of the existing environmental management priorities for the area and if so, can it be justified in terms of sustainability considerations?)</p>	<p style="text-align: center;">YES [REDACTED] Please explain</p>
<p>There are no EMF that exists for the project region.</p> <p>The Central Karoo IDP⁶ calls for the development of renewable energy sources as a means of securing greater energy supply for current and future needs. Renewables such as solar and wind are thus prioritised, to which this development will contribute.</p>	
<p>(f) Any other Plans (e.g. Guide Plan)</p>	<p style="text-align: center;">YES [REDACTED] Please explain</p>
<p>The Strategic Environmental Assessment (SEA) for wind and solar PV energy in South Africa (CSIR, 2013⁷) supports of the Strategic Integration Project (SIP) 8 which focuses on the implementation of sustainable green energy initiatives. The SEA integrates environmental, economic and social factors to identify eight (8) Renewable Development Zones (REDZs). The identified REDZs included areas where large scale wind energy facilities can be developed in a manner that limits significant negative impacts on the environment while yielding the highest possible socio-economic benefits to the country. The SEA process and the determination of the REDZs provided an opportunity for government authorities, the private sector and the public to provide input and agree on appropriate development areas. The SEA additionally identified priority areas for investment opportunities into the electricity grid, providing a solution to the current limitations of existing grid infrastructure and the challenges faces in expanding the grid. The proposed Rietkloof WEF and this associated and necessary infrastructure thus falls within the Komsberg Wind REDZ. The REDZs are considered areas of the highest development potential on land that is technically suitable for wind and solar</p>	

⁶ Central Karoo IDP 2014. Central Karoo Integrated Development Plan [online]. Available from <https://www.westerncape.gov.za/text/2012/11/central-karoo-dm-idp-2012-2017.pdf> [Accessed 25 May 2016].

⁷ CSIR. (2013). Strategic Environmental Assessment for wind and solar PV energy in South African – Renewable Energy Development Zones (REDZs). Available: <https://redzs.csir.co.za/>. (Accessed: 11/01/2016).

developments. Proposed projects that fall within these areas are thus incentivised and streamlined. Cabinet approved the gazetting of REDZs on 17 February 2016⁸.



There are other wind energy developments and electrical infrastructure proposed and existing in close proximity to the Ritekloof WEF. These facilities are in various stages of development ranging from application phase to authorisation (environmental authorisation and preferred bidder). Although each location has its own wind patterns, the close proximity of wind farms in an area does have environmentally preferred advantages such as limiting certain impacts to that location as opposed to impacting a number of areas. It also confirms the region/locality as a high wind resource and a suitable area for renewable energy development.

Furthermore, there are Eskom high voltage transmission lines (one 786kV and two 400kV power lines) running immediately south of the project area, running between the Komsberg station and the Kappa substation.

The recently built 765kV line runs from the Gamma substation near Victoria West past the Kappa substation near Touwsriver (southwest of the project site) to connect to the Omega substation near Koeberg. This is part of Eskom's grid strengthening project for power transmission and distribution in South Africa. The Komsberg capacitor station located northeast of the project site has two 400 kV lines running through its capacitor banks from the Droerivier substation to the Bacchus and Muldersvlei substations, respectively, via the Kappa substation. The approved renewable energy projects located in the vicinity are intended to be connected to the Komsberg or Kappa substations. The Komsberg substation will be upgraded to connect more projects to the grid.

Compatibility of the REDZ and the Western Karoo National Protected Areas Expansion Strategy (as per comment from DEA):

The proposed WEF is located in an area where the Komsberg Renewable Energy Development Zone overlaps with the Western Karoo NPAES focus area which are both areas identified through broad scale planning. The closest protected area to the proposed site is the Anysberg Nature Reserve. The goal of NPAES is to achieve cost-effective protected area expansion for ecological sustainability and increased resilience to climate change. The document does not list conflicting land uses.

The strategic planning goals of the REDZ are to earmark areas where large scale wind and solar PV energy

⁸ South African Government, 2016. <http://www.gov.za/speeches/statement-cabinet-meeting-17-february-2016-18-feb-2016-0000>.

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facilities can be developed in a manner that limits the potential for significant negative impact on the natural environment, while yielding the highest possible social and economic benefits to the country. These REDZs were identified to support the Strategic Infrastructure Plan (SIP) 8 of the National Infrastructure Plan.

Increased Renewable Energy development in South Africa indirectly supports sustainability and increased resilience to climate change as it reduces reliance on coal-fired power generation.

On a local scale, the development footprint of 246km² (project area of both Brandvalley and Riektloof) amounts to a fraction of the total Western Karoo NPAES area. Of the 246km² the actual footprint of the WEF and electrical infrastructure would only be approximately 200ha.

The ecologist assessed the impact of the development on the NPAES Focus Area, and determined that the total extent of habitat lost to the current development is not highly significant and would not compromise the overall availability of land to meet conservation goals within the affected NPAES.

Additionally:

1. Based on the mapping information there is no continuity between the expansion focus area and the nature reserve.

2. It is important to note that the focus areas do not preclude development from occurring in these areas. As stated in the BGIS information sheet, "These areas should not be seen as future boundaries of protected areas, as in many cases only a portion of a particular focus area would be required to meet the protected area targets set in the NPAES." Only a portion of the NPAES in this area is affected by the proposed development, thus still allowing for expansion should this be required.

3. It is important to note that the proposed development footprint is small and limited to the sites for substations and pylons for overhead lines, thus still allowing for ecological connectivity and thus can still be used for conservation purposes.

4. The SEA undertaken for the REDZ did take environmentally sensitive areas into account in order to "identify areas where large scale wind and solar PV energy facilities can be developed in a manner that limits significant negative impacts on the environment, while yielding the highest possible socio-economic benefits to the country".

Therefore, it is concluded that on a local scale the REDz and NPAES Focus Areas are compatible.

3. Is the land use (associated with the activity being applied for) considered within the timeframe intended by the existing approved SDF agreed to by the relevant environmental authority (i.e. is the proposed development in line with the projects and programmes identified as priorities within the credible IDP)?

YES

Please explain

Although the specific project is not considered in the SDF, the broader region surrounding the project area has been specifically earmarked for development of solar and onshore wind projects, under the auspices of the REIPPP Programme. As such, this project (and the land use it represents) is in agreement with the development goals of the IDP.

4. Does the community/area need the activity and the associated land use concerned (is it a societal priority)? (This refers to the strategic as well as local level (e.g. development is a national priority, but within a specific local context it could be inappropriate.)

YES

Please explain

Electricity provision in South Africa is currently a critical issue, and has direct impact on the economic growth of the country, as South Africa is an energy intensive economy. The project region is currently being serviced sufficiently through the existing electrical infrastructure. However, there's a big need for employment opportunities which this project along with the WEF will respond to. An immediate local benefit in terms of

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<p>electricity supply is not expected, however, short term increase in locally sourced labour from the construction activities associated with the electrical infrastructure and a significant increase in employment opportunities associated with the WEF are expected. A percentage of the revenue per annum from the operational WEF will be made available to the community through a social beneficiation scheme, in accordance with the DoE bidding requirements of the REIPPPP. Therefore, the potential for creation of employment and business opportunities, and the opportunity for skills development for the local community is significant.</p>			
<p>5. Are the necessary services with adequate capacity currently available (at the time of application), or must additional capacity be created to cater for the development? (Confirmation by the relevant Municipality in this regard must be attached to the final Basic Assessment Report as Appendix I.)</p>	<p>YES</p>		<p>Please explain</p>
<p>The project is outside of the normal municipal service areas and therefore no services will be required from the local municipality. Contractors will be appointed to provide the required services for sewage and refuse removal. No effluent other than normal sewage are anticipated. A contractor will be appointed to manage it according to the management measures included in the Environmental Management Programme (EMPr). It is expected that portable ablution facilities will be used during the construction phase, which will be managed by the appointed contractor. Although low quantities of waste are anticipated, a contractor will be appointed to manage recycling activities and final disposal of waste that cannot be recycled. Electricity will be provided via a 11kV line servicing at least the construction camp and batching plant (associated with the WEF). Where required and no electricity is available onsite, temporary generators will be used instead.</p>			
<p>6. Is this development provided for in the infrastructure planning of the municipality, and if not what will the implication be on the infrastructure planning of the municipality (priority and placement of services and opportunity costs)? (Comment by the relevant Municipality in this regard must be attached to the final Basic Assessment Report as Appendix I.)</p>	<p>YES</p>		<p>Please explain</p>
<p>The project proponent is a private developer under the REIPPPP programme, and will not require any services from the local or district municipalities. The project will not impact infrastructure planning of the municipality.</p>			
<p>7. Is this project part of a national programme to address an issue of national concern or importance?</p>	<p>YES</p>		<p>Please explain</p>
<p>This project in its contribution to the renewable energy sector forms part of the National Development Plan.</p>			
<p>8. Do location factors favour this land use (associated with the activity applied for) at this place? (This relates to the contextualisation of the proposed land use on this site within its broader context.)</p>	<p>YES</p>	<p>NO</p>	<p>Please explain</p>
<p>Yes, please see the motivation for selecting this project location described under the alternatives section.</p> <p>The Karoo, and more specifically the proposed location, is identified as a feasible area for wind energy in terms of the Wind Atlas for South Africa (WASA) for the Western Cape and parts of the Northern, Western and Eastern Cape Provinces. WASA is a tool for identifying areas suitable for large-scale wind power generation and to provide more accurate wind resource data to identify potential off-grid wind generation location opportunities, using high climatological (30-year) annual mean wind speed (m/s) 100m above ground level. Figure 13 below indicates the proposed location in relation to the WASA.</p>			



Figure 13: The proposed project area in relation to the WASA.

Rietkloof WEF is located in an area where three wind projects were selected as preferred bidders under the Round 4 REIPPPP. This is a good indication that the area has high wind resources and the projects are competitive for succeeding in the REIPPPP. Grid access is deemed favourable for this site due to the close proximity of the existing Eskom Capacitor station, which is planned to be upgraded to a 400kV substation. The current Komsberg substation area is currently proposed to be expanded as a hub for connecting future developments in the area. The distance from a substation directly affects construction costs and losses associated with power transmission over a distance. The existing Eskom Komsberg Substation has sufficient grid capacity for the proposed project to connect. The same is true for the planned Bon Espirange substation.

Similar to the Renewable Energy SEA, Eskom’s Electricity Grid Infrastructure Strategic Environmental Assessment (Grid SEA) is also underway. The SEA is in accordance with the government’s commitment to implement the NDP and improve on infrastructure. More specifically, the Grid SEA is in support of SIP 10, which aims to achieve “Electricity and distribution for all”. The area in which the Rietkloof Wind Farm is proposed is currently within the corridor planned to be strengthened by Eskom as part of the Grid SEA. The Grid SEA aims to provide widespread distribution of electricity throughout South Africa and to initialise economic development within areas limited to electricity access to meet the country’s economic and social development needs.

9. Is the development the best practicable environmental option for this land/site?	YES	Please explain
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Yes, the current agricultural activities can continue as it is not mutually exclusive with the proposed electrical infrastructure and associated WEF. While variation in the micro-siting of the distribution lines are still expected in line with environmental and technical specifications, the overall project location cannot be altered, as this project would feed into the fixed or authorised location of the associated Rietkloof WEF.

The specialist studies undertaken as part of this Basic Assessment conclude that the development of the substation and power lines will have medium - low environmental impacts. Should the infrastructure not be constructed as proposed, the wind energy facility would not be connected to the electricity grid. The implementation of the proposed project is therefore the best practicable environmental option.

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10. Will the benefits of the proposed land use/development outweigh the negative impacts of it?	YES		Please explain
<p>Yes, the specialist studies undertaken to inform this Basic Assessment concluded that the development of the electrical infrastructure will have medium - low environmental impacts. Should the infrastructure not be constructed as proposed, the proposed WEF would not be connected to the national grid which will have a negative impact at a local, regional and national level.</p> <p>Localised positives such as increased job creation, in addition to the national supply of renewable energy and the moderate to low environmental risk (as per specialist reports) combine to provide support that this project which will result in greater benefit than negative impact.</p>			
11. Will the proposed land use/development set a precedent for similar activities in the area (local municipality)?		NO	Please explain
<p>The region is declared as a REDz and there are numerous wind and solar developments already authorised or being proposed. Please see section (f) above for the detailed map.</p>			
12. Will any person's rights be negatively affected by the proposed activity/ies?		NO	Please explain
<p>No. Landowners already provided consent to proceed with the proposed development on their properties. Local labour will be employed as far as possible, thus reasonably promoting job creating in the short term, and the improved electrical supply and infrastructure will nurture economic growth and reduced electricity prices in the national context. All landowners and neighbours were notified of the proposed project through the circulation of a Background Information Document (BID) as included in Appendix E. No concerns were raised to date. If the project is not authorised, the rights of the developer will be severely affected as the WEF will not be able to connect to the National Grid.</p>			
13. Will the proposed activity/ies compromise the "urban edge" as defined by the local municipality?		NO	Please explain
<p>No. the property is not located near the urban edge, and will not impact thereon. Private landowners (mainly farming) will be affected by the proposed project and these landowners and neighbours have been consulted by the environmental team and are aware of the proposed project. See proof of communication included in Appendix E.</p>			
14. Will the proposed activity/ies contribute to any of the 17 Strategic Integrated Projects (SIPs)?	YES		Please explain
<p>Although not strictly designated a strategic integrated project in and of itself, this project will contribute to a few subcomponents of the Strategic Integrated Projects goals, namely that of promoting balanced economic development, unlocking economic opportunities, addressing socio-economic needs, promoting job creation, helping integrate human settlements and economic development and SIP8: green energy in support of South African economy. The construction of the proposed electrical infrastructure will provide local residents opportunities to gain short term employment, which would contribute towards the socio economic needs of individuals and the community.</p>			
15. What will the benefits be to society in general and to the local communities?			Please explain
<p>Society in general:</p> <ol style="list-style-type: none"> 1. Contributing to reach the goals set out in the National Development Plan, Integrated Energy Plan for the Republic of South Africa, IRP 2010. 2. Increased generation capacity from a renewable resource that will be fed into the national grid; 3. Additional grid connection options to allow for more flexible distribution locally in the future; and 4. A small reduction in employment needs; <p>Local communities:</p> <ol style="list-style-type: none"> 1. Community upliftment through additional employment opportunities within the project area and economic development contributions in terms of the REIPPPP. 			
16. Any other need and desirability considerations related to the proposed activity?			Please explain
<p>A further motivating factor is the proximity of the project to the N1 highway. This enables easy access to and</p>			

from site for all staff members in the nearby communities, and will simplify the transport of components to site, thus avoiding large scale access road requirements. This project will also make use of the access roads provided for with the Rietkloof Wind Energy Facility, further reducing access road requirements.

17. How does the project fit into the National Development Plan for 2030?	Please explain
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The National Development Plan (NDP) is aimed at reducing and eliminating poverty in South Africa by 2030. It promotes sustainable and inclusive development in South Africa, in favour of a decent standard of living for all. The proposed distribution line fulfils 3 of the 12 key focus areas namely contributing to an economy that will create more jobs; improving infrastructure and transition to a low carbon economy. The NDP outlines the need for South Africa to increase production of electricity by 40,000 MW by 2030, 20,000 MW of this capacity has been proposed for production from renewable sources. The proposed project aims to be a contributor towards such target, by forming a vital link in the feasibility of the associated Rietkloof WEF, and by being the only means of benefiting the energy produced from the associated WEF.

Integrated Energy Plan

Furthermore, the proposed project is in line with the Integrated Energy Plan for the Republic of South Africa (2003) commissioned by then Department of Minerals and Energy (now the Department of Energy (DoE)) in response to the requirements of the National Energy Policy. The framework is intended to create a balance between energy demand and resource availability so as to provide low cost electricity for social and economic development, while taking into account health, safety and environmental parameters. This project would contribute to diversification of energy supply and the promotion of universal access to clean energy, by allowing for evacuation and beneficiation of the energy produced by the associated WEF.

Integrated Resource Plan

The Integrated Resource Plan (IRP 2010) for South Africa illustrates a clear need for renewable energy projection. The IRP was initiated by the DoE and lays the foundation for the country's energy combination up until 2030, and seeks to find an appropriate balance between the expectations of different stakeholders considering a number of key constraints and risks, including the reduction of carbon emissions; security of supply; Southern African regional development and integration and localisation and job creation. The Policy-Adjusted IRP includes recent development prices and issues allocations of 17.8GW for renewable energies, of the total 42.6GW new-build up to 2030 distributed to wind (8.4GW), concentrated solar power (1.0GW) and photovoltaic (8.4GW).

REIPPPP

Renewable Energy Independent Power Producer Procurement Programme (REIPPPP), aims to promote and procure electricity generated by the private-sector from renewable energy sources. DoE has placed a target of 10 000 Gigawatt hours (GWh) of renewable energy power generation for the country. The REIPPPP initially aimed to procure 3725MW renewable energy by 2016, however in 2012 it was announced that an additional 3200MW of renewable energy would be procured and in August 2015, this allocation further increased by a renewable energy generation capacity of 6300 MW gazetted in a Ministerial determination (DoE, 2015).

As demonstrated above there is a need for renewable energy in South Africa. If the project is deemed feasible, Rietkloof Wind Farm intends to bid this wind farm under the REIPPPP programme in order to supply the electricity generated to Eskom. This project (this application) would serve as ancillary infrastructure to the WEF project and would be indispensable in order to make use of the energy produced.

18. Please describe how the general objectives of Integrated Environmental Management as set out in section 23 of NEMA have been taken into account.

The proposed project has been adequately assessed by competent Environmental Assessment Practitioners and a team of specialists. All potential impacts that may have a significant impact on the receiving environment have been identified and adequately assessed as required by the NEMA 2014 EIA regulations and mitigation measures developed and the impact significance assessed. The conclusions of the Basic Assessment have been concisely summarised to adequately inform decision-making by the competent

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authority. A comprehensive Public Participation Process was also undertaken which conformed to requirements of the 2014 EIA Regulations. Furthermore, all Interested and Affected Parties were given ample time (as per the requirements of the EIA Regulations) to review and comment on all documents and reports and the affected landowners will be empowered to be able to state their concerns and issues adequately.

19. Please describe how the principles of environmental management as set out in section 2 of NEMA have been taken into account.

The principles of NEMA have been considered in this assessment through compliance with the requirements of the relevant legislation in undertaking the assessment of potential impacts, as well as through the implementation of the principle of sustainable development where appropriate mitigation measures have been recommended for impacts which cannot be avoided.

In addition, the successful implementation and appropriate management of this proposed project will aid in achieving the principle of minimisation of pollution and environmental degradation. This process has been undertaken in a transparent manner and all effort have been made to involve interested and affected parties, stakeholders and relevant Organs of State such that an informed decision regarding the project can be made by the Regulating Authority.

11. APPLICABLE LEGISLATION, POLICIES AND/OR GUIDELINES

List all legislation, policies and/or guidelines of any sphere of government that are applicable to the application as contemplated in the EIA regulations, if applicable:

LEGISLATION	RELEVANCE TO THE PROPOSED PROJECT	PERMIT / LICENCE / COMMENT REQUIRED	COMMENT
ENVIRONMENTAL			
The Constitution of South Africa (Act 108 of 1996)	The developer has an obligation to ensure that the proposed activity is ecologically sustainable, will not result in pollution and ecological degradation while demonstrating economic and social development and upholding environmental rights.	N/A	-
National Environmental Management Act (Act 107 of 1998) (NEMA)	This BA was undertaken in terms of NEMA requirements. The developer must be mindful of the principles, broad liability and implications associated with NEMA and must eliminate or mitigate any potential impacts.	X	-
Environmental Impact Assessment (EIA) Regulations, 2014	The proposed development triggers the two lists of activities, published on 4 December 2014, as Listing Notices GN R.983, and R.985. These Listing Notices define the activities that require a Basic Assessment (applies to activities with limited environmental impacts listed in GN R. 983 and R.985). The relevant competent authority is the National DEA. This BA will be submitted to the DEA to ensure that the national environmental principles, fair decision making and integrated environmental management approach is applied through the process. The assessment and associated EMPr aim to prevent pollution and ecological degradation, promote conservation and secure ecological sustainable development and use of natural resources while promoting justifiable economic and social development, as outlined in the Act.	X	-

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LEGISLATION	RELEVANCE TO THE PROPOSED PROJECT	PERMIT / LICENCE / COMMENT REQUIRED	COMMENT
The National Environment Management Biodiversity Act (Act 10 of 2004) (NEM:BA)	The project development area located within the Western Cape is considered to be a Critical Biodiversity Area which means there are potentially sensitive and potentially irreplaceable vegetation. Within the Northern Cape, the CBAs are associated with south-facing slopes and are based on the assumption that these areas are important as refuges for fauna and flora in the face of climate change. To avoid and or mitigate threats to any endangered ecosystems all impacts on sensitive ecosystems were assessed in detail during the BA process to ensure the impacts of the proposed development are understood and can be mitigated; It was recommended that a final site walkthrough be undertaken to inform the micro-sitting and the permit applications in terms of NEM:BA. To avoid alien vegetation from establishing on disturbed areas, appropriate measures will be implemented as described in the EMPr.	X	A permit for the removal of species of special concern may be required depending on the outcome of the final site walkthrough to inform micro-sitting of the infrastructure.
Nature and Environmental Conservation Ordinance 1974	If the specialist ecology assessment (during the final site walkthrough) identifies protected and endangered flora species within the Western Cape that will be pluck due to project related activities, the Holder of the EA will need to apply for the necessary permit(s) in terms of this Act;	x	A permit may be required for the removal of species of special concern depending on the outcome of the final site walkthrough to inform micro-sitting of the infrastructure.
NEM: BA Northern Cape Conservation Ordinance	A permit may be required in the event that a listed plant species onsite will need to be removed, disturbed or destroyed within the Northern Cape. This will be informed by the final site walk through by the ecologist.	x	A permit for the removal of species of special concern may be required depending on the outcome of the final site walkthrough to inform micro-sitting of the infrastructure.
National Water Act (Act 36 of 1998)	The distribution line and its associated service roads will cross various watercourses and could potentially alter the bed, banks, course or characteristics of a watercourse or impede the flow of a watercourse.	X	Should activity trigger Section 21 c and i, an application for such activities will be submitted to the relevant Catchment Management Agency to obtain a

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LEGISLATION	RELEVANCE TO THE PROPOSED PROJECT	PERMIT / LICENCE / COMMENT REQUIRED	COMMENT
			General Authorisation or Water Use Licence.
National Environmental Management: Waste Act (Act. 59 of 2008)	Construction activities will generate construction related waste that will need to be disposed of at a registered landfill site if the waste cannot be recycled or reused. Waste generated will be dealt with in a manner compliant with the requirements of the Act.	N/A	-
National Environmental Management: Air Quality Act (Act 39 of 2004)	Not applicable to this development	N/A	-
National Veld and Forest Fire Act (Act 101 of 1998)	The proposed project must register as a member of the fire protection association in the area as required in Section 3 of the Act. The developer will be required to take all practical measures to ensure that fire breaks are prepared and maintained according to the specifications contained in Section 12 - 14 of Chapter 4 of the Act.	N/A	-
National Forests Act (Act 84 of 1998)	If any protected trees in terms of this Act occur on site and would need to be removed, the developer will require a licence from the Department of Agriculture, Forestry and Fisheries to perform any of the above-listed activities. The ecologist confirmed that no protected trees will be impacted by the proposed development.	NA	-
Conservation of Agricultural Resources Act (Act 43 of 1983)	Approval will be required from the Department of Agriculture, Forestry and Fisheries (DAFF) for any activities on the land zoned for agriculture and any proposed rezoning or sub-divisions of agricultural land. An agricultural potential assessment was conducted to determine how the proposed development may impact on the agricultural production potential of the WEF site. Although the study was not undertaken specifically for the electrical infrastructure, it covers the same area and will therefore inform the comment from DAFF. The area is currently used for grazing and will continue to be used for grazing after construction. All infrastructure is proposed in areas of low agricultural potential. Service roads will be routed to avoid any cultivated land.	X	-
Subdivision of Agricultural Land Act (Act 70 of 1970)	Long-term lease agreements (over 10 years) on portion/s of agricultural land require the consent from the Minister of Agriculture, Forestry and Fisheries before they can be registered. The servitudes for the project may be on portions of the properties and will require a consent from DAFF.	X	Separate applications will be submitted to DAFF in respect of lease agreements that trigger SALA (Act 70 of 1970)

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LEGISLATION	RELEVANCE TO THE PROPOSED PROJECT	PERMIT / LICENCE / COMMENT REQUIRED	COMMENT
Mineral and Petroleum Resources Development Act (Act 107 of 2002) (MPRDA)	Not applicable for this project.	NA	-
Astronomy Geographic Advantage Act (Act 21 of 2007)	<p>The purpose of the Act is to preserve the geographic advantage areas that attract investment in astronomy. The entire Northern Cape Province excluding the Sol Plaatje Municipality has been declared an astronomy advantage area. The Northern Cape optical and radio telescope sites were declared core astronomy advantage areas. The Act allowed for the declaration of the Southern Africa Large Telescope (SALT), MeerKAT and Square Kilometre Array (SKA) as astronomy and related scientific endeavours that had to be protected.</p> <p>The proposed project is located within the Sutherland Central Astronomy Advantage Area, which was declared by the Minister of Science and Technology and published in the Government Gazette (No. 37434, Notice 199 of 2014) on 12 March 2014 as part of the Astronomy Geographic Advantage (AGA) Act of 2007.</p> <p>The proposed project is approximately 73km from SALT. Night lights will be compliant to the requirements of the CAA and lighting of other infrastructure will be limited as far as possible. Dust and light impacts will be mitigated through measures described in the EMP. Due to the distance and the nature of this project, it is not anticipated that it will impact SALT.</p> <p>SKA provided a comment and confirmed that the closest SKA-station is 78km from project and will therefore not impact SKA.</p> <p>SALT, SKA and SAAO were invited to provide comments on the proposed project.</p>	x	-
SOCIAL			
Occupational Health and Safety Act (85 of 1993)	The developer must be mindful of the principles and broad liability and implications contained in the Operational Health and Safety Act and mitigate any potential impacts.	N/A	Applicable at all stages of development. All contractors need to adhere to Act.
National Heritage Resources Act (25 of 1999)	The project was registered with South African Heritage Resource Agency (SAHRA). A heritage assessment has been undertaken to determine if heritage features	X	

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LEGISLATION	RELEVANCE TO THE PROPOSED PROJECT	PERMIT / LICENCE / COMMENT REQUIRED	COMMENT
	<p>occur on site and what level impact assessment (if any) maybe required. In the event that archaeological or historically significant sites would be destroyed, damaged, excavated, altered or defaced by the proposed project activity the relevant permit will be granted before the project can continue.</p> <p>A Notice of Intent to Develop (NID) was submitted to Heritage Western Cape (HWC) and Ngwao-Boswa Ya Kapa Bokone (Northern Cape heritage authority) and SAHRA. A heritage impact assessment was compiled for the electrical infrastructure. Although the palaeontology impact assessment and visual impact assessment were not undertaken specifically for the electrical infrastructure, it covers the same area and will therefore inform the comment from the heritage authorities. <u>A visual impact assessment was not undertaken as the proposed overhead 132kV distribution line will run along the existing 400kV and 765kV Eskom power line within the project area and along the 11kV power line from the project area to the Bon Espirange Substation. Therefore, there are likely to be no additional visual impacts to the visual impacts already experienced as a result of the 132kV distribution line.</u></p>		
PLANNING			
National Road Traffic Act (No. 93 of 1996) (NTRA)	All the requirements stipulated in the NRTA will need to be complied with during the construction and operational phases of the proposed development in terms of crossing the R354 to connect to Komsberg.	X	N/A for the EIA process.

12. WASTE, EFFLUENT, EMISSION AND NOISE MANAGEMENT

a) Solid waste management

Will the activity produce solid construction waste during the construction/initiation phase?
If YES, what estimated quantity will be produced per month?

YES	
very low quantities	

How will the construction solid waste be disposed of (describe)?

Very low quantities of waste are anticipated to be generated during the construction phase and no waste will be generated during the operational phase. All solid waste generated that cannot economically be recycled will be disposed of at a registered or licensed landfill site. Skip waste containers and waste collection bins will be maintained on site and the contractor will arrange for them to be collected regularly and transported to the landfill site. No waste will be burned or buried on site. Hazardous materials and contaminants will be stored carefully to prevent contamination until being disposed of at a licensed hazardous waste site.

Where will the construction solid waste be disposed of (describe)?

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All solid waste will be disposed of at a registered landfill site (Laingsburg Municipal Landfill site – Permit # 16/2/7/F400/Z2/P286). The solid waste will be stored on site using a skip, emptied using trucks at the transfer facility in Matjiesfontein, and taken to the Laingsburg landfill site for final disposal. Only solid waste will be disposed of as such (i.e. no liquid or hazardous waste will form part of this process).

All hazardous components will be discarded at a licensed hazardous waste disposal facility.

Will the activity produce solid waste during its operational phase?

	NO
If YES, what estimated quantity will be produced per month?	0 m ³

How will the solid waste be disposed of (describe)?

No solid waste will be produced during the operational phase.

If the solid waste will be disposed of into a municipal waste stream, indicate which registered landfill site will be used.

No solid waste will be produced during the operational phase.

Where will the solid waste be disposed of if it does not feed into a municipal waste stream (describe)?

No solid waste will be produced during the operational phase.

If the solid waste (construction or operational phases) will not be disposed of in a registered landfill site or be taken up in a municipal waste stream, then the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA.

Can any part of the solid waste be classified as hazardous in terms of the NEM:WA?

	NO
--	-----------

If YES, inform the competent authority and request a change to an application for scoping and EIA. An application for a waste permit in terms of the NEM:WA must also be submitted with this application.

Is the activity that is being applied for a solid waste handling or treatment facility?

	NO
--	-----------

If YES, then the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA. An application for a waste permit in terms of the NEM:WA must also be submitted with this application.

b) Liquid effluent

Will the activity produce effluent, other than normal sewage, that will be disposed of in a municipal sewage system?

	NO
--	-----------

If YES, what estimated quantity will be produced per month?

	0 m ³
--	------------------

Will the activity produce any effluent that will be treated and/or disposed of on site?

	NO
--	-----------

If YES, the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA.

Will the activity produce effluent that will be treated and/or disposed of at another facility?

	NO
--	-----------

If YES, provide the particulars of the facility:

Facility name:	N/A		
Contact person:	N/A		
Postal address:	N/A		
Postal code:	N/A		
Telephone:	N/A	Cell:	N/A
E-mail:	N/A	Fax:	N/A

BASIC ASSESSMENT REPORT

Describe the measures that will be taken to ensure the optimal reuse or recycling of waste water, if any:

No effluent other than sewage are anticipated and this will be managed by a contractor.

c) Emissions into the atmosphere

Will the activity release emissions into the atmosphere other than exhaust emissions and dust associated with construction phase activities?

NO

If YES, is it controlled by any legislation of any sphere of government?

If YES, the applicant must consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA.

If NO, describe the emissions in terms of type and concentration:

The only emissions anticipated include exhaust discharge from machinery and dust associated with construction activities. None of the anticipated emissions will exceed acceptable and regulated limits.

d) Waste permit

Will any aspect of the activity produce waste that will require a waste permit in terms of the NEM:WA?

NO

If YES, please submit evidence that an application for a waste permit has been submitted to the competent authority

e) Generation of noise

Will the activity generate noise?

YES

If YES, is it controlled by any legislation of any sphere of government?

YES

Describe the noise in terms of type and level:

The construction phase of the project will include general construction noise generated by vehicle movement, construction workers but would not exceed acceptable limits and will be temporary. The operation phase of the facility will only induce a slight 'buzz' sound when near the conductors (corona effect), but will not exceed specifications or regulations, and is not considered a genuine noise impact. This noise will vary depending on the weather conditions and in dry conditions; the noise level will be comparative with the usual ambient noise level in the environment as measured in the noise impact assessment undertaken to inform the EIA for the wind farm application (Williams, 2016)⁹.

13. WATER USE

Please indicate the source(s) of water that will be used for the activity by ticking the appropriate box(es):

Municipal	Water board	Groundwater	River, stream, dam or lake	Other	The activity will not use water
-----------	-------------	-------------	----------------------------	-------	--

If water is to be extracted from groundwater, river, stream, dam, lake or any other natural feature, please indicate the volume that will be extracted per month:

0 litres

Does the activity require a water use authorisation (general authorisation or water use license) from the Department of Water Affairs?

YES

⁹ Williams, B. 2016. Proposed Rietkloof Wind Energy Facility in the Western Cape Provinces South Africa. Specialist Study on Noise Impacts.

If YES, please provide proof that the application has been submitted to the Department of Water Affairs.

The water use license/general authorisation application has not yet been submitted to the Department of Water Affairs as the Department will only process applications once the project is awarded preferred bidder under the REIPPPP.

14. ENERGY EFFICIENCY

Describe the design measures, if any, which have been taken to ensure that the activity is energy efficient:

The project in its very nature is aimed at electricity distribution in the most energy efficient manner. The proposed activity will not consume power. Electrical conductors and pylon types have been selected by the project technical team to ensure the most efficient and cost effective technology has been selected for use.

Describe how alternative energy sources have been taken into account or been built into the design of the activity, if any:

This distribution line will serve a renewable source of energy generation, namely the Rietkloof WEF. The technology is regarded as national priority and a more acceptable form of energy generation than that of traditional coal-powered power stations.

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SECTION B: SITE/AREA/PROPERTY DESCRIPTION

Important notes:

- For linear activities (pipelines, etc) as well as activities that cover very large sites, it may be necessary to complete this section for each part of the site that has a significantly different environment. In such cases please complete copies of Section B and indicate the area, which is covered by each copy No. on the Site Plan.

Section B Copy No. (e.g. A):

- Paragraphs 1 - 6 below must be completed for each alternative.

- Has a specialist been consulted to assist with the completion of this section? **YES**
 If YES, please complete the form entitled "Details of specialist and declaration of interest" for each specialist thus appointed and attach it in Appendix I. All specialist reports must be contained in Appendix D.

Property description/physical address:

Province	Please refer to full list in Appendix J1.
District Municipality	Same as above
Local Municipality	Same as above
Ward Number(s)	Same as above
Farm name and number	Same as above
Portion number	Same as above
SG Code	Same as above

Where a large number of properties are involved (e.g. linear activities), please attach a full list to this application including the same information as indicated above.

Current land-use zoning as per local municipality IDP/records:

Please refer to full list in Appendix J1.

In instances where there is more than one current land-use zoning, please attach a list of current land use zonings that also indicate which portions each use pertains to, to this application.

Is a change of land-use or a consent use application required?

1. GRADIENT OF THE SITE

Indicate the general gradient of the site.

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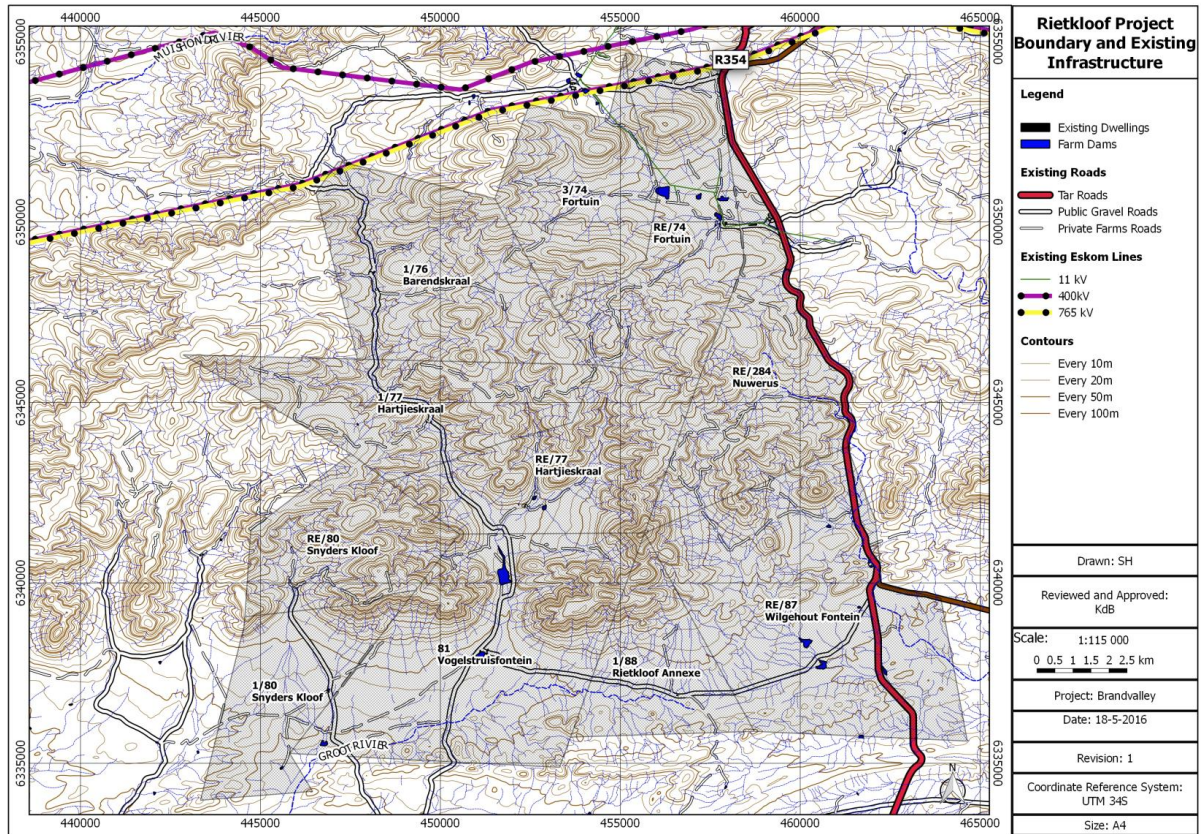


Figure 14: Contours for the Rietkloof project site.

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2. LOCATION IN LANDSCAPE

Indicate the landform(s) that best describes the site:

2.1 Ridgeline	<input checked="" type="checkbox"/>	2.4 Closed valley	<input checked="" type="checkbox"/>	2.7 Undulating plain / low hills	<input checked="" type="checkbox"/>
2.2 Plateau	<input checked="" type="checkbox"/>	2.5 Open valley	<input checked="" type="checkbox"/>	2.8 Dune	<input type="checkbox"/>
2.3 Side slope of hill/mountain	<input checked="" type="checkbox"/>	2.6 Plain	<input type="checkbox"/>	2.9 Seafront	<input type="checkbox"/>
2.10 At sea	<input type="checkbox"/>				

Topography

The surrounding area consists of a slightly undulating to hilly landscape, while the majority of the project area comprises slopes and broad ridges of low mountains and escarpments. The Rietkloof Wind Farm site is characterised by high hills and ridges on the north and central areas, grading into open undulating hills and ridges southwards. The overall landscape decreases in height from 1 073 meters above sea level (masl) in the north to 885masl at the southern sections of the Rietkloof Wind farm. The highest point is at the central area of the Rietkloof Wind farm at 1 313masl and the lowest at the southernmost point at 885 masl. The landscape changes from undulating hills in the north to a flat, open valley in the south. The overall landscape altitude decreases westward from 1 158 masl in the east to 912 masl in the west with the highest point at 1 488 masl in the central area (de Kock, 2016).

3. GROUNDWATER, SOIL AND GEOLOGICAL STABILITY OF THE SITE

Is the site(s) located on any of the following?

	Alternative S1:	Alternative S2 (if any):	Alternative S3 (if any):
Shallow water table (less than 1.5m deep)	<input type="checkbox"/> NO	<input type="checkbox"/> NO	<input type="checkbox"/> NO
Dolomite, sinkhole or doline areas	<input type="checkbox"/> NO	<input type="checkbox"/> NO	<input type="checkbox"/> NO
Seasonally wet soils (often close to water bodies)	<input type="checkbox"/> NO	<input type="checkbox"/> NO	<input type="checkbox"/> NO
Unstable rocky slopes or steep slopes with loose soil	<input type="checkbox"/> NO	<input type="checkbox"/> NO	<input type="checkbox"/> NO
Dispersive soils (soils that dissolve in water)	<input type="checkbox"/> NO	<input type="checkbox"/> NO	<input type="checkbox"/> NO
Soils with high clay content (clay fraction more than 40%)	<input type="checkbox"/> NO	<input type="checkbox"/> NO	<input type="checkbox"/> NO
Any other unstable soil or geological feature	<input type="checkbox"/> NO	<input type="checkbox"/> NO	<input type="checkbox"/> NO
An area sensitive to erosion	<input type="checkbox"/> NO	<input type="checkbox"/> NO	<input type="checkbox"/> NO

If you are unsure about any of the above or if you are concerned that any of the above aspects may be an issue of concern in the application, an appropriate specialist should be appointed to assist in the completion of this section. Information in respect of the above will often be available as part of the project information or at the planning sections of local authorities. Where it exists, the 1:50 000 scale Regional Geotechnical Maps prepared by the Council for Geo Science may also be consulted.

The entire Rietkloof project site consists of sedimentary rocks of the Karoo Supergroup. Stratigraphy ranges from older Ecca Group of rocks in the south to more recent Beaufort Group deposits in the northern sections.

Ecca Group

The Permian-aged Ecca sediments reflect lateral facies changes that characterise this succession. Lithostratigraphically, Ecca rocks within the study site consists of:

A. Whitehill Formation Fm (Lower Ecca)

Mudrocks of this Fm weather white on the surface, making it a very useful marker unit. In fresh outcrop and in the subsurface, the predominant facies is black, carboniferous, pyrite-bearing shale. The shale is very thinly laminated and contains up to 14% carboniferous material. The thickness varies from 10 to 80m and contains the fossilised reptile

Mesosaurus.

B. Tierberg Fm

The Tierberg Fm is predominantly an argillaceous succession which reaches a maximum thickness of approximately 700m. It rests with a sharp contact on the Whitehill Fm and grades upwards into the arenaceous Waterford Fm. Rocks comprise well-laminated, dark grey to black shale. Calcareous concretions are common with clastic rhythmites occurring at various levels in the sequence.

C. Waterford Fm

The major rock types found are fine-to medium-brained sandstone, siltstone, shale, and rhythmite in a succession with a mean thickness of 130m. The Fm displays an overall coarsening upward pattern, grading from the argillaceous underlying Tierberg Fm through alternating sandstone, siltstone and mudstone into a sandstone-dominated interval at the top.

Beaufort Group

The dominant geological feature within the northern farm portions of the proposed Rietkloof consists of sedimentary deposits of the Abrahamskraal Formation, which forms part of the Adelaide Subgroup of rocks which is part of the Beaufort Group of rocks which in turn makes up part of Karoo Supergroup of geological formations.

A. Abrahamskraal Formation

The Abrahamskraal Formation consists of alternating bluish-grey, greenish-grey, or greyish-red mudrock and grey, very fine to medium grained, lithofeldspathic sandstones. Sandstones usually constitute 20-30% of the total thickness but may vary locally. Individual sandstones average a thickness of 6m with a maximum of 60m. Calcareous concretions 20-100cm in diameter are present in some sandstone layers.

Sandstone units usually form fining upwards cycles. These cycles vary from a few meters to tens of meters in thickness and were probably formed by the lateral migration of meandering rivers during the second major tectonic paroxysm of the Cape Fold Belt approx. 258Ma. The mudstones represent depositions in a flood plain and lacustrine environment.

Soils

Soils within the Rietkloof WEF area consist mostly of rocks with limited soils grading in steep areas to soils with minimal development that are usually shallow, overlying rock of weathering rock, with or without intermittent diverse soils southwards. The dominant soil forms identified within the Rietkloof project site (de Kock, 2016) were:

Mispah soil form (11 000ha)

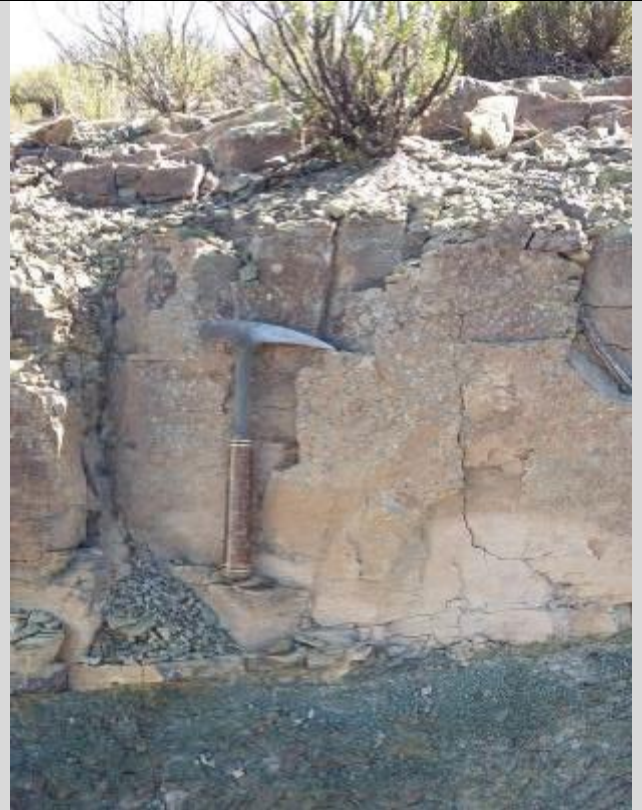
Glenrosa soil form (13 600ha)

Inanda soil form (6 000ha)

The bulk of the project infrastructure (approximately 90%) will be located on Mispah and Glenrosa soils. The remainder will be located on Inanda soils.



Highly fractured mudrock with no soil



Solid mudrock with limited soils



Orange undifferentiated soil with pebbles



Bleached undifferentiated soil with rock fragments and rocks

Plate 5: Photos of Mispah soil forms found onsite.

The Mispah soil form on the Rietkloof project site consists of a shallow orthic A horizon overlying hard rock or surface bare rock with no soil horizon. In this instance hard rock is classified as horizontally orientated, hard, fractured sediments which

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do not have any distinct vertical channels containing soil material and bedrock. The A horizon is mostly non-calcareous and not bleached and therefore is classified as Myhill Soil Family. However, localised areas reflect calcareous A horizons and therefore are classified as Carnarvon Soil Family. See Plate 5 for photos of Mispah soil forms found onsite.

The Glenrosa soil form consists of a surface horizon that cannot be classified as organic, humic, vertic or melanic although it is sometimes darkened by organic matter. It is therefore classified as an orthic A horizon. Subsoil directly underlies the orthic A horizon and merges into the underlying rock. This layer consists mostly of fresh or weathered parent rock and therefore is classified as a lithocutanic B horizon. The A horizon is bleached most of the time while the B horizon is hard, non-calcareous with no sign of wetness, and therefore are classified as Bergsig Soil Family. See Plate 6 for photos of Glenrosa soil forms found onsite.



Bleached soils with a well-defined plant root layer over a meter thick.



Redish-orange soil up to 90cm thick.

Plate 6: Photos of Glenrosa soil forms found onsite

The Inanda soil form has a distinct humic A horizon of various thickness overlying a red apedal B horizon. This soil type has a high salt content and is consequently usually brackish. Known as saline soil, it can cause damage to and stall plant growth, impede germination, and cause difficulties in irrigation. The salinity is due to the buildup of soluble salts in the rhizosphere—high salt contents prevent water uptake by plants, leading to drought stress. The humic A horizon is usually thin with a non-luvic B1 horizon and therefore is classified as Himeville Soil Family.

Soil samples were collected on Glenrosa soil form which contains a hard orthic A horizon occurring on a fine lithocutanic B horizon; from a deeper humic A horizon overlying a red apedal B horizon of varying depth (called Inanda soil form) and on soils overlying hard rock (Mispah soil form). The samples were analysed to determine the Total Exchange Capacity (TEC) to compare soil characteristics of the different soil samples.

All soils within the Rietkloof WEF site occurs on sand with a low organic content. Table 4 summarises average conditions of soils found onsite.

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Table 4: Average soil conditions within the Rietkloof site.

Measured condition	Glenrosa Soils	Inanda Soils	Mispah Soils
pH	7.8	8	6.6
Organic content	1.1%	0.97	1.5
Ca	62.77%	59.87	25.74
Mg	27.53%	30.55	25.74
K	3.59%	4.08	4.3
Na	2.49%	2.08	2.05

Soil pH is considered as optimum between 6.5 and 7 for the highest plant nutrient availability for most crops. Mispah soils falls within this range while Glenrosa and Inanda soils are more alkaline, and are not suitable for most crops.

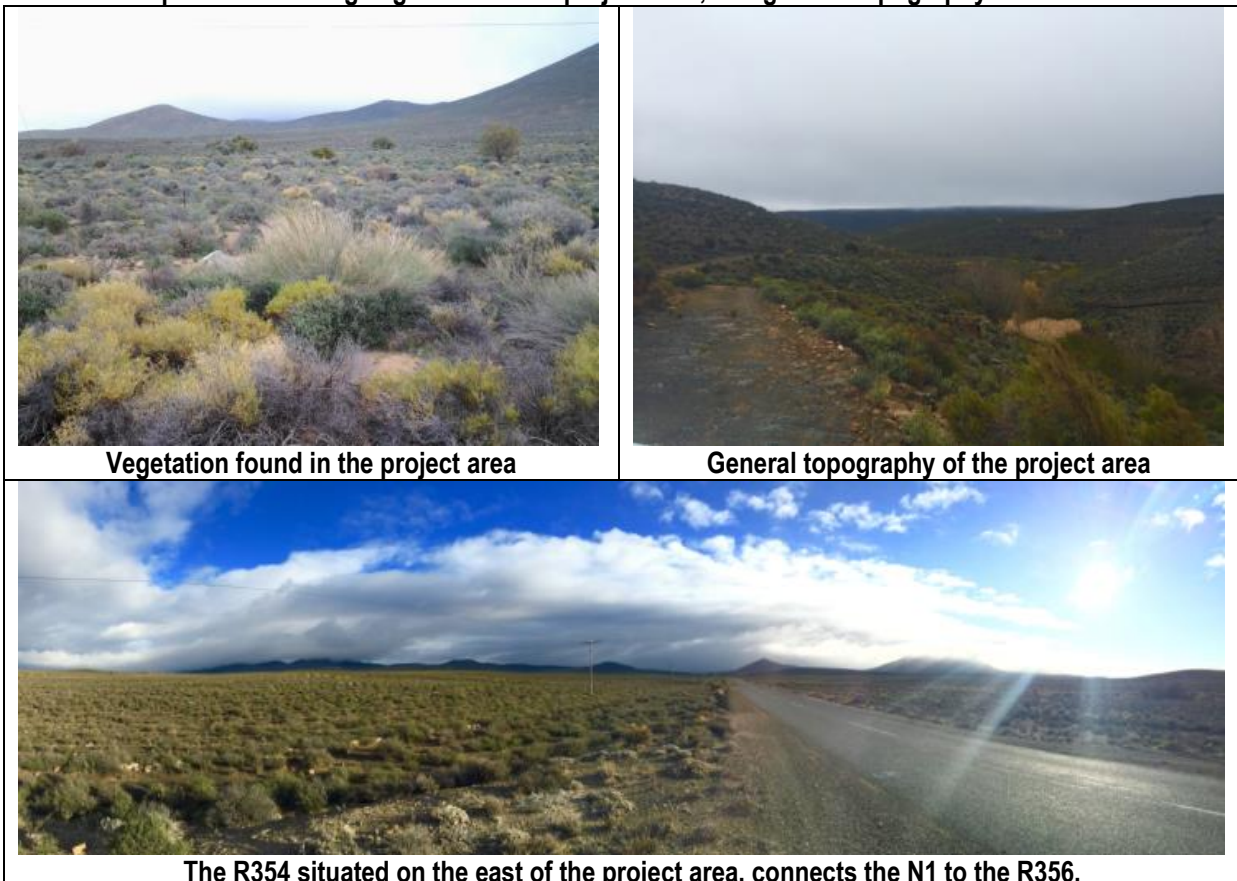
4. GROUNDCOVER

Indicate the types of groundcover present on the site. The location of all identified rare or endangered species or other elements should be accurately indicated on the site plan(s).

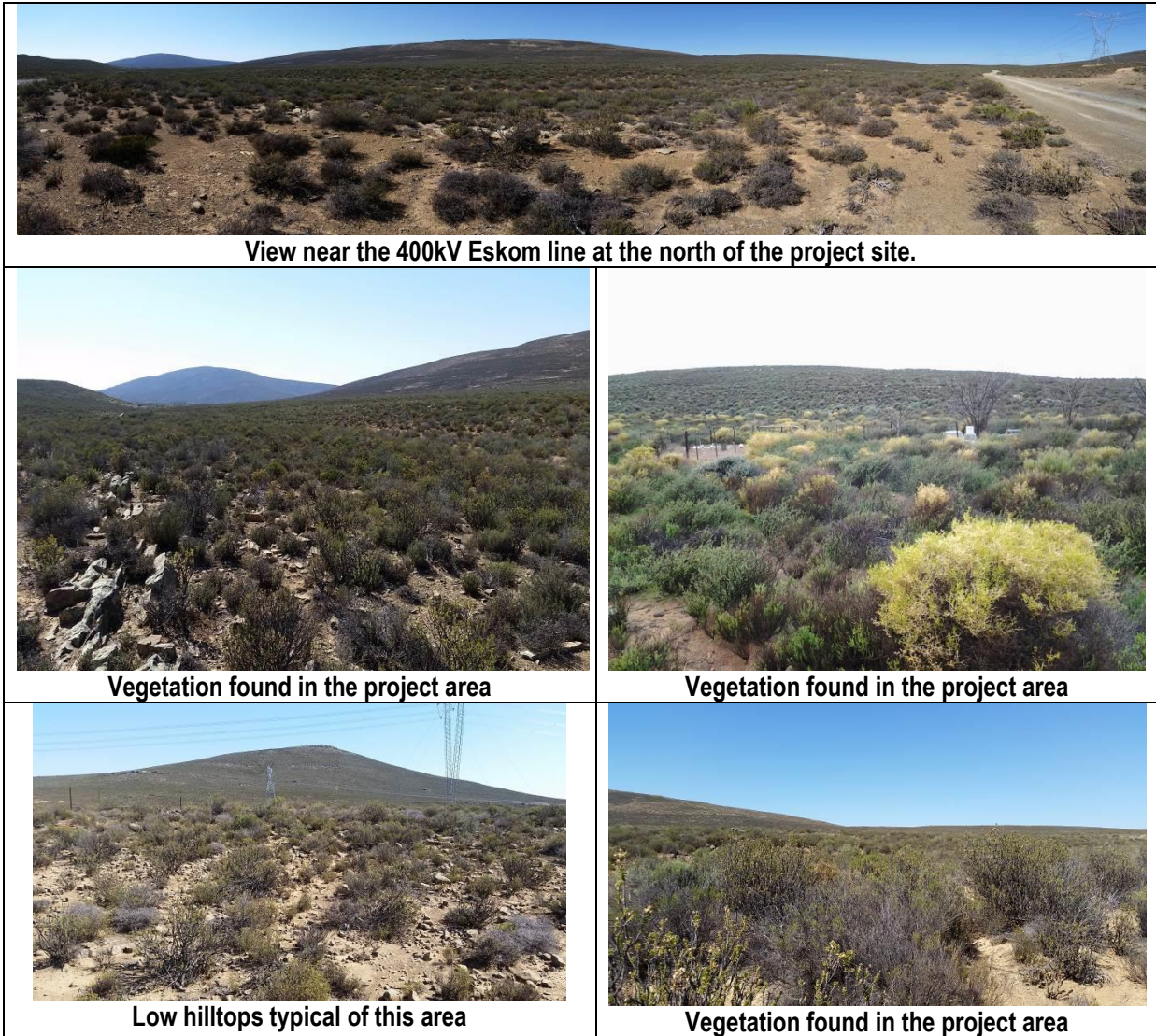
Natural veld – good condition ^E	Natural veld with scattered aliens ^E	Natural veld with heavy alien infestation ^E	Veld dominated by alien species ^E	Gardens
Sport field	Cultivated land	Paved surface	Building or other structure	Bare soil

If any of the boxes marked with an “E” is ticked, please consult an appropriate specialist to assist in the completion of this section if the environmental assessment practitioner doesn’t have the necessary expertise.

Plate 1: Site pictures showing vegetation in the project area, and general topography.



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5. SURFACE WATER

Indicate the surface water present on and or adjacent to the site and alternative sites?

Perennial River		NO	
Non-Perennial River	YES		
Permanent Wetland	YES		
Seasonal Wetland	YES		
Artificial Wetland	YES		
Estuarine / Lagoonal wetland		NO	

If any of the boxes marked YES or UNSURE is ticked, please provide a description of the relevant watercourse.

The proposed development occurs within the following catchments within the Nama Karoo ecoregion¹⁰:

1. E22A – Groot River

¹⁰ Colloty, B. 2016. Rietkloof Wind Energy Facility . Aquatic Impact Assessment.

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2. E22B – Smitswinkel
3. J11D – Roggeveld River
4. J11E – Wilgehout River

These catchments are characterised by several perennial water courses and drainage lines associated with the mainstem systems listed above.

The Present Ecological State scores (PES) for the drainage lines and the watercourses (see Figure 15) in the study area were rated as follows (DWS, 2014 – where A = Natural or Close to Natural & C = Moderately Modified):

Subquaternary Catchment Number	Present Ecological State	Ecological Importance	Ecological Sensitivity
8162	C	High	High
8244	B	High	High
8171	A	High	Very High
8258	A	High	Very High

It is thus evident that the study area systems are largely functional and or have limited impacts as a result of current land use practices. This was confirmed for each of the affected reaches located within the development footprint and in particular the areas that would be crossed by the proposed road layout. In other words, the systems observed are largely natural, with small or narrow riparian zones, dominated by *Searsia lancea* and *Vachellia karroo*. The only obligate species observed include small areas of *Juncus rigidus* and *Phragmites australis* associated with small pools created by road culverts found throughout the study area.

According to the National Freshwater Ecosystems Priority Area (NFEPA) wetland data, several large natural wetlands could occur within the study area. While the remaining waterbodies are artificial or man-made systems such as dams. However, the natural wetlands observed within the study area, as the potential wetlands observed were either farm dams / borrow-pits, are *Juncus* (Sedge) dominated valley bottom wetlands, some containing channels, while others, those associated with broader floodplains have no channels. These wetland areas, were dominated by impacts such as the dam, and the conversion to agricultural lands, thus most were Moderately Modified (PES = C), Largely Modified (PES = D) or somewhere between (PES = C/D).

These systems do still contain value in terms of acting as sponge areas within an arid environment, providing additional aquatic habitat (mostly for birds) and filtering any runoff during peak flow periods. For this reason, all the wetlands were rated as having a Moderate EIS Score. However, neither the development of the substation or the powerline is expected to affect these wetlands.

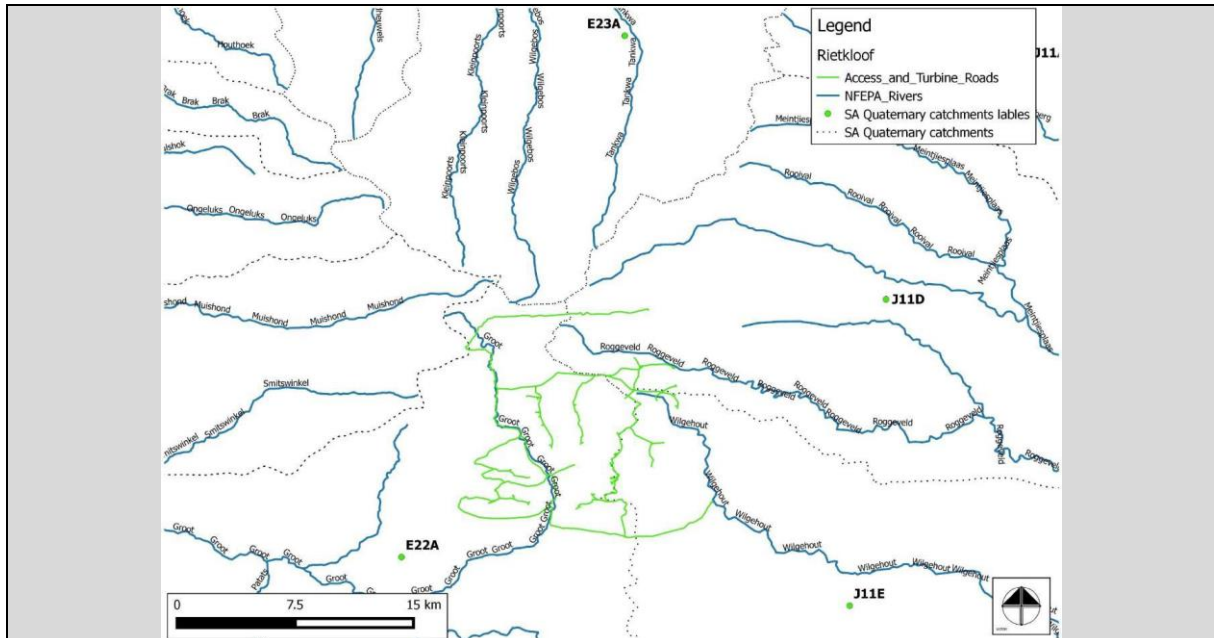


Figure 15: The project locality in relation to the various Quaternary Catchments and mainstream rivers as shown by NFEPA.

Appendix A provides a map of coordinates indicating all watercourse crossings for the proposed project. Please note that these indicate the worst case scenario as most watercourse crossings will not be affected as there will be micro-sitting undertaken within the 200m buffer.

6. LAND USE CHARACTER OF SURROUNDING AREA

Indicate land uses and/or prominent features that currently occur within a 500m radius of the site and give description of how this influences the application or may be impacted upon by the application:

Natural area	Dam or reservoir	Polo fields
Low density residential	Hospital/medical centre	Filling station ^H
Medium density residential	School	Landfill or waste treatment site
High density residential	Tertiary education facility	Plantation
Informal residential ^A	Church	Agriculture
Retail commercial & warehousing	Old age home	River, stream or wetland
Light industrial	Sewage treatment plant ^A	Nature conservation area
Medium industrial ^{AN}	Train station or shunting yard ^N	Mountain, koppie or ridge
Heavy industrial ^{AN}	Railway line ^N	Museum
Power station	Major road (4 lanes or more) ^N	Historical building
Office/consulting room	Airport ^N	Protected Area
Military or police base/station/compound	Harbour	Graveyard
Spoil heap or slimes dam ^A	Sport facilities	Archaeological site
Quarry, sand or borrow pit	Golf course	Other land uses (describe)

If any of the boxes marked with an “N” are ticked, how will this impact / be impacted upon by the proposed activity? Specify and explain:

Not applicable.

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If any of the boxes marked with an "An" are ticked, how will this impact / be impacted upon by the proposed activity? Specify and explain:

Not applicable.

If any of the boxes marked with an "H" are ticked, how will this impact / be impacted upon by the proposed activity? Specify and explain:

Not applicable.

Does the proposed site (including any alternative sites) fall within any of the following:

Critical Biodiversity Area (as per provincial conservation plan)	YES	
Core area of a protected area?		NO
Buffer area of a protected area?		NO
Planned expansion area of an existing protected area?		NO
Existing offset area associated with a previous Environmental Authorisation?		NO
Buffer area of the SKA?		NO

If the answer to any of these questions was YES, a map indicating the affected area must be included in Appendix A.

7. CULTURAL/HISTORICAL FEATURES

Are there any signs of culturally or historically significant elements, as defined in section 2 of the National Heritage Resources Act, 1999, (Act No. 25 of 1999), including Archaeological or paleontological sites, on or close (within 20m) to the site? If YES, explain:

YES

Heritage and Archaeological Resources

The proposed project area holds several historical features (stone walling kraals and cottages) some with associated historical artefacts situated along the access roads in the valleys and associated with the homestead settlements. The area, however, also held evidence of both Middle and Later Stone Age stone artefacts alongside water courses and on the flat floodplains. The heritage resources encountered are briefly explained below and depicted in Figure 16.

Precolonial / Stone Age material

Both Later Stone Age and Middle Stone Age stone artefact scatters were identified mainly on the flat floodplains up to the foot of the mountains as well as within the valleys along water courses. The artefacts were manufactured from fine-grained chalcedony material as well as hornfels and local shale raw materials.

No other cultural or organic archaeological heritage materials were assumed to be directly related or associated with the stone artefact scatters. In several instances stone artefacts would occur within the same vicinity as historical built environment structures, stone walling features as well as historical artefact scatters, similarly situated on the flat floodplains and within the valleys close to water courses.

Stone Walling Features

Up to three (3) stone walling features were documented along the access routes on the flat floodplains and in the valleys. These features include historical stone packed dwellings / cottages as well as kraals, pens, and a threshing floor. Historical artefacts were also located within the vicinity of some of the stone packed dwellings and kraals.

Historical Artefact Scatters

The historical artefacts scatter include fragments of glass, ceramics and metal material probably dating to the late 19th century. These scatters are mainly identified to be associated within the vicinity of stone packed dwellings / cottages and/or stone packed kraals.

Built Environment Structures

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These exclude structures that have been constructed by the historical stone packing method. The structures may be younger than 60 years and with very little or no heritage significance. These include abandoned buildings, used and unused reservoirs and drinking troughs. These structures occur across the landscape along the existing access roads.

The farm houses and associated buildings situated on the homestead / farm complex have been outlined and as a whole are considered as homesteads (described below).

Graves (formal and informal burials)

The historical family cemeteries are usually situated within close proximity or apart of the homestead. RKPL_G1 is a family cemetery situated across a watercourse from the Hartjieskraal homestead. RKPL_G2 resemble informal stone packed burials that may be associated with the ruins of a stone walling cottage situated in a valley next to a watercourse on the farm Hartjieskraal 77.

Homesteads / Farmhouse Complexes

Four homesteads / farm complexes were identified and demarcated where the proposed power line routes will pass. These have been demarcated purely for ease of reference, description and mitigation measures. Most of these homesteads / farm complexes include historically stone packed features including kraals and dwellings as well as nineteenth century farmhouses, modern buildings and typically historical graveyards. These earlier buildings and features have most likely been modified over time for maintenance purposes for continued and contemporary occupation. The homesteads are situated either adjacent to the proposed access roads or in some cases the proposed internal access roads are expected to go through the homesteads.

These homesteads include the farm house and associated staff accommodation, outbuildings and stone walling features and built environment structures.

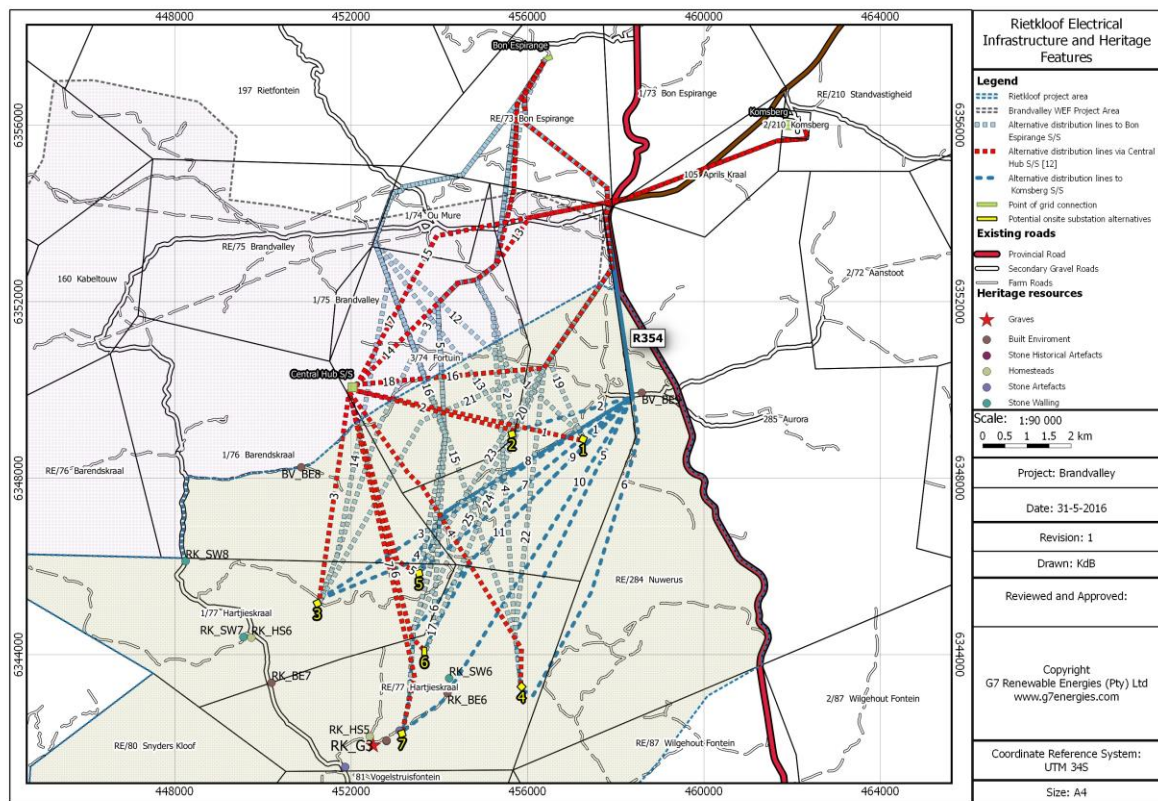


Figure 16: Rietkloof Electrical Infrastructure and relevant Heritage Resources.

Paleontological Resources

The study area lies in the mountainous Klein-Roggeveldberge region and is underlain by around twelve

formations of potentially fossil-bearing sedimentary rocks. The majority of the bedrocks are of Palaeozoic age (Early to Middle Permian) and belong to the Karoo Supergroup which is internationally famous for its rich fossil record. Palaeontological field assessment of the study area shows that in this portion of the south-western Karoo:

- **Dwyka Group and Lower to Middle Ecça Group** bedrocks in the low-lying, southern portion of the area are tectonically deformed and weathered, with low-diversity trace fossil assemblages of limited scientific interest. This also applies to the Whitehill Formation that elsewhere, outside the study area, may be of high palaeontological sensitivity.
- **Waterford Formation (Upper Ecça Group)** deformed bedrocks underlying the mountainous southern portion of the main development footprint are generally fossil-poor, apart from low-diversity trace fossil assemblages. However, isolated blocks and rare logs of well-preserved petrified wood found within the eastern portion of the study area are of high scientific and conservation value.
- **Abrahamskraal Formation (Lower Beaufort Group)** fluvial bedrocks underlying the high-lying northern portion of the study area are generally considered to be of high palaeontological sensitivity. However, in this area of the SW Karoo they are fossil-poor, apart from occasional horizons with plant debris or low-diversity trace fossils, including unconfirmed large tetrapod (terrestrial vertebrate) burrows. Fossil vertebrate skeletal remains (bones, teeth) are very rare indeed in these lowermost Beaufort Group rocks. None have been recorded as yet within the Rietkloof WEF study area, but isolated occurrences of probable small dicynodonts have recently been found just to the north (Brandvalley WEF project area).
- **Late Caenozoic superficial sediments (alluvium, colluvium, calcretes, soils, surface gravels etc)** overlying the Palaeozoic bedrocks are of low palaeontological sensitivity. Pediment and surface gravels along the foot of the Klein-Roggeveld Escarpment locally contain numerous clasts of petrified wood reworked from the Karoo Supergroup outcrop area to the north.

It is recommended that a palaeontologist conducts monitoring during the construction period in areas identified with high sensitive formations.

If uncertain, conduct a specialist investigation by a recognised specialist in the field (archaeology or palaeontology) to establish whether there is such a feature(s) present on or close to the site. Briefly explain the findings of the specialist:

Not applicable.

Will any building or structure older than 60 years be affected in any way?

Is it necessary to apply for a permit in terms of the National Heritage Resources Act, 1999 (Act 25 of 1999)?

	NO
	NO

If YES, please provide proof that this permit application has been submitted to SAHRA or the relevant provincial authority.

8. SOCIO-ECONOMIC CHARACTER

a) Local Municipality

Please provide details on the socio-economic character of the local municipality in which the proposed site(s) are situated.

The Rietkloof project is located within the Western Cape Province and falls into the Central Karoo District Municipality (Laingsburg Local Municipality) and in the Namakwa District Municipality (Karoo Hoogland Local Municipality) in the Northern Cape. The socio-economic environment of these municipalities are expanded on briefly below.

KAROO HOOGLAND LOCAL MUNICIPALITY

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Level of unemployment:

Of those sampled (of ages between 15 and 64) during the 2011 census, 3,655 were employed, 623 were unemployed and 395 were classified as discouraged work seekers and 3 170 are economically inactive. Unemployment rate in this district is at 14.6% and unemployment rate for the youth (between the ages 15-34) is at 20%. The Northern Cape unemployment rate was at 31.3% and the South African unemployment rate was 25% during the same survey, as shown in Figure 17 below.

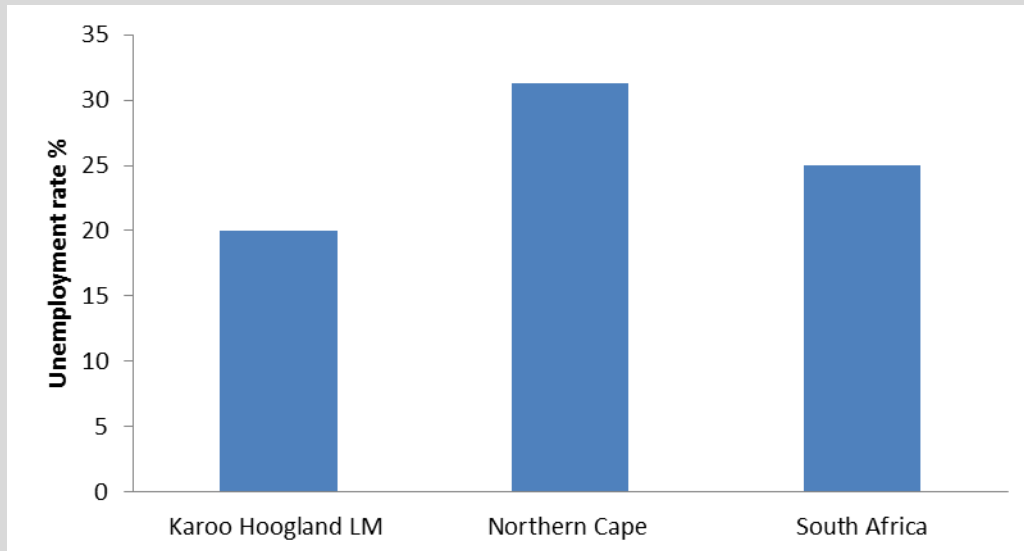


Figure 17: Graph illustrating the unemployment rate of the Karoo Hoogland Local Municipality in relation to the Northern Cape and National rate.

Economic profile of local municipality:

The Karoo Hoogland Local Municipality is found in the Namakwa District Municipality in the Northern Cape province. Three main towns occur in this local municipality, namely Fraserberg, Sutherland and Williston. This project occurs near the Sutherland area of this Municipality.

Population demographics indicate that the area is made up by 78.9% of the coloured population 14.6% white population and the remaining 6.5% being black African and Asian/Indian population. Afrikaans is the predominant language spoken in this municipality where 90.2% of the population are Afrikaans speakers.

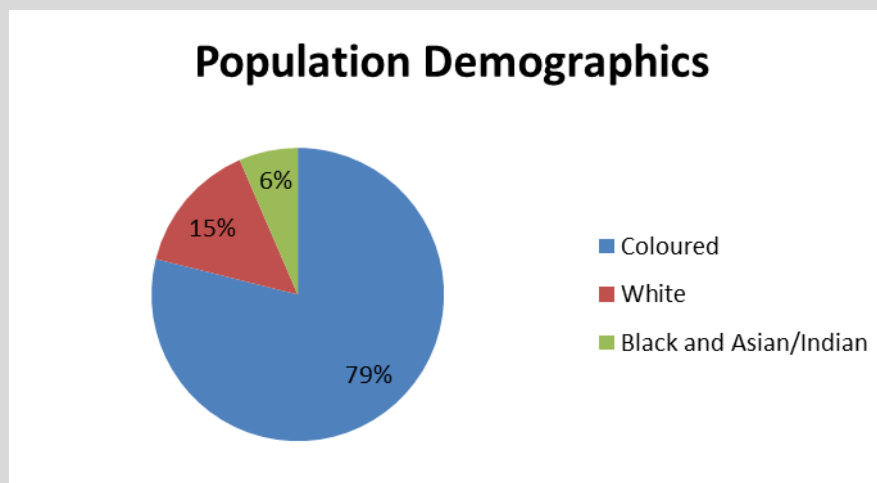


Figure 18: Graph illustrating the Population demographics of the Karoo Hoogland Local Municipality.

Households

2011 data indicates that the municipality had approximately 3, 842 households, which on average had approximately 3 people per household. 96.6% of these households are formal dwellings, 47.3% are owned or being paid off and 30.6% are female-headed households (StatsSA, 2011).

Basic Services

Data for basic services available within this municipality show that 59.8% of households have access to piped water in their dwelling and between 46.4% and 64.9% use electricity for heating, cooking and lighting. Other sources of fuel or energy include wood where 22.6% of households use it for cooking while 38.4% use it as a source of heating. 39.4% dwellings have flush toilet connected to sewerage and 62.7% have weekly refuse removal. According to the Karoo Hoogland Municipality Revised IDP 2014-2015, there is only one registered landfill site and two that are permitted and are in the process of being registered. In contrast, the South African Waste Information Centre (SAWIC) shows that only two waste facilities have licences in this local municipality and both are facilities for the treatment of effluent, wastewater or sewerage.

Health Access

Three clinics and two mobile clinics are found to occur in the Karoo Hoogland Local Municipality. The health services in this local municipality are inadequate due to the lack of doctors, ambulances and poor road infrastructures in some of the areas. Data for this municipality indicate that it has a high risk of drought and a high vulnerability to poverty and poor health services, roads and telecommunication all these are contributing factors that may affect the health status of the community.

Level of education:

The education status of this municipality was determined by surveying those which were 20 years and older. Results indicated that 5,7 % had no form of schooling, 48.1% had some primary school level education, 7.7% completed primary education, 24.2% have some secondary education, 6.2% have completed matric and 0.6% have some form of higher education. The Northern Cape (in which this municipality is found) has an annual growth of 2.1% contributing 2.0% to the National GDP, which was 2.2% in 2013.

LAINGSBURG LOCAL MUNICIPALITY

The Laingsburg LM consists of three communities namely the:

- Laingsburg town with a population of 5,973 constituting the majority (67%) of the municipality.
- Matjiesfontein, a small community that has about 422 people (6%) of the total population in this municipality.
- The remaining population of 2,304 people (27%) resided on farms in various areas of the local municipality (IDP, 2013).

Households:

2011 data indicates that the municipality consisted of about 2,408 households, which on average had about 3.3 persons per household. 96% of these households are formal dwellings, 36.2% are owned or are being paid off and less than one third (31%) are female headed households.

Level of unemployment:

Unemployment rate in this district improved as it decreased from 26.3% (2001 census) to 17.9%, (Census, 2011) (StatsSA, 2011). The improvement in the employment rate may have been due to contract basis work, thus the results may not be reflecting the true current status of the municipality (IDP, 2013). This rate is slightly lower than the provincial unemployment of rate (22.2%) measured in January to March 2011; the South African unemployment rate was 25% during the same survey. Employment opportunities in this municipality are largely

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from the Agricultural Sector.

Basic services:

Data for basic services in this municipality show that 92.7% of these households have access to piped water either in their dwelling or in their yard, whilst 0.6% did not have access to piped water at all. Electricity in this region is said to be lacking where 79.4% of households have access to electricity, other sources of energy such as solar energy are used in this district. 68.1% of the dwellings have flush toilet infrastructure connected to sewerage and 59.5% have weekly refuse removal. According to the South African Waste Information Centre (SAWIC), three waste facilities are found in this municipality. Two sites are for the disposal of general waste and a single waste water treatment facility.

Education:

During the 2011 census, the education status of the area was determined by surveying those which were 20 years and older. Results indicated that 10,2% had no form of schooling, 7.7% only had primary school level education, 34.3% have some secondary education, 21.5 % have completed matric, 7% have some form of higher education.

Health Access:

A number of health facilities are found to occur in the Laingsburg LM, including the Laingsburg Hospital, Laingsburg clinic, Matjiesfontein Satellite Clinic and the Laingsburg Mobile Clinic. Other facilities in Laingsburg include Emergency Medical Services Ambulance Stations and Forensic Pathology Laboratories (Mortuaries). Thus there is only one health facility (Matjiesfontein Satellite Clinic) in the Matjiesfontein area. This municipality is said to be one of the most deprived in the Province. (APP, 2014).

b) Socio-economic value of the activity

What is the expected capital value of the activity on completion?	Cannot be confirmed at this stage as it depends on the alternative approved, but approximately R2million per kilometre of line.
What is the expected yearly income that will be generated by or as a result of the activity?	The project will not generate any income directly, but will indirectly through connecting the Rietkloof WEF to the national grid.
Will the activity contribute to service infrastructure?	YES
Is the activity a public amenity?	NO
How many new employment opportunities will be created in the development and construction phase of the activity/ies?	Approximately 20 (construction),
What is the expected value of the employment opportunities during the development and construction phase?	The exact amount depends on the contractor appointed.

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What percentage of this will accrue to previously disadvantaged individuals?

This will depend on the contractor appointed to undertake the construction work.

How many permanent new employment opportunities will be created during the operational phase of the activity?

Approximately 2-4 (operation phase). Eskom will be responsible the operation and maintenance of the power line.

What is the expected current value of the employment opportunities during the first 10 years?

The exact amount depends on Eskom as they will be responsible for the operation and management of the distribution line and substation.

What percentage of this will accrue to previously disadvantaged individuals?

During operation the maintenance will be undertaken by Eskom. It is part of Eskom's mandate to provide employment opportunities to previously disadvantaged individuals.

9. BIODIVERSITY

Please note: The Department may request specialist input/studies depending on the nature of the biodiversity occurring on the site and potential impact(s) of the proposed activity/ies. To assist with the identification of the biodiversity occurring on site and the ecosystem status consult <http://bgis.sanbi.org> or BGIShelp@sanbi.org. Information is also available on compact disc (cd) from the Biodiversity-GIS Unit, Ph (021) 799 8698. This information may be updated from time to time and it is the applicant/ EAP's responsibility to ensure that the latest version is used. A map of the relevant biodiversity information (including an indication of the habitat conditions as per (b) below) and must be provided as an overlay map to the property/site plan as Appendix D to this report.

- a) **Indicate the applicable biodiversity planning categories of all areas on site and indicate the reason(s) provided in the biodiversity plan for the selection of the specific area as part of the specific category)**

Systematic Biodiversity Planning Category				If CBA or ESA, indicate the reason(s) for its selection in biodiversity plan
Critical Biodiversity Area (CBA)	Ecological Support Area (ESA)	Other Natural Area (ONA)	No Natural Area Remaining (NNR)	<u>Within the study area, the extensive CBA within the Western Cape portion of the site is based on several different criteria. A large proportion of this CBA is related to the fact that it has been identified as a priority area within the National Protected Area Expansion Strategy for South Africa (NPAES). This area was identified as a</u>

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			<p><u>priority area on the grounds that apart from being an extensive tract of unfragmented natural vegetation, it is also an area of high climate and landscape variation which is likely to be resilient to climate change. Such areas are likely to be more climatically stable over time, providing refugia where plants and animals can persist. As such, it is important to recognize that the site is therefore not replaceable due to the fact that there are not similar areas that can perform the same function and which contain a similar set of species available elsewhere. In addition, the highest-lying ridges are considered most important in terms of ecological patterns and processes in the area and these occupy a very small proportion of the site with the result that these are likely to experience a disproportionate impact from the development which also targets these areas for development.</u></p> <p><u>Overall, the CBA maps for the study area are considered inadequate for use at a fine scale and the data collected on-site is considered to be of greater weight than the CBA status. Therefore, the CBA status of the site is considered secondary to the actual assessed biodiversity status of the different parts of the site. Within the Western Cape, the higher ridges are identified as the most important and the lower lying areas are generally considered significantly less sensitive. Where CBAs have been designed for connectivity and not to capture high biodiversity areas, they are less vulnerable to habitat loss and in the current case, there are significant gaps in the strings of turbines and it is not likely that the development would disrupt the connectivity of the landscape for the majority of species.</u></p> <p><u>In terms of the impact of the development on the NPAES Focus Area, the total extent of habitat lost to the current development is not highly significant and would not compromise the overall availability of land to meet conservation goals within the affected NPAES. However, the density of renewable energy developments in the area is high and the cumulative impact of development may have an impact on future conservation options in the area. It is however also pertinent to consider the extent to which wind energy development is compatible with biodiversity conservation. The actual footprint of the development is low and the majority (98%) of the affected area will remain intact. With mitigation and avoidance, the impact on vegetation and plant species can be reduced to an acceptable level and as such, the development can be</u></p>
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				<p><u>considered compatible with the maintenance of plant diversity. The area is a priority area for flora and there are no faunal species within the development area that are a very high conservation priority, the overall impact on biodiversity features of concern would be relatively low. Furthermore, as the total footprint of the development is low, the potential for future rehabilitation of the area after decommissioning of the facility is high and so in the long-term, the potential future conservation value of the area would remain largely intact.</u>¹¹</p>
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b) Indicate and describe the habitat condition on site

Habitat Condition	Percentage of habitat condition class (adding up to 100%)*	Description and additional Comments and Observations (including additional insight into condition, e.g. poor land management practises, presence of quarries, grazing, harvesting regimes etc).
Natural	70%	The majority of the affected area consists of natural vegetation used for extensive livestock grazing. The majority of the site can be considered to be in a moderate to good condition. Alien plant abundance is low.
Near Natural (includes areas with low to moderate level of alien invasive plants)	20%	There are some road verges and power line servitudes along the distribution line routes, which show various levels of disturbance and vegetation clearance. Impacts from grazing has also reduced the overall condition of the natural veld in certain areas.
Degraded (includes areas heavily invaded by alien plants)	5%	Certain areas have been cleared around homesteads for farming activities, such as feeding pens and troughs.
Transformed (includes cultivation, dams, urban, plantation, roads, etc)	5%	There are some roads and power lines along the distribution line route, where the vegetation has been transformed for infrastructure. These do comprise a low proportion of the study area.

*please note that the percentages are estimations and not confirmed by an ecologist.

c) Complete the table to indicate:

- (i) the type of vegetation, including its ecosystem status, present on the site; and
- (ii) whether an aquatic ecosystem is present on site.

Terrestrial Ecosystems		Aquatic Ecosystems			
Ecosystem threat status as per the National Environmental Management: Biodiversity Act (Act No. 10 of 2004)	Critical	Wetland (including rivers, depressions, channelled and unchannelled wetlands, flats, seeps pans, and artificial wetlands)	Estuary	Coastline	
	Endangered				
	Vulnerable				
	Least Threatened				
	YES		NO		NO

¹¹ Todd, S. Environmental Impact Assessment for the Proposed Rietkloof Wind Energy Facility: Fauna & Flora Specialist Impact Assessment Report.

- d) Please provide a description of the vegetation type and/or aquatic ecosystem present on site, including any important biodiversity features/information identified on site (e.g. threatened species and special habitats)

Vegetation

Broad-Scale Vegetation Patterns

According to the national vegetation map (Figure 19), the vast majority of the power line routes are within the Central Mountain Shale Renosterveld vegetation, while only a small area around the Komsberg substation and in the far south of the study area fall within the Koedoesberge-Moordenaars Karoo vegetation type. In the south, one of the on-site substation options (Option 7) is within the Tanqua Wash Riviere vegetation type.

Central Mountain Shale Renosterveld occurs in the Western and Northern Cape on the southern and southeastern slopes of the Klein Roggeveldberge and Komsberg below the Komsberg section of the Great Escarpment as well as farther east below Besemgoedberg and Suurkop and in the west in the Karookop area. It is associated with clayey soils overlying Adelaide Subgroup mudstones and subordinate sandstones with land types mostly Ib and Fc. Although this vegetation type is classified as Least Threatened, it has a very limited extent of 1236km² and is not formally conserved anywhere. Levels of transformation are however low and it is considered to be 99% intact. Although no endemic species are known to occur within this vegetation type, little is known about this Renosterveld type and it has been poorly sampled. Experience from this and other projects in the area indicate that this should be considered to be a relatively sensitive vegetation type with a relatively high abundance of species of conservation concern and in context of the site should in fact be considered to have a higher sensitivity than those areas of Koedoesberge-Moordenaars Karoo. The Komsberg area is also a recognized centre of plant diversity and endemism and the majority of this diversity is associated with the high elevation areas of Central Mountain Shale Renosterveld.

Within the site, dominant species include shrubs such as *Ruschia intricata*, *Eriocephalus microphyllus* var. *microphyllus*, *Chrysocoma ciliata*, *Hirpicium alienatum*, *Asparagus capensis*, *Amphiglossa tomentosa*, *Pteronia ciliata*, *Pteronia sordida*, *Pentzia incana*, *Tripterys sinuata* and *Oedera genistifolia*, grasses including *Ehrharta calycina* and *Merxmeullera stricta* and succulents such as *Tylecodon wallachii* and *Crassula tetragona* subsp. *connivens*. There is a clear change in the vegetation discernible above 1350m, where the cooler and wetter conditions results in a change in composition compared to the lower elevation areas. Although the vegetation is broadly similar in terms of the dominant species as listed above, species which characterise these areas which are not present or uncommon at lower elevations include *Rosenia spinescens*, *Eriocephalus grandiflorus* (Rare), *Ehrharta eburnea* (NT) and *Tribolium purpureum*, *Pelargonium griseum*, *Zygophyllum spinosum*, *Berkheya heterophylla* var. *heterophylla* and *Ruschia lineolata*. Although it was dry at the time of the site visit, indications are that the abundance of geophytes and other species of potential concern are significantly higher within this habitat than on the lower-lying areas.

Although the Tanqua Wash Riviere vegetation type has been mapped only along the Groot River in the far south of the site, it is also associated with the other major drainage lines of the study area. This vegetation unit is associated with the Alluvia of the Tanqua and Doring Rivers and sheet-wash plains of their less important tributaries embedded largely within the Tanqua Karoo vegetation unit. It consists of a mosaic of shrublands with *Salsola* and *Lycium* alternating with *Acacia karoo* gallery thickets. It is classified as Least Threatened and is considered moderately-well conserved as 13% of the target 19% falls within the Tanqua National Park and other nature reserves. It has not been heavily impacted by transformation and more than 95% is still intact. At a broad level, this is considered to be sensitive vegetation type as it is vulnerable to disturbance and being associated with drainage lines is ecologically important for a variety of ecological services and processes. In addition, the Riverine Rabbit *Bunolagus monticularis* which is listed as Critically Endangered is known to occur within this vegetation unit in the broad area and may occur along the southern margin of the site associated with this vegetation unit, but has not been recorded from this area and so this considered unlikely.

The smaller drainage lines in the higher lying parts of the site are considered distinctive from the Tanqua Wash

Riviere, which is associated with low-lying areas of the Tanqua and Western Karoo and is usually characterised by broad silty floodplains due to the low slope. Although many of the drainage lines of the site in the higher lying areas are small and not well developed, some of the larger drainage lines have well developed associated wetlands with extensive reed beds and in the lower reaches, where the rivers become more confined, there is usually a well-developed woody component. Dominant and common species include *Pseudoschoenus inanis*, *Athanasia minuta* subsp. *inermis*, *Felicia filifolia*, *Lycium cinereum*, *Euryops imbricatus*, *Dicrothamnus rhinocerotis*, *Phragmites australis*, *Conyza scabrida*, *Mentha longifolia* subsp. *capensis*, *Artemisia afra* and trees such as a *Searsia lancea*, *Salix mucronata* and *Acacia karoo*. Some significant populations of *Brunsvigia josephinae* (VU) were observed in the wetlands at the site in close proximity to the existing access roads and if the development goes ahead then specific attention would need to be paid to avoiding the plants near to powerline infrastructure as well as ensuring their long-term protection from harvesting.

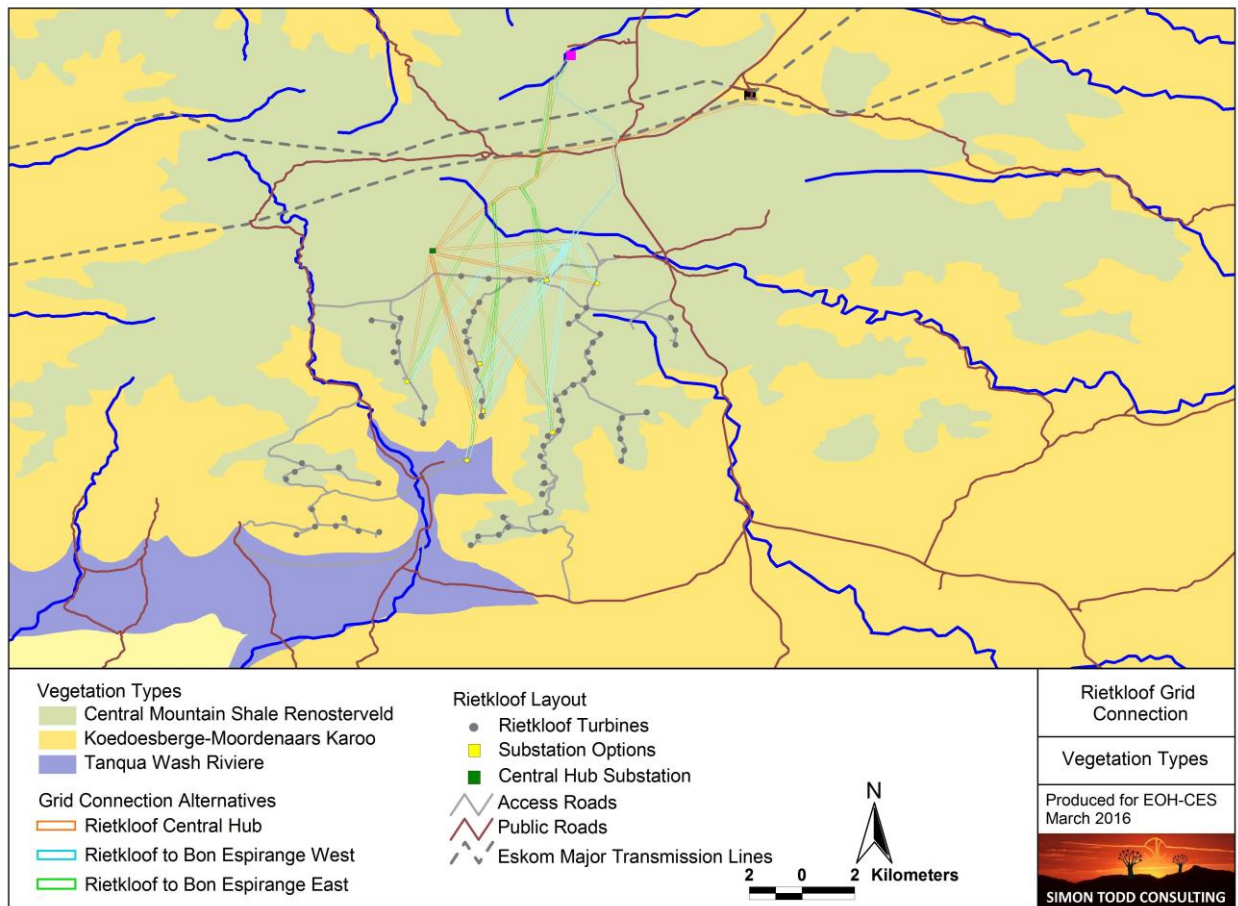


Figure 19. Vegetation map (Mucina and Rutherford 2006) of the Rietkloof Wind Farm electrical infrastructure footprint. The majority of the affected area falls within the Central Mountain Shale Renosterveld with marginal impact on Koedoesberge-Moordenaars Karoo near the Komsberg substation.

According to Mucina and Rutherford (2006) the Koedoesberge-Moordenaars Karoo vegetation type has an extent of 4714km². This unit occurs in the Western and Northern Cape on the Koedoesberge and Pienaar se Berg low mountain ranges bordering on the southern Tanqua Karoo and separated by the Klein Roggeveld Mountains from the Moordenaars Karoo in the broad area of Laingsburg and Merweville. Koedoesberge-Moordenaars Karoo is associated with slightly undulating to hilly landscape covered by low succulent scrub with scattered tall shrubs. It occurs on mudstones, shale and sandstone of various origins including Adelaide Subgroup, Ecca Group and Dwyka Group diamictites, which give rise to shallow skeletal soils. Land types are mainly Fc and lesser extents of Ib. This vegetation type is classified as Least Threatened and has not been significantly impacted by transformation. Conservation status is however poor and of the target of 19% only a very small proportion is conserved within the

Gamkapoort Nature Reserve (<1%). At least 14 endemic species are known from this vegetation type, which is a high number considering that this vegetation unit occupies less than 5000km². In addition, the majority of listed species known from the broader area are associated with this vegetation type. It is however very poorly known and little research has been conducted within this unit. The impact on this unit would however be minimal as it occurs only in the immediate vicinity of the Komsberg substation.

Site Description

In this section, various typical and important features and sections of the different parts of the site and power line corridor alternatives are illustrated and described in detail to provide context for the assessment.



Plate 7: Approach to the Komsberg substation, showing low renosterveld and karroid scrub of the Koedoesberge-Moordenaars Karoo vegetation type. The lower-lying areas generally have a lower abundance of species of conservation concern than the higher lying ground. This area would be affected by the two options from the central hub to Komsberg substation.



Plate 8: Looking back along the power line corridors from the site of the Bon Espirange substation area. The vegetation on the plains is dense renosterbos, *Elytropappus rhinocerotis* and in this site it also indicative of past disturbance and much of affected area around the substation has been ploughed in the past.



Plate 9: Central part of the site, near the site of the Rietkloof central hub substation. The existing 400kV line is visible traversing the plain in the distance. This vegetation is considered consistent with the Central Mountain Shale Renosterveld vegetation type of Mucina & Rutherford (2006).



Plate 10: Although the vegetation in the south of the site is classified as Central Mountain Shale Renosterveld, it is a lot more Karroid in nature than the higher lying areas to the north and contains fewer species of conservation concern. This is the typical vegetation within substation options 3, 7 and 4, and to a lesser extent 5 and 6, which are on slightly higher lying ground.



Plate 11: The eastern margin of the site, showing the area near to Fortuin that would be affected by substations options 1 and 2.



Plate 12: Typical drainage line in the south of the site, with well-developed *Acacia karoo* and *Searsia lancea* in the channel with occasional *Salix mucronata* and patches of *Phragmites australis*.

Alien Plant Species

The majority of the site is currently free of, or has low abundance of, alien species. There are however disturbed areas around farmsteads, old croplands and livestock watering points which harbor a variety of alien species. Mesquite, *Prosopis* spp. is common at most farmsteads and is a potential problem especially in lowlands habitats around the site and is a potentially significant invader as it can alter hydrological function under dense invasion. Other common invasive and indigenous weedy species observed at the site include *Bromus* spp., *Lolium* spp. *Avena fatua*, *Salsola kali*, *Dittrichia graveolens*, *Amsinckia retrorsa* and *Conyza bonariensis*.

Listed & Protected Plant Species

According to the SANBI SIBIS database, nearly 681 indigenous species have been recorded from the four quarter degree squares around the site. This includes 61 threatened species and an additional 101 species of lower conservation concern. Although this is a considerably larger area than the study area and includes a wide variety of habitats, many of which are not found within the study area, this is an exceptionally high number for a semi-arid environment. This serves to illustrate the high species richness of the area and high potential impact of the development on plant species of conservation concern.

The only species of conservation concern that were observed at the site were *Brunsvigia josephinae* (VU), *Eriocephalus grandiflorus* (Rare) and *Ehrharta eburnea* (NT), but it is certain that there are a number of additional species present as well. Species of concern are likely to be concentrated along the alluvial soils of the drainage lines and on the high-lying ridges of the site above 1350m.

Apart from the red data listed species, there are many provincially protected species present at the site. Within the Western Cape these are listed within the *Western Cape Nature Conservation Laws Amendment Act of 2000*. Of particular relevance are the following, which highlights some of the plant genera and families commonly encountered at the site, but is not intended to be a comprehensive list.

Schedule 4 Protected Flora:

- *Amaryllidaceae* – All species
- *Lachenalia* – All Species
- *Iridaceae* – All Species
- *Mesembryanthemaceae* – All species

Within the Northern Cape, the situation is similar and under the Northern Cape Nature Conservation Act of 2009 the following families and genera are protected.

Schedule 1: Specially Protected Flora

- Family GERANIACEAE - *Pelargonium* spp. all species

Schedule 2 Protected Flora

- *Amaryllidaceae* – All species
- *Apiaceae* – All Species
- *Apocynaceae* – All Species
- *Asphodelaceae* – All species except *Aloe ferox*
- *Iridaceae* – All species
- *Mesembryanthemaceae* – All species
- *Capparaceae* - *Boscia* spp. Sheperd's trees, all species
- *Androcymbium* spp. - All species
- *Crassulaceae* - All species except those listed in Schedule 1
- *Euphorbiaceae* - *Euphorbia* spp. All species
- *Oxalidaceae* - *Oxalis* spp All species
- *Portulacaceae* - *Anacampseros* spp. All species

However, it is important to note that these acts are intended to protected rare and endemic or otherwise significant species and not common and widespread species which may form the dominant species over large parts of the site. A final list of affected species would be identified through a walk-through of the final development footprint prior to construction and would be a requirement for provincial permitting of the development.

Critical Biodiversity Areas & Broad Scale Ecological Processes

The site itself lies with the Western Cape Province, along the boundary of the Northern Cape as well as along the boundary between the Central Karoo and Winelands District Municipalities within the Western Cape. As a result, the site lies at the junction of three different conservation plans and Figure 20 below is a composite of all these different plans. The project falls entirely within the Western Cape within the Biodiversity Assessment of the Cape Winelands

District Municipality (Skowno et al. 2009). These district-wide biodiversity assessments were commissioned to inform Spatial Development Frameworks (SDFs), Biodiversity Sector plans, Environmental Management Frameworks (EMFs), Strategic Environmental Assessments (SEAs) and the Environmental Impact Assessment (EIA) process. The Biodiversity Assessments identify Critical Biodiversity Areas (CBAs) which represent biodiversity priority areas which should be maintained in a natural to near natural state. The CBA maps indicate the most efficient selection and classification of land portions requiring safeguarding in order to meet national biodiversity objectives. Once gazetted, and incorporated into municipal SDFs and bioregional plans, such fine-scale plans are recognized under NEMA and the various activities listed under the act come into effect. The CBA map for the general area surrounding the site is depicted below in Figure 20.

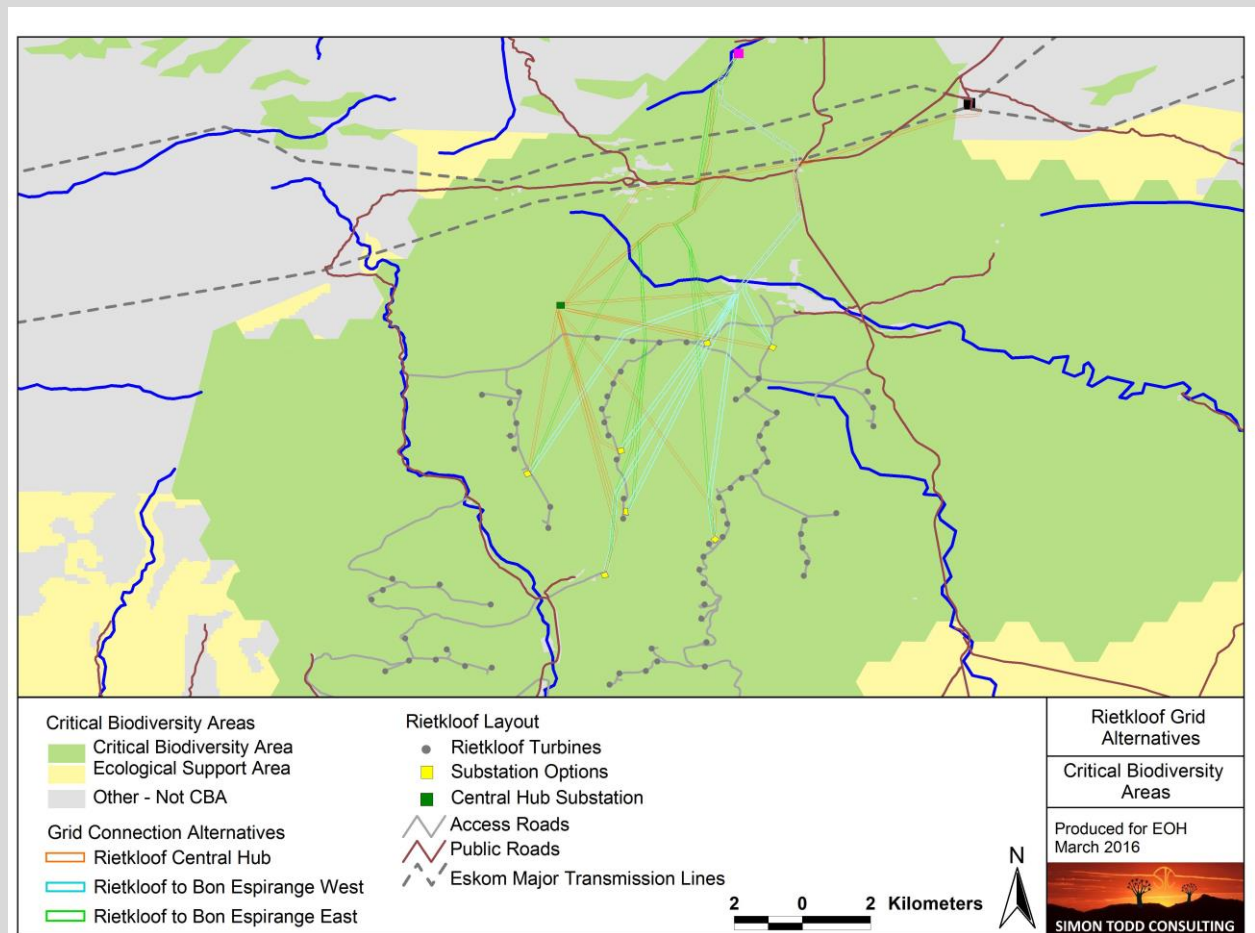


Figure 20: Amalgamated Critical Biodiversity Areas map of the proposed Rietkloof Wind Farm powerline options and the surrounding area.

Given that the objective of CBAs is to identify biodiversity priority areas which should be maintained in a natural to near natural state, development within these areas is not encouraged and may not be compatible with the objectives of the CBA. The likely implications and impacts of development within the CBAs and their immediate environment is a potential concern for the Rietkloof powerline development that needs to be carefully addressed as all three powerline route options fall within a CBA. Pertinent issues in this regard include establishing why the area has been identified as a CBA and if there are any mitigation measures that can be implemented that can significantly reduce or avoid impacts to the CBAs.

Although development within a CBA is not desirable, the footprint of the power lines within the CBA would be small and is therefore not likely to significantly impact on the biodiversity or ecological functioning of the CBA. Within vegetation types that are highly transformed, CBAs include a large proportion of irreplaceable vegetation fragments that cannot be substituted. However, within the study area, all the vegetation types present are mainly natural (i.e. very little transformation), with both Koedoesberge-Moordenaars Karoo and Central Mountain Shale Renosterveld

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being 99% intact. Within semi-arid areas where the majority of vegetation is natural, there are often many choices as to which areas could fall under CBAs and the final solution may be a design issue rather than a clear-cut biodiversity-priority one. Where CBAs have been designed for connectivity and not to capture high biodiversity areas, they are less vulnerable to habitat loss and in the current case, the low footprint of the powerlines would not disrupt the connectivity of the landscape to any significant degree.

SECTION C: PUBLIC PARTICIPATION

The public participation process undertaken during this BA process is in line with the requirements of Regulation 41 of the EIA Regulations.

Interested and Affected Parties (I&APs) play an important role in the BA process, as many of their concerns and issues can be included in the project proposal, to ensure a development which is as environmentally and socially acceptable as possible. There are four key steps in the PPP to ensure that I&APs are informed of the proposed development and afforded sufficient opportunity to raise comments and or concerns. These include:

- a. Identifying potential I&APs;
- b. Notifying I&APs through:
 - i. Advertisement and site notices;
 - ii. Written notices;
 - iii. Public meeting;
- c. Making provision for I&APs to review and comment on all draft reports before they are finalised and submitted to the competent authority; and
- d. Compiling a record of responses to any comments and concerns provided by the I&APs and including and addressing these concerns in final reports.
- e.

Since the two BA processes are intended to run concurrently, some tasks for the PPP was combined for Brandvalley and Rietkloof BAs. Adverts and public meetings remained combined.

1. ADVERTISEMENT AND NOTICE

Publication name	<ul style="list-style-type: none"> • <i>Die Burger</i> • <i>Worcester Standard</i> 	
Date published	<ol style="list-style-type: none"> 1. <i>Die Burger</i> – 16 March 2016 2. <i>Worcester Standard</i> – 17 March 2016 	
Site notice position	Latitude	Longitude
	32°56'56.66"S	20°32'59.44"E
	32°57'16.44"S	20°31'16.27"E
Date placed	12 February 2016	

Include proof of the placement of the relevant advertisements and notices in Appendix E1.

2. DETERMINATION OF APPROPRIATE MEASURES

Provide details of the measures taken to include all potential I&APs as required by Regulation 41(2)(e) and 41(6) of GN 733.

Initial PPP and BID circulation

The public participation process to date included:

- Erecting two site notices on-site (see Section C (1) above);
- Identifying property owners and neighbours and sending notifications of the proposed project to such land owners via email or mail (whichever most appropriate). A database comprising of all the relevant interested persons/ organisation was compiled together with their contact details to inform them of the initiation of the project;

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- One regional and one local newspaper advertisements were placed (see Section C (1) above);
- Distribution of Background Information Documents and Notification letters to I&APs in English on 23 March 2016.

A copy of the comments and responses report is included in Appendix E including all comments received to date along with responses from the EAP and applicant.

DBAR

The Draft Basic Assessment Report (DBAR) was circulated for a 30-day comment period from **6 June 2016 until 6 July 2016** to allow all I&APs to comment. The report was made available as follows:

4. Placement of hard copies of the DBAR at the Laingsburg Public Library (Van Riebeeck Street, Laingsburg) and the Touws River Public Library (Corner Jane and Logan Streets Touws River).
5. Hard/ electronic copies were circulated to organs of state to request comments.
6. Electronic copies were available from the link (<http://data.g7energies.com/ba/rietkloof>)

A public meeting was held at the Laingsburg Flood Museum on the 22nd of June 2016, during the review period of the DBAR, in order to provide feedback regarding the findings of the study. All identified I&APs were invited to attend. The meeting was attended by only one I&AP.

DEA Decision

All registered I&APs will be informed through written notification of the DEA decision within 14 days from the date of issuing the EA.

Key stakeholders (other than organs of state) identified in terms of Regulation 41(2)(b) of GN 733

Please see the I&AP database included in Appendix E.

Include proof that the key stakeholder received written notification of the proposed activities as Appendix E2. This proof may include any of the following:

- e-mail delivery reports;
- registered mail receipts;
- courier waybills;
- signed acknowledgements of receipt; and/or
- or any other proof as agreed upon by the competent authority.

Please see Appendix E.

3. ISSUES RAISED BY INTERESTED AND AFFECTED PARTIES

All comments received during the BID review period are captured and recorded within the Comments and Response Report attached as Appendix E.

Summary of main issues raised by I&APs	Summary of response from EAP and Applicant
Rhyno Gouws requested clarity on the layout drawings provided in the BID for the proposed Brandvalley and Rietkloof projects.	Clarity was provided on the layout indicating that the maps included both the Rietkloof and Brandvalley 132kV project footprints. The illustration provided in the BID aimed to inform the I&APs of the project, provide location and preliminary layout as an overview of the projects and the property portions involved. A link was provided to a provisional/ preliminary distribution line alternative map providing more detail for each project.
Andries le Roux, a landowner, commented on the preliminary layout provided in the BID requesting that areas between points A, B, C and D were excluded from any wind farm activities.	The comment provided by Andries le Roux was taken into considered when determining the layout for the wind energy facility and the power lines.

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<p><u>Cape Nature queried the split in the applications for Brandvalley and Rietkloof and requested hard copies and electronic copies of the main report and specialist studies.</u></p>	<p><u>Clarity was provided on the application process explaining that there are two Basic Assessment Applications for the 132kV distribution line component of the proposed Brandvalley and Rietkloof Wind Farms. Hard copies and electronic copies of the DBAR were provided to Cape Nature.</u></p>
<p><u>BirdLife SA have indicated that the Basic Assessment should recognise the collision and electrocution risk that power lines represent to birds, particularly larger species which may be of great conservation value. BirdLifeSA requested that the routing of the lines take into account any known data regarding bird nesting and roosting sites, flight paths between wetlands and roosting areas and any areas that are considered to be protected areas, including the BirdLife International Important Bird and Biodiversity network. Every effort should be made to avoid such areas to minimise collision risk.</u></p> <p><u>Furthermore, lines and pylons should be designed in such a way to deter birds from their use as perching and nesting sites, including the addition of bird flight diversion infrastructure to the lines where necessary.</u></p>	<p><u>These concerns were noted and communicated to the avifaunal specialist.</u></p> <p><u>The avifaunal specialist reported that no roosting sites were observed on site. The specialist did however note a potentially sensitive flight path between two of the larger farm dams. Since this flight path was not confirmed, the precautionary principle was applied. The distribution lines crossing this flight path were rerouted to avoid collision and electrocution risk. Furthermore, bird flight diverters will be placed along the lines crossing any valley to reduce collision risk, as per the mitigation measures provided by the specialist. See Appendix D of the FBAR for the avifaunal impact assessment.</u></p>
<p><u>Anne Flynn from Oil & Gas Ltd requested to be registered as an Interested and Affected Party for the project as Falcon have a TCP over the same area and therefore wish to be informed on the progress of the project to ensure that both projects can co-exist in the future with no issues.</u></p>	<p><u>Anne Flynn was registered on the I&AP dataset and was informed accordingly.</u></p>
<p><u>SAHRA requested that an application was created on the South African Heritage Resources Information System (SAHRIS) and all documents are to be uploaded to the case file.</u></p>	<p><u>An application was created on SAHRIS and all documents to date were uploaded to the case file.</u></p>
<p><u>DEA&DP submitted substantial comments. Although all comments are not repeated below, the key comments are summarised below:</u></p> <ol style="list-style-type: none"> <u>1. Relevance of Listing Notice 3 Activity 14 (f) (i) (ff).</u> <u>2. DEA&DP requested clarity on why the substations positions were screened out.</u> <u>3. DEA&DP indicated they do not support route line alternatives linked to the Central Hub SS (i.e. Alternative C).</u> <u>4. All specialist findings and recommendations with respect to the receiving environment must be adhered to and the environmental management programme (EMPr) must be strictly implemented and included in all contract documentation.</u> <u>5. It is noted from the draft BAR that the central hub substation is located in a region of high sensitivity, and the substation infrastructure traversing ecosystems of very high sensitivity. The ecological sensitivity associated with the central hub substation is likely to result in unacceptable</u> 	<p><u>The EAP responded as follows (the number correlates to the number in the comments column):</u></p> <ol style="list-style-type: none"> <u>1. A revised application form was submitted to DEA removing this activity</u> <u>2. Substation positions 1,2,3, 4 and 7 were screened out by taking into consideration financial constraints and technical considerations, such as the length of the cabling required, slope, access roads, information gathered from site visits, etc. Taking these combined factors into consideration, the developer and EAP reduced the amount of lines to be put forward for authorisation under the assumption that these lines were not financially or technically preferred and/or feasible. As such, alternatives were only proposed for environmental assessment if they were both technically and financially feasible.</u> <u>3. The EAP acknowledged this.</u> <u>4. Feasible specialist findings and recommendations have been incorporated into both the Draft and Final EMPr.</u> <u>5. As a mitigation measure, the central hub substation has been moved from the area of high sensitivity to an area of lower ecology sensitivity.</u> <u>6. The ecologist assessed this impact and concluded that “although development within CBA is not desirable, the footprint of the power lines within the CBA would be very low and not significantly impact on biodiversity or ecological functioning of the CBA. Within the study area, all the</u>

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<p><u>environmental costs, and therefore this directorate does not support alternative C.</u></p> <p>6. <u>The development site is located at the junction of three different conservation plans and impact on the ecological connectivity is therefore expected on a broader scale. The competent authority should therefore consider the potential impact on the broad-scale ecological connectivity, which extends beyond the parameters of the footprint of the proposed development.</u></p> <p>7. <u>From the draft BAR it is noted that the development site falls within the western Karoo National Protected Areas Expansion Strategy focus areas, as well as the REDZ. This Directorate does not have clarity whether the overlapping of these broad scale strategic planning goals are compatible and request that this be clarified in the BAR, to be submitted to the competent authority.</u></p> <p>8. <u>DEA&DP raised concerns around erosion, avifauna, visual impacts and cumulative impacts.</u></p>	<p><u>vegetation types present are little transformed, with both Koedoesberge-Moordenaars Karoo and Central Mountain Shale Renosterveld being 99% intact. Within semi-arid areas where the majority of vegetation is natural, there are often many choices as to which areas could fall under CBAs and the final solution may be a design issue rather than a clear-cut biodiversity-priority one. Where CBAs have been designed for connectivity and not to capture high biodiversity areas, they are less vulnerable to habitat loss and in the current case, the low footprint of the powerlines would not disrupt the connectivity of the landscape to any significant degree”.</u></p> <p>7. <u>The proposed WEF is located in an area where the Komsberg Renewable Energy Development Zone overlaps with the Western Karoo NPAES focus area which are both areas identified through broad scale planning. The closest protected area to the proposed site is the Anysberg Nature Reserve. The goal of NPAES is to achieve cost-effective protected area expansion for ecological sustainability and increased resilience to climate change¹². The document does not list conflicting land uses. The strategic planning goals of the REDZ are to earmark areas where large scale wind and solar PV energy facilities can be developed in a manner that limits the potential for significant negative impact on the natural environment, while yielding the highest possible social and economic benefits to the country. These REDZs were identified to support the Strategic Infrastructure Plan (SIP) 8 of the National Infrastructure Plan. Increased Renewable Energy development in South Africa indirectly supports sustainability and increased resilience to climate change as it reduces reliance on coal-fired power generation. On a local scale, the development footprint of 92km² amounts to a fraction of the total Western Karoo NPAES area. Of the 92km² the actual footprint would only be approximately 200ha. The ecologist assessed the impact of the development on the NPAES Focus Area, and determined that the total extent of habitat lost to the current development is not highly significant and would not compromise the overall availability of land to meet conservation goals within the affected NPAES.</u></p> <p>8. <u>The EAP addressed the concerns raised in the Final BAR and EMPr.</u></p>
<p><u>DEA submitted substantial comments. Although all comments are not repeated below, the key comments are summarised below:</u></p> <p>1. <u>Please ensure that all relevant listed activities are applied for, are specific and that it can be linked to the development activity or infrastructure as described in the project description.</u></p> <p>2. <u>DEA requested that all issues raised and comments received during the circulation of the draft BAR from registered I&APs and organs of state are adequately addressed in the Final BAR. Proof of correspondence with the</u></p>	<p><u>The EAP responded as follows (the number correlates to the number in the comments column):</u></p> <ol style="list-style-type: none"> 1. <u>A revised application form (including original signed pages) were enclosed with the submission of the Final BAR to DEA.</u> 2. <u>The request was addressed in Appendix E.</u> 3. <u>The following specialist reports are attached to the FBAR submission:</u> <ul style="list-style-type: none"> • <u>Avifaunal impact assessment;</u> • <u>Archaeological impact assessment (included in the Heritage Impact Assessment);</u> • <u>Traffic impact assessment;</u> • <u>Ecological Impact Assessment;</u> • <u>A social impact assessment conducted for the Wind Farm applications (Brandvalley and Rietkloof Wind Energy Facilities) has been included. The social impact assessment</u>

¹² Government of South Africa, 2010. National Protected Area Expansion Strategy for South Africa 2008. Government of South Africa, Pretoria.

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<p><u>various stakeholders must be included in the Final BAR.</u></p> <p>3. <u>The following specialist studies will be included in the final BAR:</u></p> <ul style="list-style-type: none"> • <u>Avifaunal impact assessment;</u> • <u>Archaeological impact assessment;</u> • <u>Social impact assessment;</u> • <u>Traffic impact assessment and.</u> • <u>Ecological impact assessment.</u> <p>4. <u>DEA commented on cumulative impact assessments.</u></p> <p>5. <u>A copy of the final preferred route layout map must be provided. All available biodiversity information must be used in the finalisation of the layout map. Shapefiles must be provided.</u></p> <p>6. <u>DEA raised comments on the EMPr.</u></p>	<p><u>considered the 33kV power lines, however the report clearly states that offsite power lines were not considered. The majority of the proposed 132kV power line routes are within the project boundary and where it is offsite, it follows the existing Eskom power lines. The SIA already describes the existing power lines in the area and assessed the 33kV power lines to have a low (-) impact. A specialist opinion letter from Mr. Tony Barbour (the social specialist that conducted the SIA for the Wind Farm applications) is attached to the FBAR, confirming the 132kV power lines have similar social impact as the 33kV lines assessed in his report. In the context of the greater development, existing land use and presence of Eskom 400 and 765kV power lines, it is argued that the social impact (visual impacts particularly) will be similar to the proposed 33kV lines for the Wind Farm, rated as low negative.</u></p> <p>4. <u>Specialist provided a cumulative environmental impact statement and significance rating in their reports or in addendum letters to their reports. Please see Appendix D. The cumulative impact significance rating has informed the need and desirability of the proposed development.</u></p> <p>5. <u>The final layout was informed by environmental sensitivities. Final maps are provided in Appendix A and shapefiles are provided on an electronic CD.</u></p> <p>6. <u>The EMPr was updated to respond to the comments from DEA.</u></p>
<p><u>SAHRA commented and requested that a Palaeontological Impact Assessment or a Letter for Exemption for further studies completed by a qualified palaeontologist be completed before further comments can be provided.</u></p>	<p><u>A Letter for Exemption from the Palaeontological specialist can be found in Appendix D.</u></p>
<p><u>Heritage Western Cape requested a Heritage Impact Assessment (HIA) that satisfies the provisions of section 38(3) of the NHRA be submitted</u></p>	<p><u>A Letter for Exemption from the Palaeontological specialist can be found in Appendix D. An HIA has been submitted to Heritage Western Cape. An integrated HIA will be submitted and comment from HWC will be provided to the DEA for decision making.</u></p>
<p><u>CapeNature, as custodian of biodiversity in the Western Cape, issued a single comment concerning the proposed WEFs and dependent 132 kV distribution lines and associated 33/ 132 kV Eskom substations for G7 Rietkloof and Brandvalley developments.</u></p> <p><u>CapeNature provided an overview of the status quo of the vegetation in the area before listing the following fatal flaws:</u></p> <ol style="list-style-type: none"> 1. <u>The combined project area straddles numerous Upstream River Freshwater Ecosystem Priority Areas (FEPA) and associated subquaternary catchment areas. The project area has a high degree of topographical variability, with many kloofs (ravines) and is a high priority un-fragmented landscape being the source area for the Groot River, amongst others. The proposed road network (12 metre width once completed) will severely alter and compromise wetlands and landscape connectivity.</u> 2. <u>Most of the property falls within</u> 	<ol style="list-style-type: none"> 1. <u>The aquatic specialist determined that the proposed layout would seem to have limited impact on the aquatic environment as the proposed structures for the most part have either avoided the delineated watercourses and wetlands with the exception of a number of water course crossings by the proposed access roads. Use of any existing roads will further support this conclusion, particularly with regard the wetland crossings, although the wetlands concerned are already impacted by the surrounding roads, dams and farming activities. It was furthermore indicated that the road width has been reduced from the initially proposed 12meters to the current proposed 9meters. Where any road upgrades are required it is understood that these current crossings may be upgraded by increasing the current size of the culverts and provide additional erosion protection, thus a possible net benefit to the local aquatic systems. Based on the above the EAP does not consider the project as fatally flawed due to impacts on FEPA and wetlands within the project area.</u> 2. <u>This was assessed by the ecologist who stated the following: "Within the study area, the extensive CBA within the Western Cape portion of the site is based on several different criteria. A large proportion of this CBA is related to the fact that is has been identified as a priority area within the National Protected Area Expansion Strategy for South Africa</u>

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<p><u>designated sensitive areas selected for various criteria. It should be noted that industrial WEFs are incompatible with conservation objectives for Critical Biodiversity Areas and related Ecological Support Areas.</u></p> <p>3. <u>The conflict between protection of biodiversity patterns of the National Protected Area Expansion Strategy (NPAES) areas and promotion of industrial development of WEFs (see Figs. 1 and 2) within the Komsberg Renewable Energy Development Zone (REDZ). CapeNature supports the implementation and declaration of further protected areas within the Lower Karoo areas.</u></p> <p>4. <u>The cumulative impacts on, inter alia, the presently un-fragmented, unprotected and pristine Central Mountain Shale Renosterveld (FRs 5); Roggeveld Shale Renosterveld (FRs 3); and Tanqua Escarpment Shrubland (SKv 4) are unprecedented (see Fig. 3); and are not supported.</u></p> <p>5. <u>Based on the available information CapeNature strongly objects to the proposed development of the Brandvalley and Rietkloof WEFs and associated infrastructure.</u></p>	<p><u>(NPAES). This area was identified as a priority area on the grounds that apart from being an extensive tract of unfragmented natural vegetation, it is also an area of high climate and landscape variation which is likely to be resilient to climate change. Overall, the CBA maps for the study area are considered inadequate for use at a fine scale and the data collected on-site is considered to be of greater weight than the CBA status. Therefore, the CBA status of the site is considered secondary to the actual assessed biodiversity status of the different parts of the site. Within the Western Cape, the higher ridges are identified as the most important and the lower lying areas are generally considered significantly less sensitive. Where CBAs have been designed for connectivity and not to capture high biodiversity areas, they are less vulnerable to habitat loss and in the current case, there are significant gaps in the strings of turbines and it is not likely that the development would disrupt the connectivity of the landscape for the majority of species.</u></p> <p>3. <u>In terms of the impact of the development on the NPAES Focus Area, the total extent of habitat lost to the current development is not highly significant and would not compromise the overall availability of land to meet conservation goals within the affected NPAES. However, the density of renewable energy developments in the area is high and the cumulative impact of development may have an impact on future conservation options in the area. It is however also pertinent to consider the extent to which wind energy development is compatible with biodiversity conservation. The actual footprint of the development is low and the majority (98%) of the affected area will remain intact. With mitigation and avoidance, the impact on vegetation and plant species can be reduced to an acceptable level and as such, the development can be considered compatible with the maintenance of plant diversity. The area is a priority area for flora and there are no faunal species within the development area that are a very high conservation priority, the overall impact on biodiversity features of concern would be relatively low. Furthermore, as the total footprint of the development is low, the potential for future rehabilitation of the area after decommissioning of the facility is high and so in the long-term, the potential future conservation value of the area would remain largely intact".¹³ The proposed WEF is located in an area where the Komsberg Renewable Energy Development Zone overlaps with the Western Karoo NPAES focus area which are both areas identified through broad scale planning. The goal of NPAES is to achieve cost-effective protected area expansion for ecological sustainability and increased resilience to climate change. The document does not list conflicting land uses.</u></p> <ul style="list-style-type: none"> • <u>The strategic planning goals of the REDZ are to earmark areas where large scale wind and solar PV energy facilities can be developed to support the Strategic Infrastructure Plan (SIP) 8 of the National Infrastructure Plan. On a local scale, the development footprint amounts to a fraction of the total Western Karoo NPAES area. The ecologist assessed the impact of the development on the NPAES Focus Area, and determined that the total extent of habitat</u>
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¹³ Todd, S. Environmental Impact Assessment for the Proposed Brandvalley or Riektloof Wind Energy Facility: Fauna & Flora Specialist Impact Assessment Report.

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	<p><u>lost to the current development is not highly significant and would not compromise the overall availability of land to meet conservation goals within the affected NPAES. Therefore, it is concluded that on a local scale the REDz and NPAES Focus Areas are compatible.</u></p> <p>4. <u>Please note the findings of the ecology impact assessment and the cumulative impact statement: "Overall, though the predicted footprint from powerlines is low and the cumulative impact of the development is considered to be Low after mitigation."</u></p> <p>5. <u>Please note that CapeNature is a registered I&AP and will receive future correspondence to inform any revised comments.</u></p>
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4. COMMENTS AND RESPONSE REPORT

The practitioner must record all comments received from I&APs and respond to each comment before the Draft BAR is submitted. The comments and responses must be captured in a comments and response report as prescribed in the EIA regulations and be attached to the Final BAR as Appendix E3.

Please see Appendix E3. All comments received during the DBAR review period were captured and responded to before submission of the final BAR to DEA for decision-making. A copy of the CRR will be circulated to all IA&Ps that provided comments.

5. AUTHORITY PARTICIPATION

Authorities and organs of state identified as key stakeholders:

All authorities identified and recorded in the I&AP database were notified of the availability of the DBAR and requested to provide comments.

Include proof that the Authorities and Organs of State received written notification of the proposed activities as appendix E4.

In the case of renewable energy projects, Eskom and the SKA Project Office must be included in the list of Organs of State.

Please see Appendix E for proof of notification to Authorities and for a copy of the I&AP database including Eskom, SALT, SAAO and SKA.

6. CONSULTATION WITH OTHER STAKEHOLDERS

Note that, for any activities (linear or other) where deviation from the public participation requirements may be appropriate, the person conducting the public participation process may deviate from the requirements of that sub-regulation to the extent and in the manner as may be agreed to by the competent authority.

Proof of any such agreement must be provided, where applicable. Application for any deviation from the regulations relating to the public participation process must be submitted prior to the commencement of the public participation process.

A list of registered I&APs must be included as appendix E5. **Please see Appendix E5 for the I&AP database.**

Copies of any correspondence and minutes of any meetings held must be included in Appendix E6.

All correspondence relating to the project have been included in Appendix E6.

SECTION D: IMPACT ASSESSMENT

The assessment of impacts must adhere to the minimum requirements in the EIA Regulations, 2014 and should take applicable official guidelines into account. The issues raised by interested and affected parties should also be addressed in the assessment of impacts.

The 2014 EIA guidelines (notice 891 of 2014) guided this BA process and specifically the impact assessments provided below.

1. IMPACTS THAT MAY RESULT FROM THE PLANNING AND DESIGN, CONSTRUCTION, OPERATIONAL, DECOMMISSIONING AND CLOSURE PHASES AS WELL AS PROPOSED MANAGEMENT OF IDENTIFIED IMPACTS AND PROPOSED MITIGATION MEASURES

Provide a summary and anticipated significance of the potential direct, indirect and cumulative impacts that are likely to occur as a result of the planning and design phase, construction phase, operational phase, decommissioning and closure phase, including impacts relating to the choice of site/activity/technology alternatives as well as the mitigation measures that may eliminate or reduce the potential impacts listed. This impact assessment must be applied to all the identified alternatives to the activities identified in Section A(2) of this report.

The following environmental and social impacts (including cumulative impacts) anticipated during the construction, operation and decommissioning phases of the proposed electrical infrastructure:

- Change in land use from agricultural to power generation. This impact is anticipated to be very low as the only footprint that will no longer be used for agriculture is the 200m x 200m required for the substation. The servitude associated with the powerline can continue to be used for grazing;
- Removal of top soil resulting in soil erosion;
- Impacts to soil land capabilities;
- Impact to fauna and flora;
- Impact to aquatic ecosystems. As part of the EIA process, all surface water features¹⁴ were mapped and will inform this assessment. Please see the coordinate list of all potential watercourse crossings and map included in Appendix A;
- Impacts on avifauna;
- Impacts on archaeological, paleontological and/or cultural sites;
- Social impacts;
- Traffic impacts associated with the construction phase.;
- Noise impacts associated with the construction activities;
- Air quality impacts in the form of additional dust;
- Impact on energy production;
- Visual impacts; and
- Impacts to SALT, SKA and SAO.

DEA&DP and Heritage Western Cape (see Appendix E for copies of these comments) requested that a **Visual Impact Assessment** be undertaken to inform the Basic Assessment process. Although, an overhead 132kV distribution line could typically result in visual impact to the surrounding environment, a visual impact assessment was not undertaken. The proposed overhead 132kV distribution line cross the centre of the WEF project area away before it will run along the existing 400kV and 765kV Eskom power lines within the project area and along the existing 11kV power line from the project area to the Bon Espirange Substation. Therefore, there are likely to be no additional visual impacts to the visual impacts already experienced as a result of the existing Eskom 765kV, 400kV and 11kV lines. In addition, there are limited or no mitigation options to reduce the visibility of an overhead powerline. The proposed layout applied the mitigation measure of following existing infrastructure as

¹⁴ Colloty, B. 2016. Rietkloof Wind Energy Facility. Aquatic Impact Assessment.

far as possible in order to limit the impact on new areas. Therefore, a visual impact assessment was not undertaken¹⁵. Confirmation letters from the social and visual specialists have been included in Appendix D to support this view.

Heritage Western Cape furthermore requested that a **Palaeontology Impact Assessment** be undertaken for the proposed development. Dr. John Almond, a palaeontology specialist responded to this request by confirming that the entire 132kV distribution line project footprint has already been assessed in terms of palaeontological heritage impacts in the course of combined desktop and field-based studies by himself for the two WEFs (including relevant substations) as well as for several neighbouring transmission line, substation and alternative energy projects. All these previous studies have concluded that, while fossil material such as Palaeozoic vertebrate, trace fossil and petrified wood remains do indeed occur in this region of the Karoo, the overall palaeontological sensitivity here is generally low because the well-preserved, scientifically important fossils are very rare. None of the few, small areas of high palaeontological sensitivity that have been identified in previous field assessment reports will be directly impacted by the distribution lines. Bedrock excavations into potentially fossiliferous bedrocks during construction of the 132kV distribution line pylons and associated access roads are likely to be small in volume. The impact significance of the proposed 132kV distribution lines is therefore rated as Low (negative). Given their low impact significance and the fact that the entire development footprint has been previously assessed, no further specialist palaeontological studies are considered necessary in this regard (Almond, 2016)¹⁶. A confirmation letter from the Palaeontological specialist has been included in Appendix D to support this view.

A comment was also received from DEA requiring a social impact assessment and a **Traffic Impact Assessment**. The traffic impact assessment (Aurecon, 2016) assessed the traffic associated with the construction and operation of the 132kV distribution line and substation and therefore informed this assessment. The traffic and transport plan are included in Appendix D.

The **Social Impact Assessment** undertaken to inform the WEF EIA, was considered sufficient to inform this BA process. The SIA (Barbour and van der Merwe, July 2016) found that the potential social impacts associated with the establishment of 33kV overhead power lines and the associated substation will be limited, specifically within the context of the establishment of the wind turbines associated with the proposed WEF. In addition, the power lines are located predominantly on the site. The sections where the distribution line does not follow existing Eskom powerlines are located within the development footprint. The significance of the visual and associated social impacts associated with the establishment of a new 132kV line is therefore likely to be Low Negative. In addition, as indicated in the SIA of the 33kV lines, the impact of a powerline should be viewed within the context of the establishment of the wind turbines associated with the proposed WEF. Also note that this study area has been identified as a Renewable Energy Development Zone by the Strategic Environmental Assessment (SEA) for Wind and Solar PV energy in South Africa undertaken by the CSIR (2015). The area has therefore been identified as an area where renewable energy should be concentrated. Based on this information and the social specialist's experience of the study area, a SIA is not required for the proposed 132 kV distribution line (Barbour, 2016a)¹⁷.

Due to the nature of the project, the majority of impacts were considered to be of low significance and will therefore be assessed by the EAP, informed by the findings of the specialist assessments undertaken for the associated WEF and managed through the EMP.

However, significant impacts to heritage features, social environment, ecology and avifauna could be experienced. In order to assess these impacts specifically associated with the electrical infrastructure, various specialist studies were undertaken as listed in Table 5 below.

¹⁵ Please see addendum letters from Thomas King (visual specialist) and Tony Barbour (social specialist) in Appendix D

¹⁶ Please see addendum letters from John Almond (palaeontological specialist) in Appendix D

¹⁷ Please see addendum letters from Tony Barbour (social specialist) in Appendix D

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Table 5: Construction, operational and decommissioning phase impacts.

No	Specialist assessment			Impact Assessed		
				Construction phase	Operational Phase	Decommissioning phase
1	Archaeological Impact Assessment	Ms Celeste Booth	Booth Consulting Heritage	<ul style="list-style-type: none"> • Destruction of precolonial / stone age material • Destruction of Stone Walling Features • Impact on Graves • Impact to Homesteads / Farmhouse Complexes 		None anticipated
2	Avifaunal Impact Assessment	Dr Tony Williams	African Insights	<ul style="list-style-type: none"> • Disturbance during construction of the sub-stations and powerlines (relevant to all powerline alternatives and all four sub-station locations). • Loss of habitat as a result of grounded features – namely the sub-stations, pylon bases, and associated service tracks during the construction phase. 	<ul style="list-style-type: none"> • Bird mortality through collision with the overhead lines during the operational phase (relevant to all powerline alternatives). 	None anticipated
3	Social Impact Assessment	Mr Tony Barbour	Independent Consultant	<ul style="list-style-type: none"> • Job creation 		
4	Ecological Impact Assessment	Mr Simon Todd	Simon Todd Consulting	<ul style="list-style-type: none"> • Impact on vegetation and listed plant species due to transformation within the development footprint. • Direct faunal impacts due to construction phase noise and physical disturbance. 	<ul style="list-style-type: none"> • Following construction, the site will be highly vulnerable to soil erosion • Following construction, the site will be highly vulnerable to alien plant invasion 	<ul style="list-style-type: none"> • Faunal Impacts due to Decommissioning Phase activities such as noise and disturbance due to the presence of decommissioning staff and the operation of heavy machinery • Soil Erosion Risk • Alien plant invasion will be highly likely within disturbed areas following decommissioning
5	Traffic Impact Assessment	Mr Hermanus Steyn	Aurecon South Africa (Pty) Ltd	<ul style="list-style-type: none"> • Impact of construction traffic 	<ul style="list-style-type: none"> • Very low impact anticipated (will relate only to maintenance vehicles) 	<ul style="list-style-type: none"> • Same as construction.

ASSESSMENT METHODOLOGY (please refer to Appendix K for impact rating tables)

This assessment of impacts considers all components of the proposed project, including the:

- Design phase of the electrical infrastructure (including 132kV onsite substation, service roads and 132kV distribution line);
- Construction phase of the electrical infrastructure (including 132kV onsite substation, service roads and 132kV distribution line);
- Operational phase of the electrical infrastructure (including 132kV onsite substation, service roads and 132kV distribution line); and
- Decommissioning of the electrical infrastructure (including 132kV onsite substation, service roads and 132kV distribution line)

CUMMULATIVE IMPACT ASSESSMENT

Project induced cumulative impacts should be considered, along with direct and indirect impacts, in order to better inform the developer's decision making and project development process. The NEMA 2014 EIA Regulations defines cumulative impacts as *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, than in itself may not be significant, but may become significant when added to the existing and reasonably foreseeable impacts eventuating from similar or diverse activities*". Cumulative impacts result from incremental changes caused by other past, present or reasonably foreseeable actions acting in concert with the project. Individually minor impacts from different developments can interact in various ways over time to become collectively significant. Barbour (2007: 39), adapting work by Cooper, 2004, describes cumulative impacts as impacts which "may be:

- **Additive:** the simple sum of all the effects (e.g. the accumulation of ground water pollution from various developments over time leading to a decrease in the economic potential of the resource);
- **Synergistic:** effects interact to produce a total effect greater than the sum of individual effects. These effects often happen as habitats or resources approach capacity (e.g. the accumulation of water, air and land degradation over time leading to a decrease in the economic potential of an area);
- **Time crowding:** frequent, repetitive impacts on a particular resource at the same time (e.g. multiple boreholes decreasing the value of water resources);
- **Neutralizing:** where effects may counteract each other to reduce the overall effect (e.g. infilling of a wetland for road construction, and creation of new wetlands for water treatment); and,
- **Space crowding:** high spatial density of impacts on an ecosystem (e.g. rapid informal residential settlement)."

Cumulative impacts are, however, difficult to accurately and confidently assess, owing to the high degree of uncertainty, as well as it often being based on assumptions. It is therefore difficult to provide as detailed an assessment of cumulative impacts as is the case for direct and indirect project induced impacts. This is usually because of the absence of specific details and information related to cumulative impacts. In these situations, the EAP ensured that any assumptions made as part of the assessment are made clear. Accordingly, the BA Phase includes an overview and analysis of cumulative impacts related to a variety of project actions, and does not provide a quantitative significance rating for these impacts, as was done for direct project induced impacts. The objective is to identify and focus on potentially significant cumulative impacts so these may be taken into consideration in the decision-making process.

The following assumptions guided the cumulative assessments:

- All projects within a 30km radius were considered along with the existing Eskom 400kV and 765kV powerlines north of Rietkloof.
- All projects will also require the establishment of a 132kV overhead powerline.
- It was assumed that all projects proposed (both energy generation and electrical infrastructure projects) will be implemented as a worst case scenario.

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Other wind and solar renewable energy projects surrounding the project area are shown in Figure 21 below. This was informed by the DEA database of other renewable energy developments (DEA, 2015).

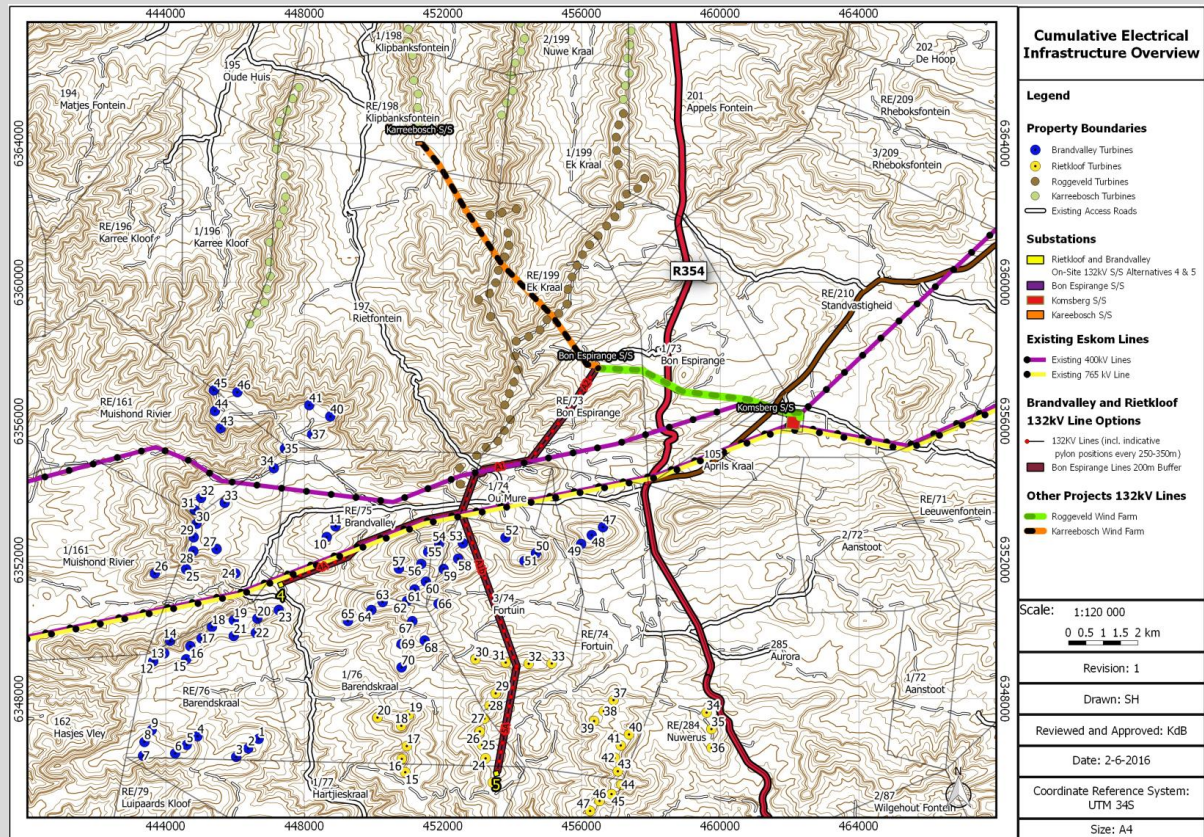


Figure 21: The proposed Rietkloof WEF project site in relation to other neighbouring renewable energy projects and proposed powerlines.

PLEASE NOTE: the following impacts were grouped according to three connection alternatives as the impacts were rated the same. The technology alternative was also grouped with the connection alternatives as the impacts were considered to be the same.

Grouping of alternatives associated with the connection from the onsite substations straight to Bon Espirange Substation (referred to as **Bon Espirange substation connection alternative**), to Komsberg Substation (referred to as **Komsberg substation connection alternative**) or to Bon Espirange or Komsberg Substation via the Central Hub Substation (referred to as **Central Hub substation connection alternative**), was done to provide a more coherent approach to comparing the different alternatives, as opposed to evaluation of the different phases of sub-alternatives. Specific mitigation measures appropriate to each phase is provided in the EMPr attached to this report, and will form a binding document on the developer, contractors and monitoring personnel throughout the project.

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Table 6. Summary impact assessment for impacts assessed by specialists.

#	Impact	Impact summary	Impact description	Significance category BEFORE mitigation	Significance category AFTER mitigation	
1	Archaeological Impact Assessment	Construction	<p>1.1 Destruction of precolonial / stone age material It has been established in this report that precolonial / archaeological heritage remains occur on the flat floodplains and along water courses within the proposed project area. Therefore it is likely that more stone artefacts and possibly other material and organic material may be uncovered during the construction of Substations 2-4 (SS2-SS4) within these areas. The stone artefacts are considered as being irreplaceable heritage resources, once the artefact or the site has been destroyed so has the information for interpretation. This impact was rated as Very High negative prior to mitigation, and Moderate negative thereafter.</p> <p>1.2 Destruction of Stone Walling Features Only two stone packed features occur within 200 m of the proposed powerline alternatives. It is unlikely that these features will be negatively impacted by the proposed project. This impact was rated Very High Negative prior to mitigation, and Moderate negative thereafter.</p> <p>1.3 Impact to Homesteads / Farmhouse Complexes Two homesteads / farm complexes (RKPL_HS1 and RKPL_HS2) were identified 200 m of the proposed powerline alternatives. The homesteads are situated adjacent to the proposed powerline alternatives, however, it is unlikely that they will be negatively impacted by the proposed project. RKPL_HS3 and RKPL_HS4 have merely been shown in the report for their positions and do not occur nearby, within 200m, of the proposed powerline routes. This impact was rated Very High Negative prior to mitigation, and Moderate negative thereafter.</p> <p>1.4 The destruction of Graves (formal and informal burials) (RKPL_G1 – RKPL_G2) Only two of the three areas with graves / burials encountered are within close proximity of any development activities. These family graves are mostly older than 60 years protected and should be respected. Mitigation Measures: A walk-through of the final layout of the preferred power line alternative should be conducted before any final mitigation measures can be established.</p>	VERY HIGH -	MODERATE -	
		Operational	<p>1.5 Impact of the construction of the proposed Substation and Powerlines on the cultural landscape The changing land use in the area may result in a changed cultural landscape associated with the project region. This impact was rate Very High Negative prior to mitigation, and Moderate negative thereafter.</p>	VERY HIGH -	MODERATE -	
		Decommissioning	None anticipated	None anticipated	None anticipated	
		Cumulative	<p>1.5 The construction of the proposed Rietkloof WEF electrical infrastructure and cumulative impacts on heritage resources: The numerous applications and proposed establishment of several wind energy and solar energy facilities between Matjiesfontein and Sutherland as well as the adjacent regions have sparked a concern with regards to cumulative impacts that these projects may have on the heritage resources and the cultural landscape. Therefore it is of the utmost importance to provide a thorough documentation of the archaeological and historical heritage resources, sites and features within the specific project area. The archaeological and historical heritage resources must be appropriately mitigated at a project / site specific level so that there is less of a risk of losing the information after the construction of these alternative energy facilities. The loss of information at regional scale is at risk as these facilities cause an immense amount of surface disturbance and destruction where archaeological and historical heritage resource are at risk of being destroyed without justification. In addition, the cultural landscape of the wider region is inhibited by mass industrialisation of the landscape that changes the character of the landscape and hence impacts on the sense of place and aesthetic value negatively. The Karoo has been considered as a wilderness landscape whereby the cumulative impact will involve significant sterilisation of the aesthetic qualities of the landscape, the Karoo heritage and its character and sense of place. Mitigation Measures: Effective rehabilitation of the landscape after decommissioning. A walk-through of the final layout of the preferred powerline alternative should be conducted before any final mitigation measures can be established.</p>	VERY HIGH -	MODERATE -	
2.	Impact Palaeontology to	Construction	<p>2.1 Impact to fossil heritage resources Bedrock excavations into potentially fossiliferous bedrocks during construction of the 132 kV distribution line pylons and associated access roads are likely to be small in volume.</p>	LOW -	LOW -	
		Cumulative Impacts	<p>2.2 Cumulative Impact to fossil heritage resources Disturbance, damage or destruction of fossil heritage within the development footprint during the construction phase of the WEF combined with other developments in the region affecting the same sedimentary rock units (formations / members)</p>	LOW -	LOW -	

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3	Avifaunal Impact Assessment	Construction	<p>3.1 Disturbance during construction of the sub-stations and power lines (relevant to all power line alternatives and all four sub-station locations).]</p> <p>This is inevitable during the construction of the sub-stations, erection of the 132 kV powerlines, as well as the tracks (service roads) needed to install and service the powerlines. No time period is known at this stage but once development starts the duration of the construction phase is likely to be short, 12-18 months at maximum. Disturbance will cause the local displacement of mainly small scrub-dwelling birds during this phase. The disturbance will be temporary. The impact will be greatest in valley bottom areas where resources (food and breeding sites) and so bird numbers and diversity are higher than elsewhere within the WEF area.</p>	LOW -	LOW -
			<p>3.2 Loss of habitat as result of grounded features – namely the sub-stations, pylon bases, and associated service tracks during the construction phase.</p> <p>The natural vegetation of the area, karooid bush, remains predominant across a wide region. The proposed footprint of the onsite sub-stations, the shared sub-station, and the Bon Espirange sub-station is a square 200 x 200 m including a buffer halo such that habitat destruction will seldom exceed the proposed footprint area. The footprint of each support structure for the 132 kV powerlines is small but there will be greater habitat damage and effective loss along the tracks created for the installation and maintenance of the powerlines.</p> <p>The low woody bushes, the dominant vegetation of this region, are easily damaged by vehicles. They are slow growing and if damaged either do not regenerate or do so over very long periods, as exemplified by infrequently used farm tracks in the area. The footprints of the sub-stations, tracks and powerline support structures will thus result in effectively permanent (>20 years) loss of habitat for local birds. The loss of habitat will be definite and will have a negative, though extremely localized, impact with no probability of mitigation.</p> <p>Elsewhere some bird species are known to be sensitive to human structures especially those that are visually intrusive and make a noise. Species sensitive to these issues may avoid otherwise unchanged habitat for some distance (variable between species) around the human structures. This results in a considerably greater habitat loss for these species than is represented by the actual footprint of the structures. Though, the extent to which bird species in the Rietkloof WEF area are sensitive and may be displaced has not been studied, in the absence of information the precautionary principle must apply and until proved otherwise it must be considered that habitat loss will affect birds, especially larger-bodied birds, over a greater area than the immediate halo around the structures.</p>	MODERATE -	MODERATE -
		Operational	<p>3.3 Bird mortality through collision with the overhead lines during the operational phase (relevant to all powerline alternatives).</p> <p>The habitat, over which the 132 kV powerlines will be developed is one of low karooid scrub. The predominant bushes seldom grow above the knee height of an average human. Most of the food for birds is on this vegetation or the ground below. Consequently, the great majority of birds that use the area have no need to fly high off the ground and their risk of collision with powerlines is inconsequential. The main concern over collision mortality risk is with larger birds, which are known to be less agile in avoiding powerlines and especially those that fly at night when lines are less detectable. Based on four years' experience monitoring birds in immediately adjoining areas three groups of birds are of particular concern in this region. These are: 1) bustards; 2) birds of prey; and 3) waterbirds.</p>	MODERATE -	MODERATE -
	Decommissioning	None anticipated	None anticipated	None anticipated	

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		Cumulative	<p>3.4 The following cumulative impacts were assessed:</p> <ul style="list-style-type: none"> • Electrocutation • Habitat Destruction • Displacement • Solar Array Collision • Wind Turbine Collision • Powerline Collision <p>All the other developments (see cumulative map included in Appendix A) are in areas of predominantly low scrub vegetation which covers a far wider area within South Africa. This vegetation, compared with wetter areas and richer vegetation types, offers few resources to birds so species diversity and, especially, the density and size of bird populations are low. The only local exceptions are small patches of natural riparian bush and farmlands with dams, trees and cultivated (often irrigated) fields.</p> <p>Development of the windfarms requires widening of old farm roads and the construction of new roads to enable large vehicles to access to the hilltops where turbines, with their associated footprint areas will be located. These developments will result in considerable disturbance through the construction phase and the loss of considerable habitat. The solar power plants will also destroy habitat.</p> <p>The potential impacts, on birds, of the three alternative powerline routes have to be considered against this cumulative background.</p> <p>To transfer electricity from the turbine strings to the national grid will, if all the proposed wind farms get authorisation, require a considerable number of 33kV overhead powerlines between turbine strings to one or more sub-stations and, after transformation, 132 kV lines from the sub-station(s) to the main Eskom 400 KV line. In places the 33 kV and some 132KV lines will cross valleys at right angles and also obstruct low points in ridges which are preferred flight paths of birds.</p> <p>Many birds in the region birds prefer to fly along valleys rather than cross ridges. These lines will increase collision risk. This is especially the case for those larger birds which move by night e.g. waterbirds moving between dams in the valleys. Together the cumulative impact of these power lines, because they are less readily seen and are more often located across bird flight routes, impose a greater threat to birds than the turbines which are all located on hilltops which, in this region, support few birds. The cumulative impacts are acceptable provided the mitigation measures are implemented.</p>	LOW -	LOW -
4	Social Assessment	Impact	<p>4.1 Social and visual impact of power line</p> <p>The Rietkloof WEF proposed infrastructure includes 33kV overhead power lines linking groups of wind turbines to onsite 33/132kV substation(s). A number of potential electrical 33kV power lines will be required in order to connect wind turbines to the preferred on-site substation. The facility will consist of both above and below ground 33kV electrical infrastructure depending on what will require the shortest distance and result in the least amount of impacts to the environment. The total footprint of the substation will be ~ 200mx200m. Four on-site substation alternatives have been identified, namely, Substation Alternative 1, 2, 3 or 4.</p> <p>The potential social impacts associated with the establishment of 33kV overhead power lines and the associated substation (see below) will be limited, specifically within the context of the establishment of the wind turbines associated with the proposed WEF. In addition, the power lines are located on the site. The proposed 132kV power lines for the proposed Rietkloof will follow the existing 765kV Eskom power line for 5km before heading north for 1.2km and then follow the existing 400kV power line before linking up with the Bon Espirange substation. The short sections where the power line does not follow existing Eskom power lines are located within the development footprint. The significance of the visual and associated social impacts associated with the establishment of a new 132 kV line is therefore likely to be Low Negative.</p> <p>In addition, as indicated in the assessment of the 33kV lines, the impact of a power line should be viewed within the context of the establishment of the wind turbines associated with the proposed WEF. Added to this study area has been identified as a Renewable Energy Development Zone by the Strategic Environmental Assessment (SEA) for Wind and Solar PV energy in South Africa undertaken by the CSIR (2015). The area has therefore been identified as an area where renewable energy should be concentrated</p>	LOW -	LOW -
		Construction	None anticipated	None anticipated	None anticipated
		Operation	None anticipated	None anticipated	None anticipated
		Decommissioning	None anticipated	None anticipated	None anticipated

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		Cumulative	<p>4.2 Cumulative impact Based on the findings of the SIA the potential social impacts associated with the internal overhead power lines and substation will be Low Negative, specifically within the context of the establishment of the wind turbines associated with the proposed WEF. As such there is no clearly preferred alternative for the power lines. However, the final route selection of the power lines should be informed by current location of farm dwellings on the site and the findings of the VIA, botanical and soil study. The findings of the VIA (EOH, Coastal and Environmental Services, 2016), indicate that Substation Alternative 1 has the lowest view-shed and is therefore the preferred alternative. This finding is supported by the SIA.</p>	LOW -	LOW -
5	Ecological Impact Assessment	Construction	<p>5.1 Impact on vegetation and listed plant species due to transformation within the development footprint. There are listed and protected species confirmed present at the site and it is some of these species would be impacted during site clearing. Although a preconstruction walk-through can reduce this impact, there is still likely to be some unavoidable impact on vegetation and listed plant species. Overall, after mitigation, which includes relocating powerlines out of the Very High sensitivity areas, the impact is likely to be of Low significance.</p>	MODERATE -	LOW -
			<p>5.2 Direct faunal impacts due to construction phase noise and physical disturbance. The construction phase will involve some disturbance at the site due to the operation of heavy machinery, human presence and noise from blasting and machinery. This will deter larger fauna from the area and smaller fauna may suffer direct habitat loss or be killed if they are unable or too slow to move away from construction activities. As the construction activities cannot be avoided, it is not possible to mitigate some of these impacts. They are however transient and disturbance levels will subside significantly in the operational phase. Construction phase faunal disturbance is considered to have a Low significance after mitigation.</p>	MODERATE -	
		Operational	<p>5.3 Following construction, the site will be highly vulnerable to soil erosion Areas disturbed during construction will remain vulnerable to disturbance for some time into the operational phase and will require regular maintenance to ensure that erosion is minimised. With mitigation, this impact can however be reduced to a Low level.</p>	MODERATE -	LOW -
			<p>5.4 Following construction, the site will be highly vulnerable to alien plant invasion Disturbed areas are vulnerable to alien plant invasion and it is likely that disturbed areas such as roads and pylon footprints will be foci for alien plant invasion. Uncontrolled invasion can result in invasion into the intact rangeland and where woody species are involved, this can result in loss of biodiversity and a decline in ecosystem services. With regular clearing and management, this impact can be reduced to a Low significance level.</p>	MODERATE -	
		Decommissioning	<p>5.5 Faunal Impacts due to Decommissioning Phase activities such as noise and disturbance due to the presence of construction staff and the operation of heavy machinery Decommissioning will require the use of heavy machinery on-site and will generate a lot of noise and disturbance which would have a negative impact on fauna. This impact would however be relatively short-lived and would ultimately result in the removal of the development and rehabilitation of the site and as such the ultimate impact of decommissioning on fauna would be Low after mitigation.</p>	MODERATE -	LOW -
			<p>5.6 Soil Erosion Risk Decommissioning will result in a lot of disturbance which will leave the site vulnerable to erosion. As a result the site should be monitored for erosion problems for at least 2 years after decommissioning or until vegetation cover has recovered to within 60% of natural levels. With mitigation, this impact can be reduced to a Low significance.</p>	MODERATE -	
			<p>5.7 Alien plant invasion will be highly likely within disturbed areas following decommissioning Decommissioning will leave the site vulnerable to alien plant invasion and alien plants should be monitored and managed for at least two years following decommissioning or until an adequate cover of perennial plants has been established in disturbed areas. With mitigation, this impact can be reduced to a Low significance.</p>	MODERATE -	
		Cumulative	<p>5.8 Impacts on Critical Biodiversity Areas and broad-scale ecological processes Cumulative impacts are a concern at the site due to the large amount of wind energy development in the area. Furthermore the powerline development is within CBAs and could result in increased habitat fragmentation and reduced landscape connectivity. Overall, though the predicted footprint from powerlines is low and the cumulative impact of the development is considered to be Low after mitigation.</p>	MODERATE -	LOW -
6	Traffic Impact Assessment	Construction	<p>6.1 The transport of electrical components, including mast, cables, connectors and transformers will contribute to the overall traffic in the area.</p>	LOW -	LOW -
		Operational		None anticipated	None anticipated
		Cumulative	<p>6.2 Although unlikely, should the construction phase of the project coincide with many of the other regional WEF and 132kV line projects, an elevated traffic impact will occur.</p>	MODERATE -	LOW -

Table 7: Summary impact assessment for impacts assessed by EAP.

Impact	Impact summary	Significance category – BEFORE mitigation	Significance category – AFTER mitigation
1. Visual impact	Direct impacts: One additional 132kV powerline will affect the sense of place. However, considering that the powerline will be in close proximity to the existing Eskom powerlines, it is anticipated to be a very low impact.	LOW -	LOW -
	Indirect impacts: None	None anticipated	None anticipated
	Cumulative impacts: Combined visual impact from WEF and power line type projects within the region.	HIGH -	MODERATE -
2. Surface water impacts	Direct impacts: Micro-siting of pylons may induce impact on river or wetland features	MODERATE -	LOW -
	Indirect impacts: None	None anticipated	None anticipated
	Cumulative impacts: Cumulative impact	MODERATE -	LOW -
3. Erosion impact	Direct impacts: Areas disturbed during construction will remain vulnerable to disturbance for some time into the operational phase and will require regular maintenance to ensure that erosion is minimised.	MODERATE -	LOW -
	Direct impacts: Decommissioning will result in disturbance which will leave the site vulnerable to erosion. As a result the site should be monitored for erosion problems for at least 2 years after decommissioning or until vegetation cover has recovered to within 60% of natural levels.	MODERATE -	LOW -
	Indirect impacts: None	None anticipated	None anticipated
	Cumulative impacts: Cumulative soil erosion from adjacent project works	MODERATE -	LOW -
4. Impact to soil land capabilities	Direct impacts: Loss of agricultural land. The proposed layout avoids all cultivated land. Once construction is completed, the servitude can continue to be used as grazing.	LOW -	LOW -
	Indirect impacts: Erosion- see impact above		
	Cumulative impacts: Cumulative soil erosion from adjacent project works	LOW -	LOW -
5. Impact on energy production;	Direct impacts: This project does not produce energy; however, without these power lines the energy developed by the WEF will remain unused as it cannot be beneficiated in a meaningful way. Thus this project contributed indirectly to energy production nationally	MODERATE +	MODERATE +
	Indirect impacts: None	None anticipated	None anticipated
	Cumulative impacts: None	None anticipated	None anticipated
6. Noise impacts associated with the construction phase	Direct impacts: Construction phase activities will incur elevated noise levels through machinery, staff on site and vehicles	LOW -	LOW -
	Indirect impacts: None	None anticipated	None anticipated
	Cumulative impacts: None	None anticipated	None anticipated
7. Dust impacts associated with the construction phase impacting on SALT, SKA or SAAO	Direct impacts: Construction phase activities will liberate greater quantities of dust than the current land use, albeit temporarily	LOW -	LOW -
	Indirect impacts: None	None anticipated	None anticipated
	Cumulative impacts: While unlikely, should the construction phase for the wider regions' construction projects coincide, short term elevated dust creation may occur	LOW -	LOW -

2. ENVIRONMENTAL IMPACT STATEMENT

Taking the assessment of potential impacts into account, please provide an environmental impact statement that summarises the impact that the proposed activity and its alternatives may have on the environment after the management and mitigation of impacts have been taken into account, with specific reference to types of impact, duration of impacts, likelihood of potential impacts actually occurring and the significance of impacts.

Without implementing mitigation measures, the key concerns would be cumulative impacts on avifauna, heritage and visual impacts. As indicated in the Impacts Table 6 and 7, most impacts can be reduced to an acceptable low (-) or moderate (-) significance with the implementation of mitigation measures. There are positive social impacts associated with the proposed development.

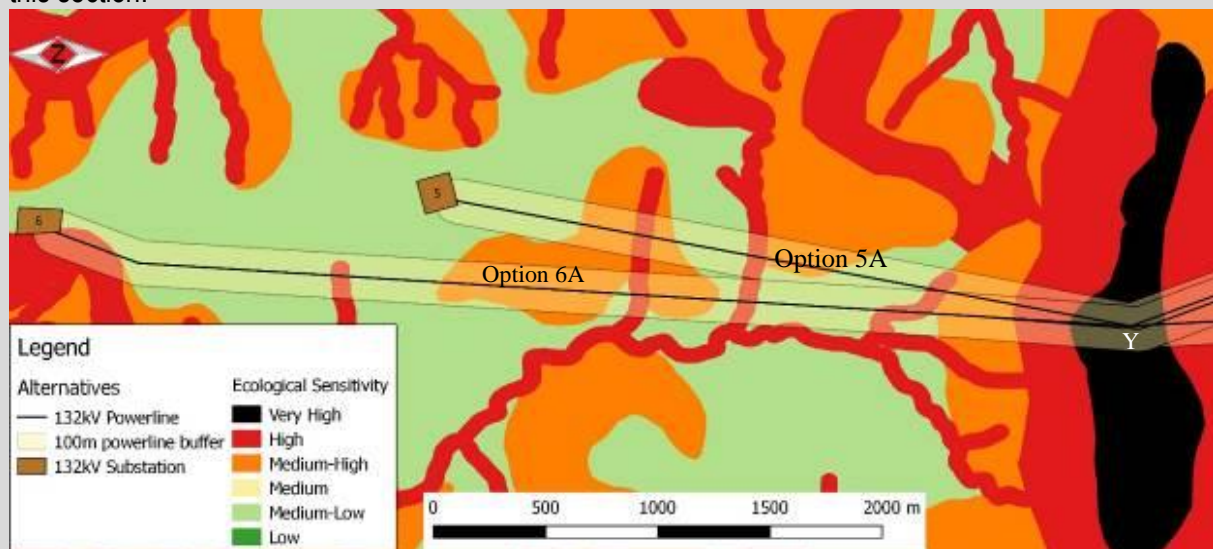
Based on the summary above, all impacts can be mitigated to an acceptable level except for visual and heritage impacts. Heritage features will be buffered and avoided and will therefore not be impacted. It is requested that the visual impact be viewed in the light that the Rietkloof Wind Farm is located within an area earmarked for Renewable Energy Development in terms of the REDZ which motivates for wind and solar developments to be concentrated in specific areas to limit the areas affected by the visual impact typically associated with these developments. Additionally, the proposed overhead 132kV distribution line will run along the existing 400kV and 765kV Eskom power line within the project area and along the 11kV power line from the project area to the Bon Espirange. Therefore, there are likely to be no additional visual impacts as a result of the 132kV distribution line.

ALTERNATIVES

This section discusses assessment of the screened out layout alternatives based on the environmental significance methodology described in Appendix L. These layout alternatives were screened out from the initial layout alternatives described in section A2 based on environmental, economic and technical considerations. Therefore, only the screened out layout alternatives will be given further attention in the impact section below.

Alternative A

Ecological sensitivities for Option 5A and Option 6A. There are no known heritage and bird sensitivities in this section.



Alternative A: Section 1 Option 5A

Impact Statement	Impact rating	Mitigation rating	Option rating	Comments
1. Birds sensitivity	Low	Achievable	Option preferred	This line is located outside of high bird sensitive areas

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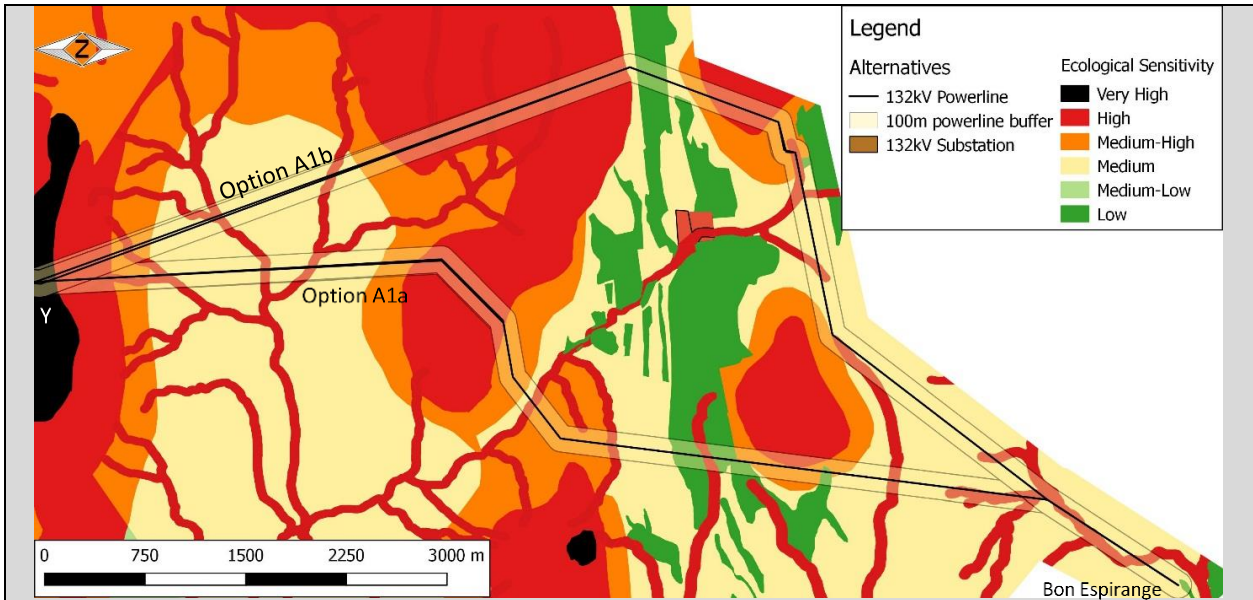
2. Heritage	Low	Easily Achievable	Option preferred	This line is located outside of heritage sensitive areas
3. Ecological	Very High	Difficult	Option not viable	The line crosses three (3) water courses, has ± 270 in Very High sensitivity , ± 260 m in High sensitivity, ± 970 m of Medium-High sensitivity, ± 1300 m of Medium-Low sensitivity
Alternative A: Section 1 Option 6A				
Impact Statement	Impact rating	Mitigation rating	Option rating	Comments
1. Birds sensitivity	Low	Achievable	Option preferred	This line is located outside of high bird sensitive areas
2. Heritage	Low	Easily Achievable	Option preferred	This line is located outside of heritage sensitive areas
3. Ecological	Very High	Difficult	Option not viable	The line crosses four water courses, has ± 290 in Very High sensitivity , ± 550 m in High sensitivity, ± 1400 m of Medium-High sensitivity, ± 2100 m of Medium-Low sensitivity
Conclusion	Both Option 5A and Option 6A are considered not viable from an ecological perspective. Even if pylons are placed on either side of the very-high sensitive area they would still be placed in high sensitive areas. Option 5A and Option 6A could be viable options if they were rerouted around the Very-high sensitivity. However, rerouting might not be the technically best solution, given the length and additional number of pylons. Therefore, the best approach would be to walkthrough the positions where pylons are to be constructed as well as limit road access to either side of the very high sensitive area and not cross it.			

Alternative A: Section 2

Bird, Heritage and Ecological sensitivities for Option 5A and Option 6A.



BASIC ASSESSMENT REPORT



Alternative A: Section 2 Option A1a

Impact Statement	Impact rating	Mitigation rating	Option rating	Comments
1. Birds sensitivity	Very High	Difficult	Option not viable	This line crosses the central section of the high sensitivity bird corridor and spans the length of the corridor for $\pm 150\text{m}$ of the powerline
2. Heritage	Low	Easily Achievable	Option preferred	This line is located outside of heritage sensitive areas
3. Ecological	Very High	Difficult	Option not viable	The line crosses twelve (12), has $\pm 150\text{m}$ in Very High sensitivity , $\pm 1400\text{m}$ in High sensitivity, $\pm 2050\text{m}$ of Medium-High sensitivity, $\pm 3600\text{m}$ (3.6km) of Medium sensitivity

Alternative A: Section 2 Option A1b

Impact Statement	Impact rating	Mitigation rating	Option rating	Comments
1. Birds sensitivity	Low	Achievable	Option preferred	This line is located outside of high bird sensitive areas
2. Heritage	Low	Easily Achievable	Option preferred	This line is located outside of heritage sensitive areas
3. Ecological	Very High	Difficult	Option not viable	The line crosses twelve (12) water courses, $\pm 150\text{m}$ in Very High sensitivity , $\pm 2800\text{m}$ (2.8km) in High sensitivity, $\pm 850\text{m}$ of Medium-High sensitivity, $\pm 1450\text{m}$ of Medium sensitivity

Conclusion

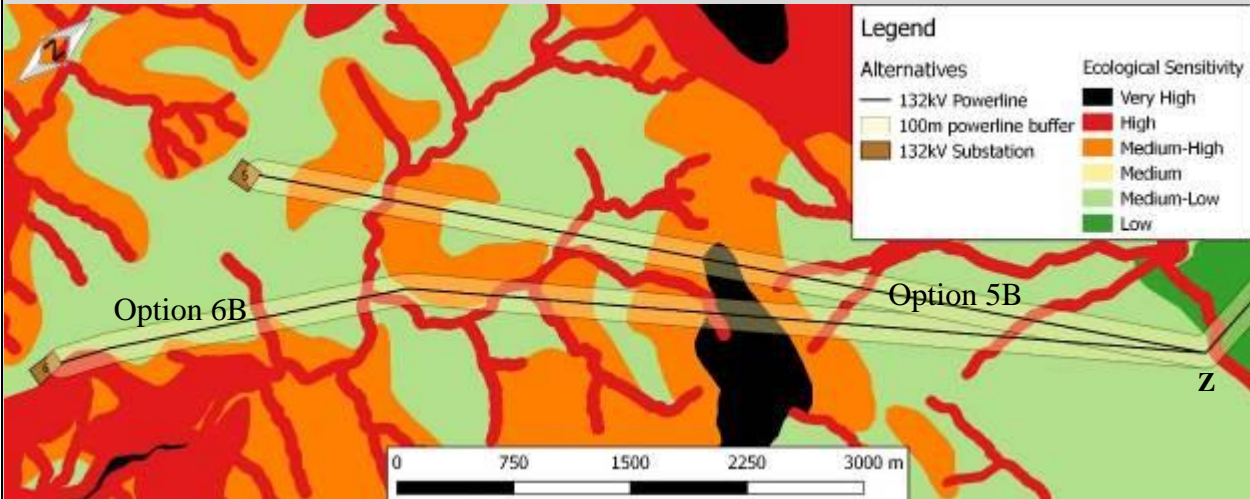
Both Option A1a and Option A1b are considered not viable. Even if pylons are placed on either side of the very-high ecological sensitive area they would still be placed in high ecological sensitive areas. Option A1b could be a viable option if it is rerouted around the Very-high sensitivity, Option A1a is however still considered not viable given the power line crosses the entire high sensitivity bird corridor. Therefore Option A1b is the better of the two options if one of them has to be built.

BASIC ASSESSMENT REPORT

Alternative B

Alternative B: Section 1

Ecological sensitivities for Option 5B and Option 6B. There are no known heritage and bird sensitivities in this section.



Alternative B: Section 1 Option 5B

Impact Statement	Impact rating	Mitigation rating	Option rating	Comments
1. Birds sensitivity	Low	Achievable	Option preferred	This line is located outside of high bird sensitive areas
2. Heritage	Low	Easily Achievable	Option preferred	This line is located outside of heritage sensitive areas
3. Ecological	Very High	Difficult	Option not viable	The line crosses five(5) water courses, has $\pm 230m$ in Very High sensitivity , $\pm 1700m$ of Medium-High the remainder in medium-low ecological sensitivity

Alternative B: Section 1 Option 6B

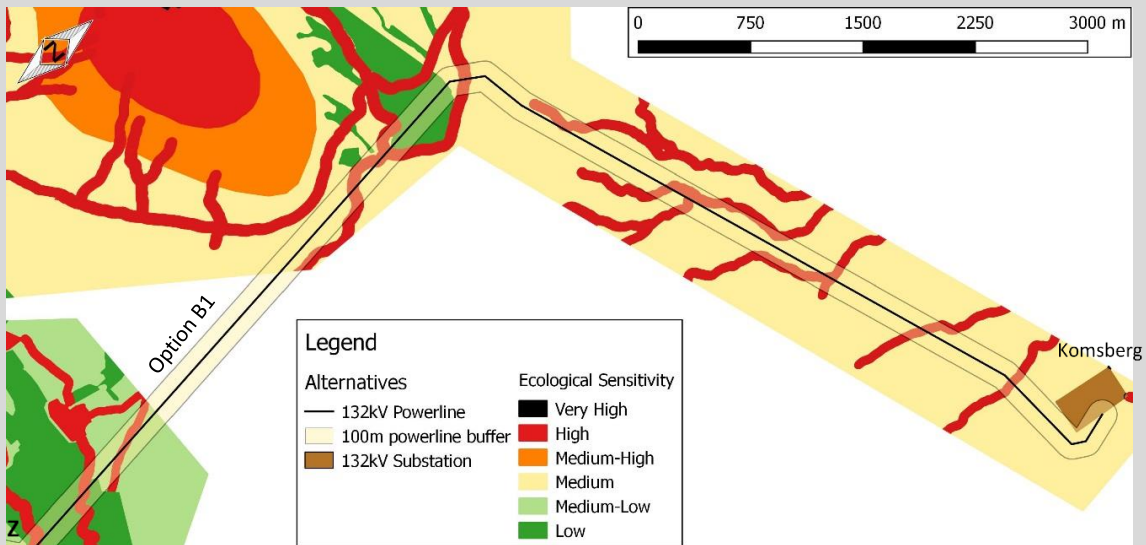
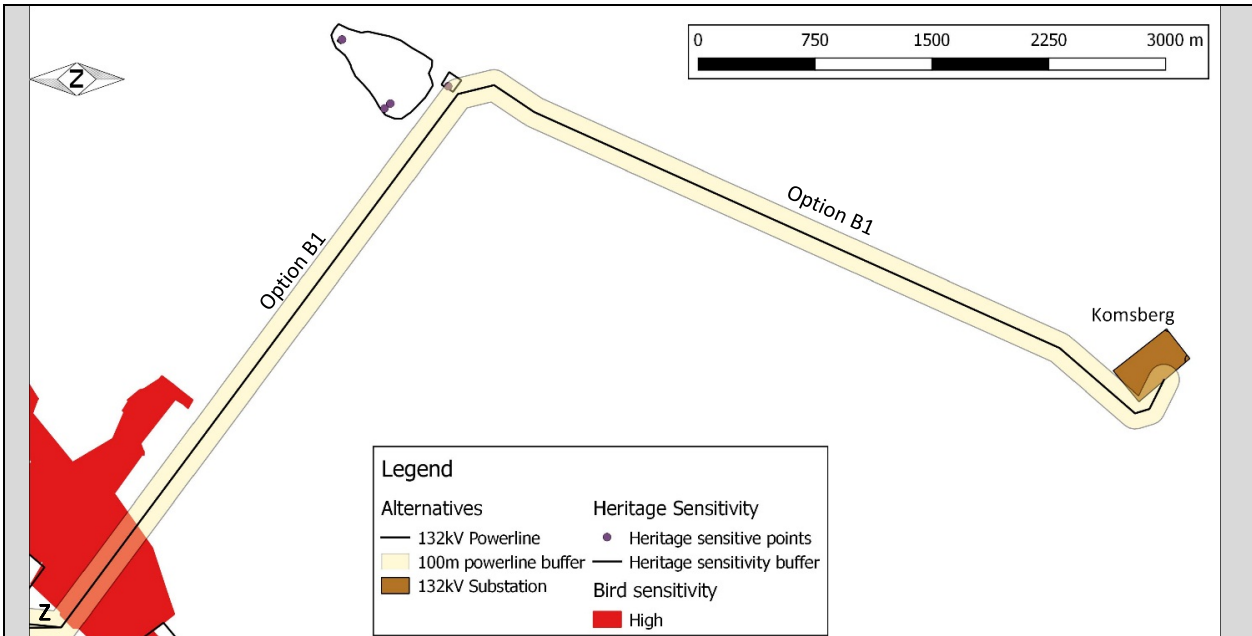
Impact Statement	Impact rating	Mitigation rating	Option rating	Comments
1. Birds sensitivity	Low	Achievable	Option preferred	This line is located outside of high bird sensitive areas
2. Heritage	Low	Easily Achievable	Option preferred	This line is located outside of heritage sensitive areas
3. Ecological	Very High	Difficult	Option not viable	The line crosses seven water courses, has $\pm 230m$ in Very High sensitivity , $\pm 1600m$ of Medium-High the remainder in medium-low ecological sensitivity

Conclusion	Both Option 5B and Option 6B are considered not viable given that the cross an area of very high ecological sensitivity. Option 5B is preferred over option 6B, provided all Option 5B powerline infrastructure avoids the very high ecological sensitive area and places pylons on either side of the area. Line option 5B and 6B have no lines or pylons placed in known high bird and heritage sensitive areas.
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Alternative B: Section 2

Ecological, Bird and Heritage sensitivities for Option B1.

BASIC ASSESSMENT REPORT



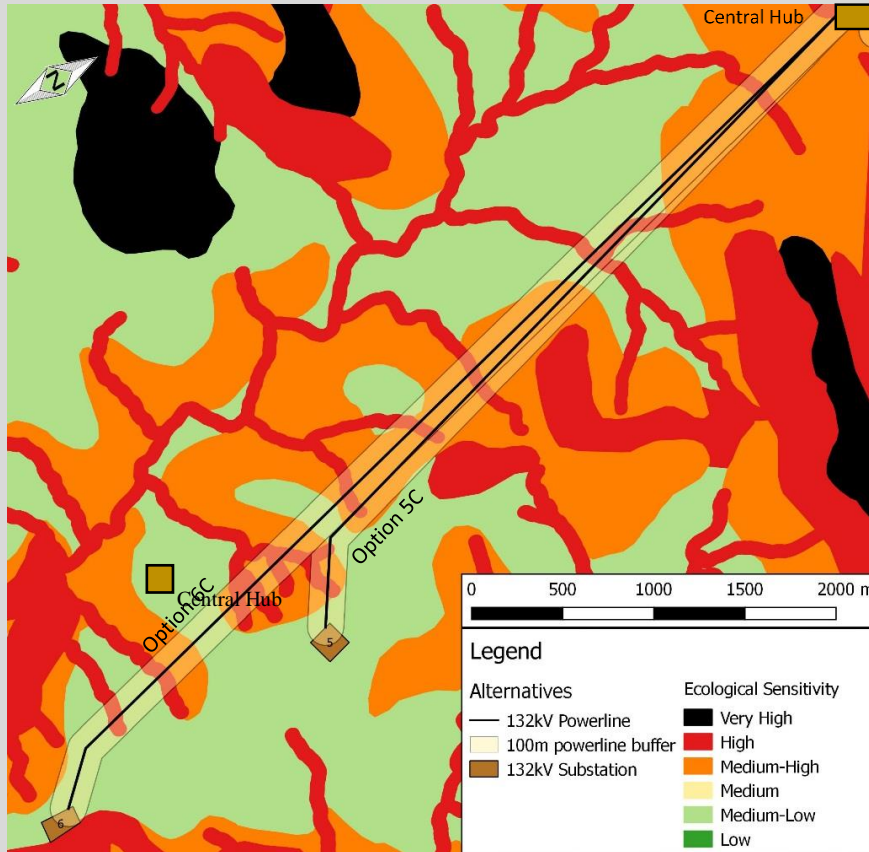
Alternative B: Section 2. Option B1 (Point Z to Komsberg)

Impact Statement	Impact rating	Mitigation rating	Option rating	Comments
1. Birds High sensitivity	Very High	Difficult	Option not viable	This line crosses the south-eastern portion of the high sensitivity bird corridor and spans the length of the corridor for ±780m.
2. Heritage	Low	Achievable	Option preferred	Does not affect the heritage sensitivity points or associated buffers
3. Ecological	Moderate	Achievable	Option preferred	Crosses 11 Water courses and mainly crosses areas of Medium to Low ecological sensitivity
Conclusion	Route option B1 (Point Z to Komsberg) is considered not viable. Route option B1 could be possibly viable provided Route option B1 does not cross the highly sensitive bird corridor.			

Alternative C

Alternative C: Section 1

Section 1 has two route options: Option 5C (Substation 5 to Central Hub) and Option 6C (Substation 6 to Central Hub). The Ecological sensitivities for Section 1 route options is presented below. There are no known heritage and bird sensitivities in this section.



Alternative C: Section 1 Option 5C

Impact Statement	Impact rating	Mitigation rating	Option rating	Comments
1. Birds sensitivity	Low	Achievable	Option preferred	This line is located outside of high bird sensitive areas
2. Heritage	Low	Achievable	Option preferred	Does not affect the heritage sensitivity points or associated buffers
3. Ecological	Moderate	Achievable	Option preferred	The line crosses eight (8) water courses and the majority of the line crosses medium-high and medium low ecological sensitivity.

Alternative C: Section 1 Option 6C

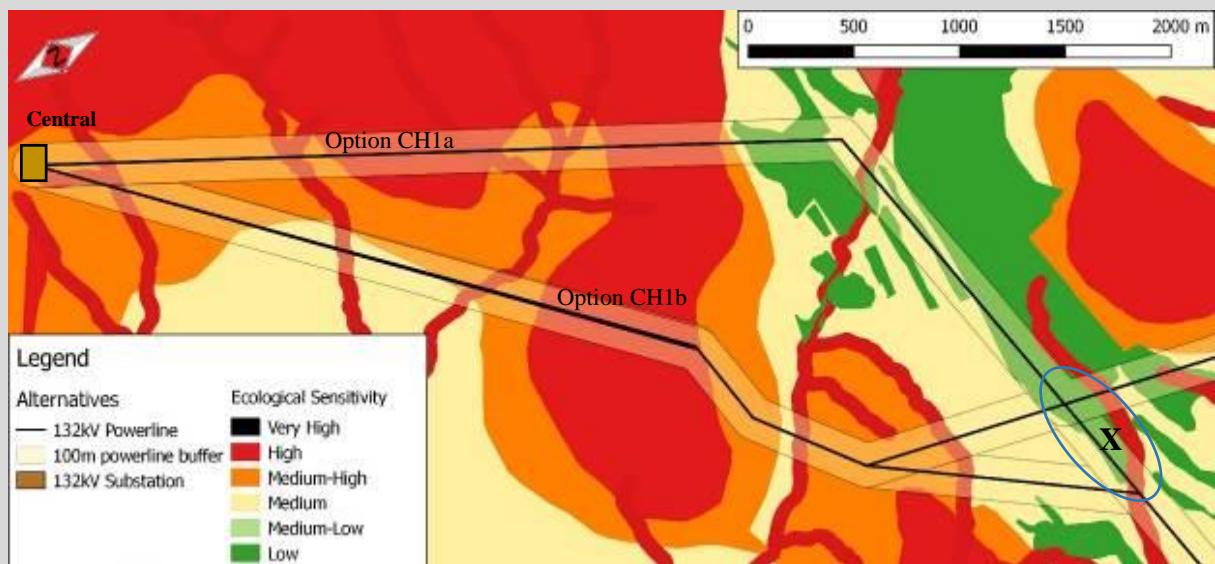
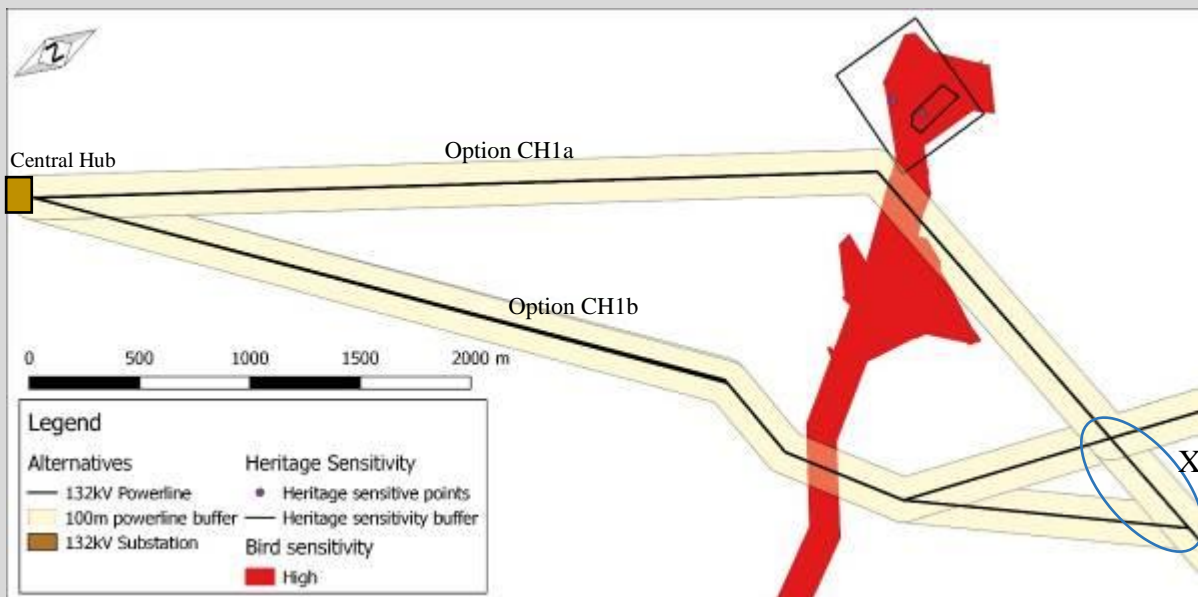
Impact Statement	Impact rating	Mitigation rating	Option rating	Comments
1. Birds sensitivity	Low	Achievable	Option preferred	This line and its pylons are located outside of high bird sensitive areas
2. Heritage	Low	Achievable	Option preferred	Does not affect the heritage sensitivity points or associated buffers

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3. Ecological	Moderate	Achievable	Option preferred	The line crosses twelve (12) water courses and the majority of the line crosses medium-high and medium low ecological sensitivity.
Conclusion		Both line option 5C and 6C are preferred options. Option 5C is preferred over option 6C. Option 5C has fewer water crosses and is shorter thus is the preferred option from an ecological perspective. Both options are preferred from a Bird and Heritage perspective.		

Alternative C: Section 2

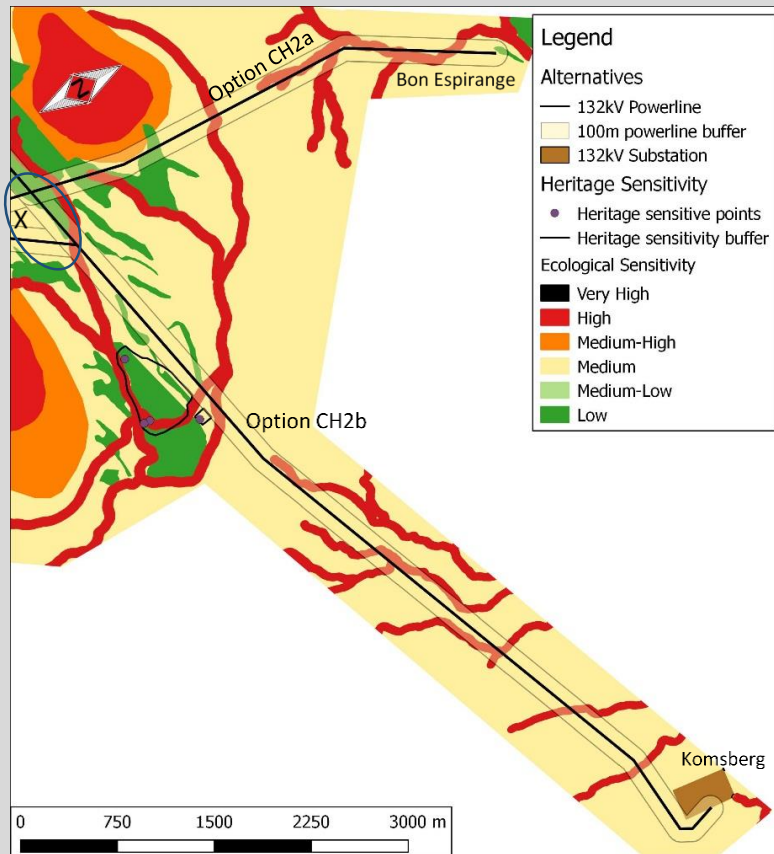
Section 2 has two route options: Option CH1a (Central Hub to Point X) and Option CH1b (Central Hub to Point X). Option CH1b has two paths to reach point X, these have been treated as one option given their proximity to each other and the minimal distance between them. Bird, Heritage and Ecological sensitivities maps for section 2 is presented below.



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Alternative C: Section 2 Option CH1a				
Impact Statement	Impact rating	Mitigation rating	Option rating	Comments
1. Birds sensitivity	Very High	Difficult	Option not viable	This line crosses the northern section of high sensitivity bird corridor and spans the length of the corridor for ±250m.
2. Heritage	Low	Easily Achievable	Option preferred	This line and pylons are located outside of heritage sensitive areas
3. Ecological	High	Difficult	Option possibly viable	The line crosses five (5) water courses. The line crosses ±1.4km of high ecological sensitivity, ±1.6km of Medium-High sensitivity and the remainder crosses low ecological sensitivity.
Alternative C: Section 2 Option CH1b				
Impact Statement	Impact rating	Mitigation rating	Option rating	Comments
1. Birds sensitivity	Very High	Difficult	Option not viable	This line crosses the central section of the high sensitivity bird corridor and spans the length of the corridor for ±150m of option CH1 powerline
2. Heritage	Low	Easily Achievable	Option preferred	This line is located outside of heritage sensitive areas
3. Ecological	High	Difficult	Option possibly viable	The line crosses six (6) water courses, line crosses ±0.8km of high ecological sensitivity and ±2.2km in Medium-High ecological sensitivity.
Conclusion	<p>Both option CH1a and CH1b are considered not viable. Both line option CH1a and CH1b cross the entire high sensitivity bird corridor. CH1a crosses a greater length (250m) then CH1b (150m). The bird sensitivity is considered higher in the center of the bird corridor and thus option CH1a is preferred over CH1b from a bird sensitivity perspective.</p> <p>Both options are preferred from Heritage sensitivity.</p> <p>Both line option CH1a and CH1b have similar ecological impacts, the pylons for both lines would be located in high ecological sensitivity and they cross a similar number of water courses.</p> <p>Neither are considered the preferred option, however both options are possibly viable from an ecological and heritage sensitivity perspective.</p>			
<p>Alternative C: Section 3</p> <p>Section 3 has 2 route options: Option CH2a or Option CH2b. Option CH2a starts at Point X and ends at Bon Espirange Substation. Option CH2b starts at Point X and ends at the Komsberg Substation. Ecological sensitivities for Section 3 is presented below. There are no known heritage and bird sensitivities in this section.</p>				

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Alternative C: Section 3 Option CH2a

Impact Statement	Impact rating	Mitigation rating	Option rating	Comments
1. Birds sensitivity	Low	Achievable	Option preferred	This line is located outside of high bird sensitive areas
2. Heritage	Low	Achievable	Option preferred	The line and its pylons is located outside of the heritage sensitive buffer and points
3. Ecological	Moderate	Achievable	Option preferred	The line crosses the water courses seven (7) times and the northern section runs along the watercourse, the line crosses $\pm 1.9\text{km}$ of Medium sensitivity and $\pm 0.5\text{km}$ low ecological sensitivity.

Alternative C: Section 3 Option CH2b

Impact Statement	Impact rating	Mitigation rating	Option rating	Comments
1. Birds sensitivity	Low	Achievable	Option preferred	The line and its pylons is located outside of high bird sensitive areas
2. Heritage	Low	Achievable	Option preferred	The line and its pylons is located outside of the heritage sensitive buffer and points
3. Ecological	Moderate	Achievable	Option preferred	The line crosses eight (8) water courses, the eastern half of the line crosses $\pm 5.5\text{km}$ of Medium ecological sensitivity and $\pm 0.5\text{km}$ low ecological sensitivity.

Conclusion	Both line option CH2a and CH2b have similar ecological impacts, the majority of pylons for both lines would be located in medium ecological sensitive areas, however CH2a is $\pm 4\text{km}$ in length and CH2b is $\pm 7.5\text{km}$ in length.			
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Option CH2a is preferred over CH2b from an ecological perspective, since CH2a crosses fewer number of water courses and is 3km shorter as will have an overall lower impact.

Route analysis of Alternatives and section options

4. Route analysis of Alternative section options

Although Alternative A, Alternative B and Alternative C have been split into options to aid discussion, it needs to be borne in mind that as the route must be continuous, the options within a section are not interchangeable and one cannot mix and match the different options between the two sections. Thus we need to look at viable options for each Alternative.

Route options:

Alternative A

- Option 5A and A1b*
- Option 5A and A1a*
- Option 6A and A1a*
- Option 6A and A1b*

Alternative B

- Option 5B and B1*
- Option 6B and B1*

Alternative C

- Option 5C and CH1a/CH1b and CH2a*
- Option 5C and CH1a/CH1b and CH2b*
- Option 6C and CH1a/CH1b and CH2a*
- Option 6C and CH1a/CH1b and CH2b.*

Each alternative (Alternative A, B and C) has different sub-alternatives (route options within each alternative) for distribution line connection. The table below summarises the impact of each sub-alternative assessed in detail in the impact statement above.

Each alternative was subject to a bird, ecology and heritage impact assessment and each sub-alternative was rated as either preferred, possibly viable or not viable based on these assessments.

A score of:

- One (1) indicates that the option has been chosen by one (1) of the specialist impact assessments.
- Two (2) indicates that the option has been chosen by two (2) of the specialist impact assessments and
- Three (3) indicates that the option has been chosen by three (3) of the specialist impact assessments

Thus a sub-alternative could score a minimum option rating of 0 and a maximum of 3.

The most preferred Alternative will be the alternative with the greatest number of sub-alternatives (Section/option) in the 'Option Preferred' category (yellow row). As illustrated below Alternative A starting at Substation 5 and ending at Bon Espirange substation (Option 5A and A1b) entire route is preferred over all other line routes.

Table 8: Summary of Alternative ratings for each Sections.

	Alternative A			
	Section 1		Section 2 (Bon Espirange)	
	Option 5A	Option 6A	Option A1a	Option A1b

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Option not viable	1	1	2	1		
Option possibly viable	0	0	0	0		
Option preferred	2	2	2	1		
	Alternative B					
	Section 1		Section 2 (Komsberg)			
	Option 5B	Option 6B	Option B1			
Option not viable	1	1	1			
Option possibly viable	0	0	0			
Option preferred	2	2	2			
	Alternative C					
	Section 1		Section 2		Section 3	
	Option 5C	Option 6C	Option CH1a	Option CH1b	Option CH2a (Bon Espirange)	Option CH2b (Komsberg)
Option not viable	0	0	1	1	0	0
Option possibly viable	0	0	1	1	0	0
Option preferred	3	3	1	1	3	3

5. Revised Layout following Authority comment and environmental impact assessment

Substation alternative 5 (preferred alternative) was rotated less than 45 degrees in order to avoid the 200m buffer zone proposed around high-sensitive bat areas identified by an assessment undertaken for the WEF. It should be noted that the bat sensitivity buffer was only recommended for wind turbine positions and are not applicable to the other infrastructure. However, the layout was amended nonetheless. There were no avifaunal, heritage or surface water features identified in the vicinity of the 33/132kV onsite substation 5. Substation position 5 are located within a medium-low ecological sensitive area and therefore no further amendments are required to the layout.

Substation alternative 6 was shifted 50m west from the initial proposed location in order to avoid the 200m buffer zone proposed around high-sensitive bat areas identified by an assessment undertaken for the WEF. It should be noted that the bat sensitivity buffer was only recommended for wind turbine positions and are not applicable to the other infrastructure. However, the layout was amended nonetheless. There were no avifaunal, heritage or surface water features identified in the vicinity of the 33/132kV onsite substation 6. Substation position 6 are located within a medium-low ecological sensitive area and therefore no further amendments are required to the layout.

132kV distribution line 200m buffer corridors. The majority of the corridors remained unchanged as the sensitive features identified can be avoided through micro-sitting the pylon positions. However, a slight shift in the corridors were needed in order for it to align with the newly amended positions for the onsite substations 5 and 6. The 132kV distribution line corridors (200m) were shifted slightly in order to connect with the amended substation position 5, 6 and central hub-substation. The majority of the corridor remained unchanged as the watercourses and 32m buffer zone, wetlands, heritage features and associated buffers and avifaunal sensitive areas can be avoided through micro-sitting within the 200m corridor.

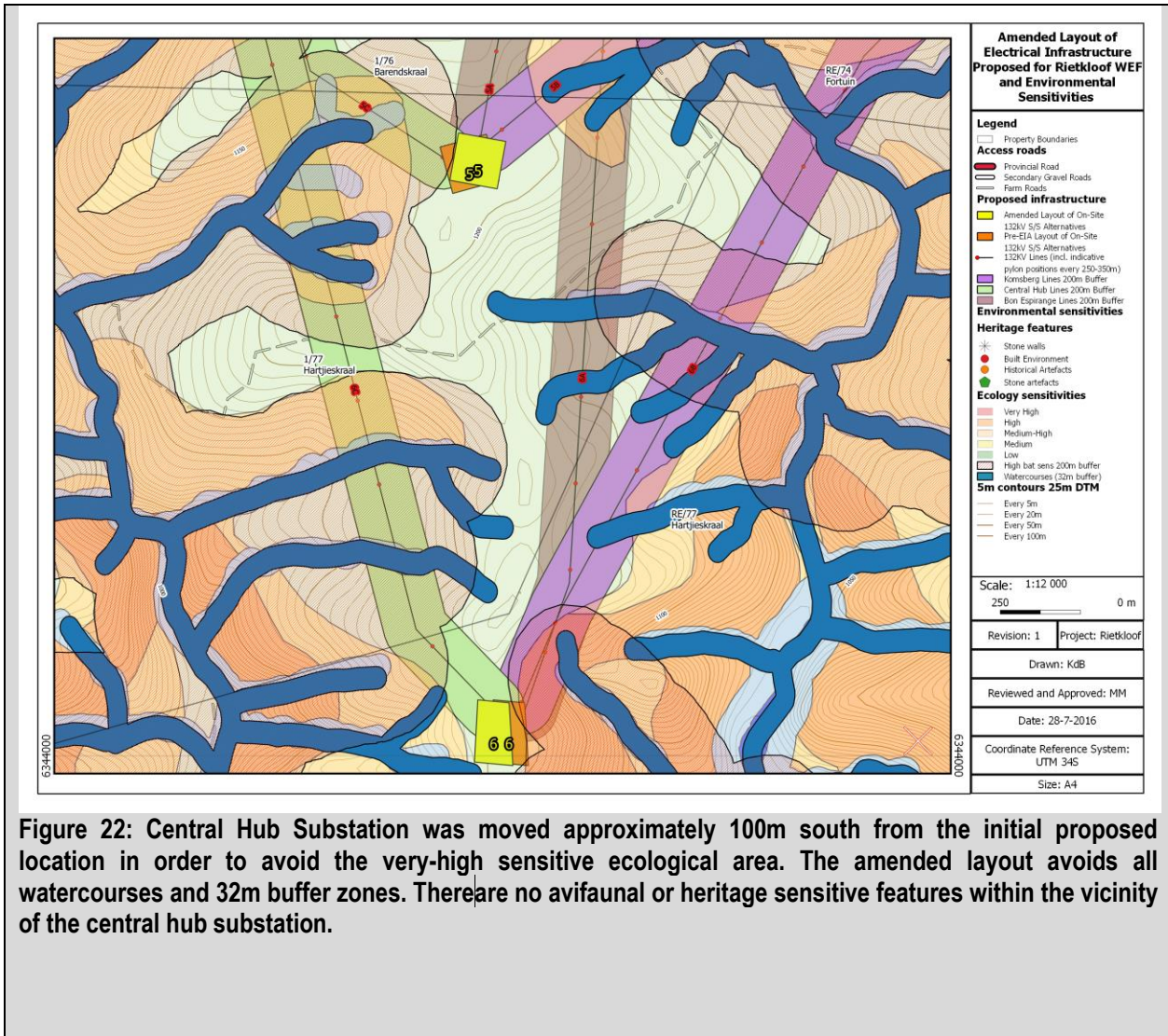


Figure 22: Central Hub Substation was moved approximately 100m south from the initial proposed location in order to avoid the very-high sensitive ecological area. The amended layout avoids all watercourses and 32m buffer zones. There are no avifaunal or heritage sensitive features within the vicinity of the central hub substation.

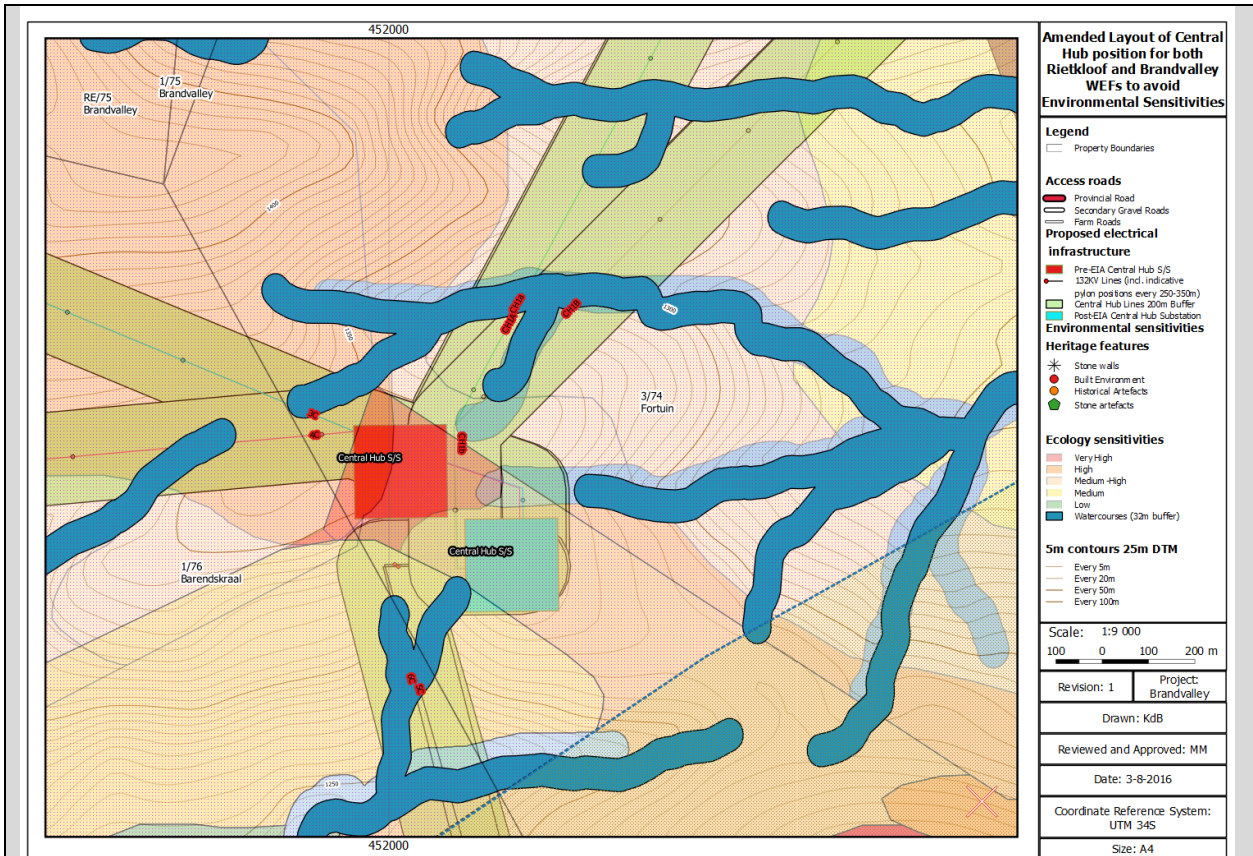


Figure 23: Amended Layout of Central Hub Position for both Rietkloof and Brandvalley to avoid Environmental Sensitivities.

b) Conclusion

Route **Alternative A starting at Substation 5 and ending at Bon Espirange substation (Option 5A and A1b)**. Option A1a covers the shortest distance and is thus the technically preferred option. However, option A1b is environmentally preferred since it eliminates impacts associate with the highly sensitive bird corridor, option A1b is placed north of the bird corridor and does not cross it. However Option 5A is ecologically less preferred since the line, associated pylons and road access cross an area of very high ecological sensitivity. Option 5A is acceptable with the implementation of suitable mitigation i.e. to undertake walkthrough of the positions where pylons are to be constructed by an ecological specialist as well as potentially limit road access to either side of the very high sensitive area and not cross it.

This preferred route alternative is illustrated in Figure 24 below and includes the showing approximate size of the servitude.

Preferred Alternative

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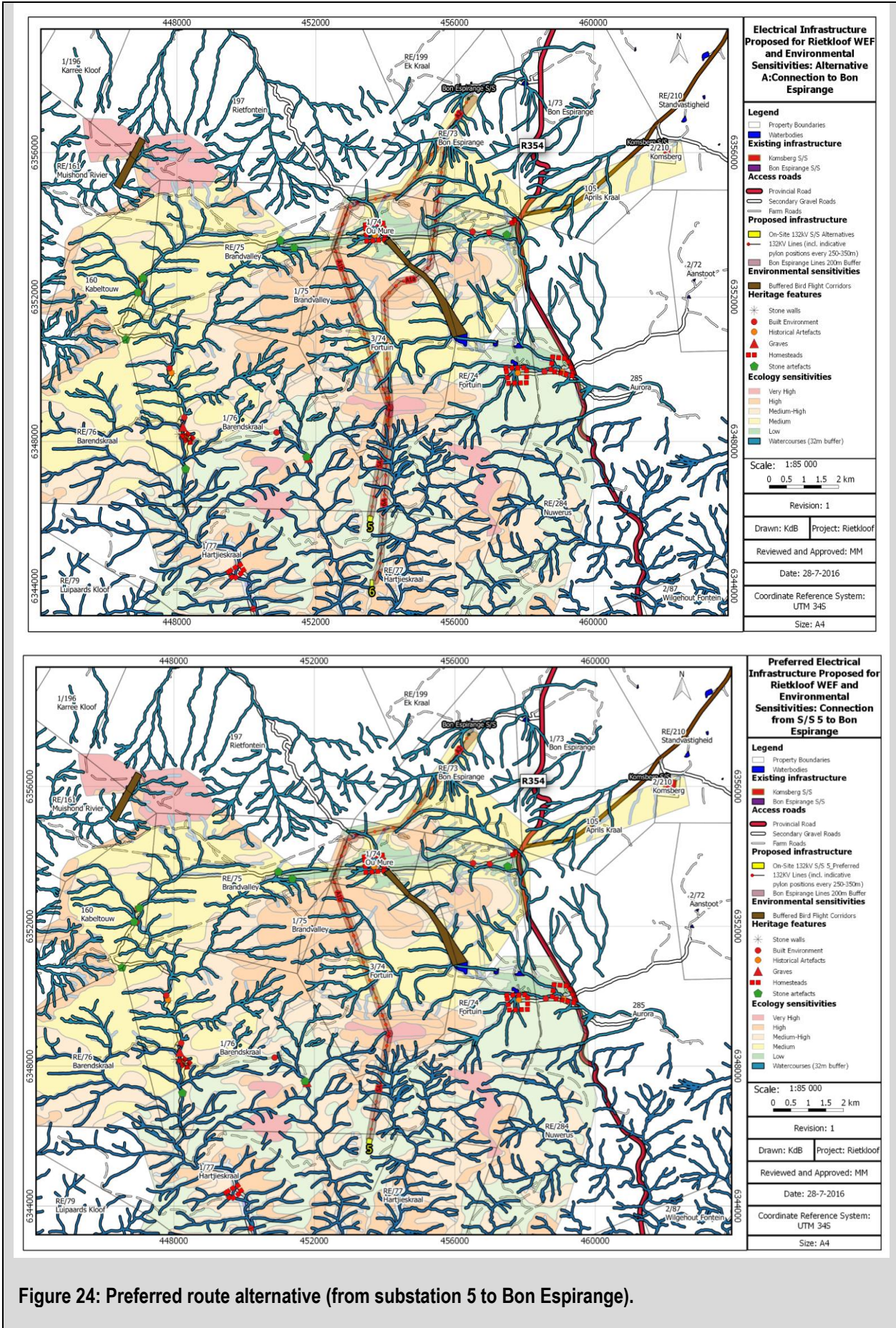


Figure 24: Preferred route alternative (from substation 5 to Bon Espirange).

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Impact summary after mitigation	
The following summarises the impact categories after mitigation for all three alternatives.	
Impact description	Significance category – AFTER mitigation
Archaeological Impact Assessment	
Destruction of precolonial / stone age material during construction	MODERATE -
Destruction of Stone Walling Features during construction	MODERATE -
Impact to Homesteads / Farmhouse Complexes during construction	MODERATE -
Impact to formal and informal graves	MODERATE -
Impact of the construction of the proposed Substation and Powerlines on the cultural landscape	MODERATE -
Cumulative impacts on heritage resources	MODERATE -
Palaeontological Impact Assessment	
Impact to fossil heritage resources	LOW -
Cumulative Impact to fossil heritage resources	LOW -
Avifaunal Impact Assessment	
Disturbance during construction of the sub-stations and power lines (relevant to all power line alternatives and all four sub-station locations).	LOW -
Loss of habitat as result of grounded features – namely the sub-stations, pylon bases, and associated service tracks during the construction phase.	MODERATE -
Bird mortality through collision with the overhead lines during the operational phase (relevant to all powerline alternatives).	MODERATE -
Cumulative Impact : <ul style="list-style-type: none"> • Electrocutation • Habitat Destruction • Displacement • Solar Array Collision • Wind Turbine Collision • Powerline Collision 	LOW -
Social Impact Assessment	
Social and visual impact of power line	LOW -
Cumulative impact	LOW -
Ecological Impact Assessment	
Impact on vegetation and listed plant species due to transformation within the development footprint.	LOW -
Direct faunal impacts due to construction phase noise and physical disturbance.	LOW -
Following construction, the site will be highly vulnerable to soil erosion	LOW -
Following construction, the site will be highly vulnerable to alien plant invasion	LOW -
Faunal Impacts due to Decommissioning Phase activities such as noise and disturbance due to the presence of construction staff and the operation of heavy machinery	LOW -
Soil Erosion Risk	LOW -
Alien plant invasion will be highly likely within disturbed areas following decommissioning	LOW -
Impacts on Critical Biodiversity Areas and broad-scale ecological processes	LOW -
Traffic Impact Assessment	
he transport of electrical components, including mast, cables, connectors and transformers will contribute to the overall traffic in the area.	LOW -
6.2 Although unlikely, should the construction phase of the project coincide with many of the other regional WEF and 132kV line projects, an elevated traffic impact will occur.	LOW -
Summary impact assessment for impacts assessed by EAP.	
Impact summary	Significance category – AFTER mitigation

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Visual Impacts	
Visual impact on sense of place.	LOW -
Combined visual impact from WEF and power line type projects within the region.	MODERATE -
Surface Water Impacts	
Micro-siting of pylons may induce impact on river or wetland features	LOW -
Cumulative	LOW -
Erosion Impacts	
Areas disturbed during construction will remain vulnerable to disturbance for some time into the operational phase and will require regular maintenance to ensure that erosion is minimised.	LOW -
Decommissioning will result in disturbance which will leave the site vulnerable to erosion.	LOW -
Cumulative soil erosion from adjacent project works	LOW -
Impact to soil and land capabilities	
Loss of agricultural land.	LOW -
Cumulative soil erosion from adjacent project works	LOW -
Impact on energy production	
Positive indirect impact to national energy production nationally	MODERATE +
Noise impact	
Noise impacts associated with the construction phase	LOW -
Dust impact	
Impact of dust on SALT, SKA or SAAO during construction phase	LOW -

Cumulative Impacts

The cumulative impacts for the power lines need to be considered against all other planned or proposed renewable energy projects surrounding the project area and within Renewable Energy Development Zone (REDZ), given that the WEF itself will result in more spatially spread and significant cumulative impacts than the power line project in isolation. Accordingly, the specialist findings indicate that the cumulative impact of the proposed project is of **low** (negative) significance after mitigation, with the exception of archaeological cumulative impacts (moderate negative) and visual cumulative impacts (moderate negative). Archaeological and visual impacts can be mitigated from high (negative) to moderate (negative) while ecological impacts can be mitigated from moderate (negative) to low (negative).

The interconnecting power lines are deemed to be of low overall environmental significance in relation to other renewable energy projects and their associated infrastructure due to the limited development footprint and the fact that the visual impacts are limited to the direct landowners and run within the existing servitude of the 765kV Eskom power line for 5km and the existing 400kV power line before linking to the Bon Espirange substation. The proposed power line application should be viewed within the context of the WEF located within the REDZ, an area identified for the development of renewable energy projects.

No-go alternative (compulsory)

The following summarises the impact categories for this option. Please note, with the no-go option mitigation is not included.

Impact summary	Significance category – NO mitigation
Loss of plant Species of Conservation Concern	LOW -

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Cumulative impacts for loss of plant Species of Conservation Concern	MODERATE -
Loss of animal SCC	LOW -
Faunal disturbance	LOW -
Farming activities damage existing heritage resources in the future	MODERATE -
Modification of natural flow regime from agricultural activities (dams, boreholes etc)	MODERATE -
Erosion from ongoing farming activities	MODERATE -
Invasive species encroachment	MODERATE -
Cumulative infestation from the combined disturbance of soil through grazing and other agricultural activities	HIGH -

The no-go option is represented by the development not proceeding, and the dominant land use of the region, in this case that of agricultural, to persists into the indefinite future. While many of the project related impacts will thus be absent, the notable societal benefits will also be removed. Additionally, the option of continued agriculture is not without its own impacts, stemming mainly from plant and animal SCC loss through disturbance, mortality and habitat loss, as well as creation an environment for the proliferation of invasive alien plant species.

While this option still has less impact than the overall project related impacts (regardless of which alternative is selected), the loss of societal benefit makes this the less attractive option, especially in the light of the fact that this project proceeding will not reduce the agricultural potential and capacity already present within the project area.

SECTION E. RECOMMENDATION OF PRACTITIONER

Is the information contained in this report and the documentation attached hereto sufficient to make a decision in respect of the activity applied for (in the view of the environmental assessment practitioner)?

YES	
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If “NO”, indicate the aspects that should be assessed further as part of a Scoping and EIA process before a decision can be made (list the aspects that require further assessment).

No further aspects are deemed necessary.

If “YES”, please list any recommended conditions, including mitigation measures that should be considered for inclusion in any authorisation that may be granted by the competent authority in respect of the application.

EAP opinion

The decision regarding whether to proceed with the proposed development was based on weighing up of the positive and negative impacts as identified and assessed by the independent specialists. In addition to the findings of the specialist studies, it is also necessary to consider the following when making a decision:

4. The majority of the impacts associated with the proposed project can be mitigated by applying specialist study and general findings and recommendations in this report;
5. The nature of the site on which the facility is to be sited is suited to the development proposal, and falls within a strategically identified REDZ;
6. The project applicant has taken the issues raised by interested and affected parties into consideration;
7. The project has extensive potential environmental and socio-economic benefits including the generation of clean energy for the Western Cape, and
8. The WEF project, for which this electrical infrastructure project is based, will directly and indirectly contribute to significant social upliftment through a community development trust and skills transfer in accordance with the REIPPPP.

Based on the above, it is believed that with appropriate mitigation, the benefits of the proposed Rietkloof electrical infrastructure will outweigh the negative impacts and it is the opinion of the EAP that the No-Go option should not be considered any further and that the proposed development should be granted authorisation.

Preferred alternatives

Technical feasibility results have indicated that the shorter lines are favourable, as they incur less construction and operation costs, and are more effective in terms of power transmission and loss (cost effective per unit metre of conductor). Environmental concerns also indicate that the shorter line will be preferred, provided it does not incur other environmental impacts. This is because a shorter line would incur less avifaunal impact, which is a major concern for distribution line type projects.

Based on the different grid connection options available to the developer (Komsberg, shared central Hub Substation or Bon Espirange) and the various onsite 132kV substation positions, the selection of the preferred distribution line was dependant on the following factors:

7. What the environmental sensitivities indicate regarding the line layout;
8. What the costs involved and practical considerations are for the line layout; and
9. What the technical considerations are regarding the line layout.

Based on the findings of the specialist studies and the EAP screening process, the following alternatives are environmentally, socially and technically preferred:

- **Location alternatives: Rietkloof project area**
- **Layout alternatives: Substation 5 and the 132kV overhead distribution line to Bon Espirange**

(Alternative 5A and A1b)

- **Technology alternative: overhead 132kV distribution**

The following should be conditions to the Environmental Authorisation:

Recommendations of the Heritage Specialist:

- The heritage impact assessment was submitted to Heritage Western Cape (HWC), the heritage authority for any Western Cape developments. A Notice of Intention to Develop was submitted to the HWC together with the copies of the impact assessment reports in order to satisfy this recommendation.
- An archaeological heritage walk-through survey of the final layout of the power lines must be conducted to assess the changes where further recommendations and mitigatory measures may be made if necessary.
- To avoid negative impacts to these features a 20-30m buffer is recommended around Stone Wall Features and Historical Artefact Scatters.

Recommendations of the Avifaunal Specialist:

- Clear only areas where absolutely necessary, not from the entire servitude of the power line;
- Minimize the number of service tracks;
- Power line routes should be avoided:
 - Near Fortuin dam;
- Should it not be possible to avoid the col, diverters at 5m intervals along all power line spans between across the col;
- Any powerlines across the col between Ou Mure and for that section to have day night visible bird flight diverters at 2m intervals;
- Avoid constructing the substations during the main breeding season for local birds, which is the period August to October inclusive, as far as possible.

Recommendations of the Ecological Specialist:

- All above-ground infrastructure should be removed from the site at decommissioning and rehabilitation. Below-ground infrastructure such as cabling can be left in place if it does not pose a risk, as removal of such cables may generate additional disturbance and impact.
- All cleared areas should be revegetated with indigenous perennial shrubs and grasses from the local area. These can be cut when dry and placed on the cleared areas if natural recovery is slow.
- All construction vehicles should adhere to a low speed limit (40km/h for cars and 30km/h for trucks) to avoid collisions with susceptible species such as snakes and tortoises and rabbits or hares. Speed limits should apply within the facility as well as on the public gravel access roads to the site.
- All disturbed and cleared areas should be revegetated with indigenous perennial shrubs and grasses from the local area.
- All erosion problems observed should be rectified as soon as possible, using the appropriate erosion control structures and revegetation techniques.
- All hazardous materials should be stored in the appropriate manner to prevent contamination of the site. Any accidental chemical, fuel and oil spills that occur at the site should be cleaned up in the appropriate manner as related to the nature of the spill.
- All personnel should undergo environmental induction with regards to fauna and in particular awareness about not harming or collecting species such as snakes, tortoises and owls.
- All roads and other hardened surfaces should have runoff control features which redirect water flow and dissipate any energy in the water which may pose an erosion risk.
- Any potentially dangerous fauna such snakes or fauna threatened by the construction, operational or decommissioning activities should be removed to a safe location.
- Any roads that will not be rehabilitated should have runoff control features which redirect water flow and dissipate any energy in the water which may pose an erosion risk.
- Avoid impact to potential corridors such as the riparian corridors associated with the larger drainage lines within the facility area.
- Demarcate all areas to be cleared with construction tape or similar material. However, caution should be

exercised to avoid using material that might entangle fauna.

- Development within the Very High Sensitivity areas should proceed with caution.
- Due to the disturbance at the site alien plant species are likely to be a long-term problem at the site following decommissioning and regular control will need to be implemented until a cover of indigenous species has returned.
- Due to the disturbance at the site as well as the increased runoff generated by the hard infrastructure, alien plant species are likely to be a long-term problem at the site and a long-term control plan will need to be implemented. Problem woody species such as *Prosopis* are already present in the area (mainly along riverine habitats) and are likely to increase rapidly if not controlled.
- During construction any fauna directly threatened by the construction activities should be removed to a safe location by the ECO or other suitably qualified person.
- Ensure that temporary infrastructure areas are within low sensitivity areas, preferably previously transformed areas if possible.
- Erosion management should take place according to the Erosion and Rehabilitation Plan.
- If any parts of site such as construction camps must be lit at night, this should be done with low-UV type lights (such as most LEDs), which do not attract insects and which should be directed downwards.
- No dogs or cats should be allowed on site apart from that of the landowners.
- No fires should be allowed within the site as there is a risk of runaway veld fires.
- No fuelwood collection should be allowed on-site.
- Preconstruction environmental induction for all construction staff on site to ensure that basic environmental principles are adhered to. This includes awareness as to no littering, appropriate handling of pollution and chemical spills, avoiding fire hazards, minimizing wildlife interactions, remaining within demarcated construction areas etc.
- Regular alien clearing should be conducted using the best-practice methods for the species concerned. The use of herbicides should be avoided as far as possible.
- Regular monitoring for alien plants within the development footprint as well as adjacent areas which receive runoff from the facility as there are also likely to be prone to invasion problems.
- Regular monitoring for erosion after construction to ensure that no erosion problems have developed as result of the disturbance.
- The illegal collection, hunting or harvesting of any plants or animals at the site should be strictly forbidden. Personnel should not be allowed to wander off the construction site.
- The recovery of the indigenous shrub layer should be encouraged through leaving some areas intact through the construction phase to create a seed source for adjacent cleared areas.
- Topsoil should be set aside and replaced after construction to encourage natural regeneration of the local indigenous species.

Recommendations of Palaeontologist:

- Given the low impact significance and the fact that the entire development footprint has been previously assessed, no further specialist palaeontological studies are considered necessary in this regard.
- Given the potential for scientifically important chance fossil finds during the construction phase, the following recommendations for palaeontological monitoring and mitigation should be included within the Environmental Management Programme for the 132 kV distribution lines:
 - The Environmental Control Officer (ECO) responsible for the 132 kV distribution lines should be made aware of the possible occurrence of scientifically-important fossil remains within the development footprint.
 - During the construction phase all major clearance operations (e.g. for new access roads, pylon placements) and deeper (> 1 m) excavations should be monitored for fossil remains on an on-going basis by the ECO.
 - Should substantial fossil remains - such as vertebrate bones and teeth, or petrified logs of fossil wood - be encountered at surface or exposed during construction, the ECO should safeguard these, preferably in situ. They should then alert the relevant Heritage Management Authority as soon as possible (i.e. Western Cape: Heritage Western Cape (HWC). Protea Assurance Building, Green Market Square, Cape Town 8000. Private Bag X9067, Cape Town 8001. Tel: 086-142 142. Fax: 021-483 9842. Email: hwc@pgwc.gov.za.

Northern Cape: South African Heritage Resources Agency (SAHRA). Dr Ragna Redelstorff. Heritage Officer Archaeology, Palaeontology & Meteorites Unit, SAHRA. 111 Harrington Street, Cape Town, 8001. Tel: +27 (0)21 202 8651. Fax: +27 (0)21 202 4509. Email: rredelstorff@sahra.org.za). This is to ensure that appropriate action (i.e. recording, sampling or collection of fossils, recording of relevant geological data) can be taken by a professional palaeontologist at the developer's expense.

Key findings/ Recommendations of the Transport Engineer:

- The imported freight will preferably be transported from Saldanha Port to the site. The preferred freight route from Saldanha Port, via Moorreesburg (a distance of 342km), comprises surfaced roads for the majority of the way (only the final road section to the site consists of gravel roads). This route is predominantly on National or Provincial Roads, with suitable conditions for the transport of normal freight, or abnormal loads with permits. No toll fees are required on this route, however, abnormal permits will be required for the transport of the transformers and turbine components, irrespective of the final route determined by the logistics contractor.
- Building materials will most likely be transported from Worcester, while certain elements will be transported from various manufacturing centres in South Africa - most likely Cape Town for tower sections and Johannesburg for transformers. The transport of elements from these manufacturing centres will be predominantly on National and Provincial roads, which presents no limitations for normal freight.
- Due to the distance from Worcester to site (approximately 155km), significant reductions in heavy vehicle trips could be achieved by sourcing road building materials and concrete aggregate from new quarries or borrow pits in proximity to the site, provided that it is a feasible with respect to the target implementation programme. The possible siting of quarries and/or borrow pits will be confirmed prior to construction, once a geotechnical investigation has been conducted.
- There is a limited risk of delays to the various deliveries required for the construction of the facility, due to potential routine maintenance works (such as repairs and reseals). The impact of such activities is dependent on the scheduling of deliveries and of roads contracts, and may be mitigated by the use of the alternative routes proposed in this report.
- In general, no obvious problems were identified associated with the transport of freight along the proposed routes to the site, nor for the accesses required for the construction and maintenance of the facility. It will, however, be necessary to confirm certain aspects such as clearances, bridge capacities, etc., by the logistics contractor as part of their preparation as this will be dependent on the actual vehicles configuration used.

Recommendations from the Social specialist:

- It is recommended that the Rietkloof WEF be supported, subject to the implementation of the recommended mitigation measures and management actions contained in the SIA report.
- In this regard it is recommended that the Western and Northern Cape Provincial Governments, in consultation with the KHLM, LLM and WLM and the proponents involved in the development of renewable energy projects in the Komsberg REDZ, consider the establishment of a Development Forum to co-ordinate and manage the development and operation of renewable energy projects in the Komsberg REDZ, with the specific aim of mitigating potential negative impacts and enhancing opportunities.

Recommendations of the EAP:

It is the recommendation of the EAP that the Rietkloof 132kV distribution line project can be considered acceptable from an environmental perspective, provided the options are reroute around the very-high ecological sensitivity. The EAP is confident that this will be possible due to the 200m buffer zone and the additional walkthrough that will be undertaken by the ecologist in August 2016 to verify the sensitivity of the area. Based on the nature and extent of the proposed project, all other potential impacts associated with the proposed project can be mitigated to an acceptable level. As such, it can be authorised for line option: **Substation 5 and the overhead 132kV distribution line Alternative A (Route 5A and A1b) (preferred alternative)**, should the following mitigation measures be applied:

- Route 5A is rerouted around the very high ecological sensitive area to be confirmed through a walkthrough

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by the ecologist.

- Should that not be technically possible, the recommended approach for mitigation would be to undertake walkthrough of the positions where pylons are to be constructed by an ecological specialist as well as potentially limit road access to either side of the very high sensitive area and not cross it.
- The EMPr should form part of the contract with the Contractor appointed to construct the proposed package plant, and must be used to ensure compliance with environmental specifications and management measures.
- An independent Environmental Control Officer (ECO) should be appointed to monitor compliance with the specifications of the EMPr for the duration of the construction period.
- An alien species monitoring and management plan should be developed for the construction phase and the first three years of operation, to ensure as little as possible establishment and maximum control of invasive species on site. This is important mainly due to the agricultural damage that spreading invasive species may have, in a predominantly agricultural setting.
- Disturbed areas should be rehabilitated as soon as possible once construction is complete in an area.
- A walk-through survey of the final substation site and power line tower positions should be undertaken by an ecologist and heritage specialist to determine any additional site-specific mitigation which should be implemented.
- The ecologist should scan the area for any frog and reptile micro-habitats when undertaking the final site walkthrough to inform the final site development plan.
- All bird nests identified during the 12 month bird monitoring campaign should be avoided. The developer should obtain all necessary permits prior to the commencement of construction.
- All feasible mitigation measures recommended by the three specialist's studies should be strictly adhered to.
- Final EMPr should be approved by DEA prior to construction.

Proposed project description for authorisation:

1. 132kV onsite substation yard 200m x 200m in extent (Substation Alternative 5).
2. 200m corridor (100m buffer either side) for the 132kV overhead distribution line between Substation 5 and the Bon Espirange Substation. Final servitude will be 31m.

Coordinates of the preferred 132kV overhead distribution line and substation for Rietkloof Wind Energy Facility

Table 9: Coordinates of the proposed onsite 132kV substations and 132kv powerline.

Alternative	Latitude	Longitude
Alternative 5 (preferred alternative)		
Centre point	-33.02480	20.50275
Corner point 1	-33.02401	20.50213
Corner point 2	-33.02425	20.50371
Corner point 3	-33.02558	20.50341
Corner point 4	-33.02534	20.50183
132kv Powerline (Preferred route option (200m corridor from substation 5 to Bon Espirange substation) km in length		
Start	-33.02483	20.50273
Bend point 1	-32.99702	20.50895
Centre	-32.96472	20.49543
Bend point 2	-32.95701	20.49210
Bend point 3	-32.94704	20.49652
Bend point 4	-32.94667	20.49874
Bend point 5	-32.94592	20.49895
Bend point 6	-32.94348	20.51345
End	-32.91996	20.53532

Way forward

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This Final BAR is prepared for submission to the DEA for decision-making. Upon thorough examination of this Final BAR, the authority will issue a decision which either accepts or rejects the report. Should the BAR be accepted, the authority will then issue an authorisation which will either grant (positive) environmental authorisation or not grant (negative) authorisation. Should an Environmental Authorisation (EA) be granted, it usually carries Conditions of Approval. The applicant is obliged to adhere to the EA conditions.

Within a period determined by the competent authority, all registered I&APs will be notified in writing of (i) the outcome of the application, (ii) the reason for the decision and the (iii) process to appeal the decision.

Is an EMPr attached?

YES

The EMPr must be attached as Appendix G.

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The details of the EAP who compiled the BAR and the expertise of the EAP to perform the Basic Assessment process must be included as Appendix H.

If any specialist reports were used during the compilation of this BAR, please attach the declaration of interest for each specialist in Appendix I.

Any other information relevant to this application and not previously included must be attached in Appendix J.

Mr Marc Hardy

NAME OF EAP

SIGNATURE OF EAP

DATE

SECTION F: APPENDIXES

The following appendixes must be attached:

APPENDIX A: MAPS

APPENDIX B: PHOTOGRAPHS

APPENDIX C: FACILITY ILLUSTRATION(S)

APPENDIX D: SPECIALIST REPORTS (INCLUDING TERMS OF REFERENCE)

APPENDIX E: PUBLIC PARTICIPATION

APPENDIX F: IMPACT ASSESSMENT

APPENDIX G: ENVIRONMENTAL MANAGEMENT PROGRAMME (EMPR)

APPENDIX H: DETAILS OF EAP AND EXPERTISE

APPENDIX I: SPECIALIST'S DECLARATION OF INTEREST

APPENDIX J: ADDITIONAL INFORMATION

APPENDIX K: IMPACT ASSESSMENT METHODOLOGY

APPENDIX L: ASSESSMENT METHODOLOGY FOR RANKING ALTERNATIVES

APPENDIX M: TITLE DEEDS

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