ENVIRONMENTAL IMPACT ASSESSMENT FOR THE BLANCO (NARINA) TO DROËRIVIER 400KV TRANSMISSION LINE, AND SUBSTATION UPGRADE

DRAFT ENVIRONMENTAL SCOPING REPORT & PLAN OF STUDY FOR EIA

Public Review Period: 11 January 2017 – 10 February 2017

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ABBREVIATIONS AND ACRONYMS

AIA	Archaeological Impact Assessment
DEA	Department of Environmental Affairs
DEA&DP	Western Cape Department of Environmental Affairs & Development Planning
DEIR	Draft Environmental Impact Report
DSR	Draft Scoping Report
DWS	Department of Water and Sanitation
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
EC DEDEAT	Eastern Cape Department of Economic Development, Environmental Affairs & Tourism
EIA	Environmental Impact Assessment
EIR	Environmental Impact Report
EMP	Environmental Management Programme
GA	General Authorisation in terms of Section 39 of the NWA
FSR	Final Scoping Report
GN	Government Notice
ha	Hectares
HIA	Heritage Impact Assessment
HW	Heritage Western Cape
I&APs	Interested and Affected Parties
IEM	Integrated Environmental Management
IRP	Integrated Resource Plan
MW	Mega Watt
mm	Millimetres
NEMA	National Environmental Management Act, 1998 (Act No. 107 of 1998)
NEMBA	National Environmental Management Biodiversity Act, 2004 (Act No. 10 of 2004
NEMWA	National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008)
NHRA	National Heritage Resources Act, 1999 (Act No. 25 of 1999)
NID	Notice of Intend to Develop
NWA	National Water Act, 1998 (Act No. 36 of 1998)
NSBA	National Spatial Biodiversity Assessment
PoS	Plan of Study
PV	Photo Voltaic
SARCA	South African Reptile Conservation Assessment
SAHRA	South African Heritage Resources Agency
S&EIR	Scoping and Environmental Impact Reporting
SDF	Spatial Development Framework
SIA	Social Impact Assessment
VIA	Visual Impact Assessment
WCHRA	Western Cape Heritage Resources Agency
WULA	Water Use License Application

INVITATION TO COMMENT ON THE DRAFT SCOPING REPORT

Envirolution Consulting (Pty) Ltd was appointed by Eskom Holdings SOC Limited to conduct the Environmental Impact Assessment (EIA) Process for the proposed construction of the Blanco-Droërivier 400kV Power line and Substations upgrade. The development entails the construction of a 200km long 400kV transmission power line from Blanco Substation to the Droërivier Substation at Beaufort West in the Western Cape Province. The alternative route that is investigated is located in the Eastern Cape Province.

The EIA process for the proposed construction of the Blanco to Droërivier 400kV Power line and Substation commenced in early 2015 with the reference number: 14/12/16/3/3/2/922. This application has however lapsed in accordance with Regulation 23 (1) of the EIA Regulations, 2014 and a new EIA process is currently being initiated. This new process entails (1) the resubmission of a new application to DEA and the project will be assigned a new reference number, (2) the release of a Draft Scoping Report (DSR) to be followed by a Draft Environmental Impact Assessment (DEIA) Report for public review and thereafter (3) submission the final reports to DEA for decision-making.

It must be noted that the contents of both the Draft Scoping and the Draft EIA report will not change as the scope of the project and the environment still remains the same. Please advise if your comments have remained the same or if you have additional or new comments.

For new comments, members of the public, local communities and stakeholders are invited to comment on the Draft Scoping Report which has been made available for public review and comment at the following locations from **11 January 2017 – 10 February 2017:**

- The Envirolution website at www.envirolution.co.za
- Dropbox link sent to registered I&APs
- George Public Library and Beaufort West Public Library

Please submit your comments to:

Company Name:	Envirolution Consulting (Pty) Ltd
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Comments can be made as written submission via fax, post or e-mail.

EXECUTIVE SUMMARY

I. INTRODUCTION

Envirolution Consulting (Pty) Ltd was appointed by Eskom Holdings SOC Limited to conduct the Environmental Impact Assessment (EIA) Process for the proposed construction of the Blanco-Droërivier 400kV Power line and Substations upgrade. The development entails the construction of a 200km long 400kV transmission power line from Blanco Substation to the Droërivier Substation at Beaufort West in the Western Cape Province. The alternative route that are investigated is located in the Eastern Cape Province.

***Another application will be submitted for the construction of a 50-60km long 400kV Transmission power line from the Gourikwa Substation at Mossel Bay to the Blanco Substation at George, and that ***impact assessment will be presented in a seperate Scoping report**.*

In terms of the NEMA EIA Regulations (2014), published in Government Notice R. 982 in Government Gazette No. 38282 of 4 December 2014, under Section 24(5) of the National Environmental Management Act, 1998 (Act No.107 of 1998), a Scoping & Environmental Impact Assessment are required for the development due to the following listed activities (NEMA EIA Regulations 982, 984, 985,):

- The development of infrastructure or structures covering 50 square metres or more - Listing 2 (**12**);
- 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 a watercourse – Listing 1 (**19**);
- The development of a road with a reserve wider than 13,5 meters, or where no reserve exists where the road is wider than 8 metres - Listing 1 (**24**)
- The expansion of facilities for the transmission and distribution of electricity where the expanded capacity will exceed 275 kilovolts and the development footprint will increase - Listing 1 (**47**)
- Development of infrastructure for transmission and distribution of electricity (with a capacity of 275kV or more outside an urban area) - Listing 2 (**9**),
- The clearance of an area of 20 hectares or more of indigenous vegetation - Listing 2 (**15**),
- Development of masts or towers for telecommunication or radio transmission - Listing 3 (3)
- Development of a road wider than 4 meters but less than 13,5 meters - Listing 3 (**4),**
- Clearance of an area of 300 sqm or more of indigenous vegetation except - Listing 3 (**12**),
- The development of infrastructure or structures with a physical footprint of 10 square metres or more within a watercourse; Listing 3 (14),

The National Department Environment Affairs (DEA) will be the relevant decision-making authority as Eskom is a parastatal. The EIA authorisations need to be granted by the DEA for approval and setting of conditions prior to commencement of any construction activities.

The development also triggers activities that require a Water Use License because it crosses several water courses. Therefore, before construction activities may take place, the activity will require a Water Use License as per requirement in the National Water Act (Act No.36 of 1998) (NWA) under Section 21(c) and (i) Water Uses. In terms of the NWA, this development requires a Water Use License as per the following regulations:

- Section 21(c) impeding or diverting the flow of water in a watercourse and;
- Section 21 (i) altering the bed, banks, course or characteristics of a watercourse.

II. PROJECT DESCRIPTION

The study area is located within the boundaries of the Cacadu District Municipality, in the Eastern Cape Province and the Central Karoo District Municipality in the Western Cape Province. Refer to Appendix A for a map giving an overview of the study area.

The Droërivier Transmission Substation (TSS) is owned and operated by a TNSP (Transmission Network Service Provider), which is a legal entity that is licensed to own, operate, and maintain a transmission network. Eskom Holdings SOC Ltd has appointed Envirolution Consulting (Pty) Ltd to undertake the EIA process for this project.

III. NEED FOR THE PROJECT

Eskom Holdings is the biggest producer of electricity in South Africa; it also transmits electricity via a transmission network which supplies electricity at high voltages to a number of key customers and distributors. Eskom is a vertically integrated company licensed to generate, transmit and distribute electricity. The transmission licence is held by Eskom Transmission, the Transmission network service provider (TNSP). Planning the transmission network is the responsibility of the Grid Planning Department in the Transmission Division.

According to the Eskom Transmission Ten Year Development Plan 2011-2021 (TDP), the 400kV transmission lines are a result of the development of a more meshed transmission 400kV network to provide greater reliability and thus improve the levels of national network security. These new transmission lines form part of the long-term strategy to develop a main transmission backbone from which regional power corridors can be supported.

The proposed 400kV transmission power line from the Droërivier Substation to the Blanco (Narina) Substation forms part of the power corridors that will connect generation pools to one another and to the major load centres in the country. This backbone and regional power corridor network structure will allow the increasing system demand to be supplied and the power from new power stations to be integrated more efficiently into the transmission network and distributed where required, both under system-healthy and system-contingency conditions.

The development of the transmission backbone and the associated regional power corridors were reviewed as part of the Strategic Grid Study which considered the potential development scenarios beyond the 10-year horizon of the Transmission Development Plan (TDP) until 2030. The objective of this strategic study was to align the transmission network with the requirements of the generation future options and those of the growing and future load centres. This Strategic Grid Study has enabled the 10-Year TDP to be aligned with the future long-term development of the whole Eskom system.

A Customer Load Network (CLN) is a network within a specific geographical area, which in turn is a subdivision of a Grid. The West Grid consists of four Customer Load Networks, namely Peninsula, Southern Cape, West Coast and Namaqualand. The proposed 400kV Transmission power line from the Blanco (Narina) Substation to the Droërivier Substation forms part of Eskom's West Grid and the Southern Cape CLN.

IV. IDENTIFICATION OF POTENTIAL IMPACTS AND SPECIALIST STUDIES

Potential risks and key issues identified during the Scoping Phase of the project were based on consultation with Interested and Affected Parties (I&AP's), experience with similar developments, desktop studies and current state of the environment of the site. Specialist investigations that will be undertaken during the Scoping and/or EIA process include:

Discipline/ Specialist field	
Land Use/Regional & Town Planning	Faunal Assessment
Public Participation & Facilitation	Economic & Tourism Assessment
Agricultural Assessment	Heritage & Archaeology
Avifauna Assessment	Palaeontological Assessment
Botanical Assessment	Social Impact
Wetlands & River Systems	Visual Impact

The Department of Environmental Affairs (DEA) will advise on further studies that may be required during the EIA phase. Specialist findings will be assessed and discussed in detail in the Environmental Impact Assessment Report (EIR) that will be provided during the EIA phase.

V. PUBLIC PARTICIPATION PROCESS

Interested and Affected Parties, including surrounding and affected landowners, Provincial, National and Local Governments Departments were involved during the Public Participation Process (PPP). The Public Participation Process (PPP) report is attached to this Draft Scoping Report as Appendix 4.1. The summary of the PPP that commenced in March 2015, and continued up to date (September 2016) is summarised as follows:

Written notice was given to owner or person in control of land via registered mail or hand delivery, if the applicant is not the owner or person in control of the land the occupiers of the site where the line is planned and to owners and occupiers of land adjacent to the site where the line is to be erected and to any alternative sites where the line is to be erected. The PPP practitioner visited landowners between March 2015 and May 2015. During the Review period of the DEIA Report, focus group meetings will be held at potential risk areas (19-23 September 2016)

Flyers were distributed to I&APs accompanied by a Background Information document (BID). A registration form with map was distributed. (Knock and drop) from March 2015 to end May 2015

A Newspaper advertisement was placed in The Herald (Eastern cape) on 8 April 2015, "Die Courier " (Western Cape) on 2 April 2015 & Sunday Times (National) on 29 March 2015 requesting Interested and Affected Parties (I&APs) to register, and submit their comments.

Site notices were displayed within the boundaries of the study area from 5 March 2015.

A pre-assumed institutional I &APs database was developed. The database was expanded through networking and fieldwork throughout the process. Background Information Document (BID) and registration form were compiled and forwarded to I&APs registered on the database. These documents were also distributed at versus venues along the route.

Members of the Public Participation Team did site visits from March 2015 to end May 2015, and the technical team visited certain areas in August 2016.

Municipal councillors of the wards in which project alternatives are situated, and the other known organisations that represent the community in the area were informed of the project. This was done by means of invitations to attend the public meetings, where information regarding the project was presented, and opportunity was given for all to raise their concerns. The municipalities with jurisdiction in the project area include the Municipality of Beaufort West, Uniondale, George, and the Eden District Municipality.

Organs of state and other parties that were informed have included Cape Nature, the Eastern Cape DEADP, the Department of Water Affairs and Sanitation, the Western Cape and Eastern Cape Heritage Agencies. The latter departments have received Notifications of Intend to Develop (NIDs).

Focus group meetings were held with the local councillors and various stakeholder groups to discuss the proposed project. These meetings were documented. The PPP and project team visited the area for focus group meetings again during the public review period for the EIA draft report (September 2016).

Comments/ issues were captured into a Comment and Response Report (CRR). Issues and comments raised during the public review period of the Draft Scoping Report informed issues requiring further investigation will be carried over to the EIA Phase.

E-mail correspondence between the EAP, the PP consultant and the public has flown freely since the onset of the project and are added to the documentation on a continuous basis. Some e-mails were sent to I&APs in response to their telephonic or faxed queries

A transparent process was followed. In compliance with regulation 41 (6); the PPP has ensured that information containing all relevant facts in respect of the application or proposed application has been and will be made available to potential interested and affected parties and that participation by potential or registered interested and affected parties is facilitated in such a manner that all potential or registered interested and affected parties are provided with a reasonable opportunity to comment on the application or proposed application.

NB: Addition Issues and comments raised during the public review period of this Draft Scoping Report (together with previous comments for the Scoping) will be submitted to DEA and carried over to the EIA Phase for further consideration where applicable.

VI. ALTERNATIVES/DEVIATIONS CONSIDERED

A Preferred Alternative 1 (red route) and an Alternative 2 route (blue route) have been proposed for the 400 kV transmission line between Blanco (Narina) and Droërivier, The two alternative alignments are proposed within a corridor of 2 km, as indicated in Figure 1 but the actual servitude required will be 55m wide.

Alternative 1:

Alternative 1 (Red) is estimated at about 178 km and is a relative straight line connection (shortest route) between Blanco and Droërivier. The line passes about 16.8km east of Oudtshoorn and crosses over the Groot Swartberg Nature Reserve approximately 14km north-west of De Rust (the nature reserve is stretching over the Swartberg for over 200 km). It loosely runs in a corridor west of the N12 towards the Droërivier substation.

Alternative 2:

Alternative 2 is estimated at 270 km. It uses the same proposed alignment as for the Red corridor till the intersection with the N9 and N12 roads. It loosely follows the N9 in an easterly direction, about 7.6 km east of the Kammanassie Nature Reserve, and west of Uniondale. It departs the N9 just east of the eastern point of the Swartberg Nature Reserve and heads north and north-west towards the Droërivier substation.

Site alternatives for the Droërivier Substation cannot be assessed since the substation already exist and infrastructure will only be upgraded to accommodate the additional line connection. The

location of the new Narina Substation has been authorised by DEA on 1 September 2016, but is yet to be constructed.

In all cases (lines and substations) a No-Go option will be assessed. The project is intended to strengthen the network. With a No GO option, this will not be possible and the occurrence and frequency of power interruptions will an increased risk. Not to construct a line in the area between Droërivier and Blanco will not be in line with the SIPS for the country. This is the main negative impact of a No Go Alternative.

VII. SUMMARY OF FINDINGS

During the Scoping Phase, Alternative 1 is preferred mainly due to the shorter distance which would mean that it would result in a smaller footprint. The Scoping level assessment has however indicated that this route may impact negatively on sensitive vegetation, the Swartberg Nature Reserve (Unesco Heritage Site) and farming activities. Loss of vegetation along the Alternative 2 route could result in a loss of farming land and income. The latter situation needs to be evaluated in specialist agricultural and ecological studies. During the Public Participation Process, **resistance has been given to both alternatives.**

The stakeholder Western Cape has commented on the Project and has made recommendations for reports that are to form part of the EIR. Cape *Nature stated that "Similarly detailed baseline assessments of watercourses, wetlands and associated features are required for consideration*; *as are assessments of the archaeological, paleontological and heritage features within the study domain".* CapeNature would furthermore require a comparative assessment of the sensitivity of the areas proposed for both route alternatives; and specifically an assessment of the sensitivity of the mountainous crossings in the EIA phase, since the proposed Alternative 2 is shown to cross another mountain range (the Kouga Mountain range), which is presumed to be free of powerline servitudes and thus a baseline assessment of this area is required to adequately compare the impacts of both alternatives. Regarding potential Heritage impacts, the NID was submitted to the Heritage Western Cape (HWC), who in their comments did not request paleontological studies for either line Alternatives. HWC has requested that Archaeology and Visual Impacts is investigated in the EIA for the Blanco-Droërivier line, but that a specialist paleontological report will not be required. The Eastern Cape DEDEAT has requested an ecological study in the EIA Phase to synthesise all the biological information so the ecosystem can be understood. No additional comments were received from Cape Nature during the 2016 review period (ended 6 May 2016).

Visual impacts are permanent and cannot be mitigated in full. This issue was raised by most of the Interested and Affected Parties during the Public Participation Process. Due to the agricultural land use of large parts of the study area, the impact on agricultural land is another aspect that needs to be further evaluated in the EIA Phase.

VIII. COMPLIANCE CHECKLIST

The National Environmental Management Act, 1998 (Act No. 107 of 1998), makes provision for regulations to carry out the purposes of the Act. The following checklist was based on the 2014 Regulations (Appendix 2), and will guide the reader to the relevant pages of the report.

The following checklist was based on the **Environmental Impact Assessment Regulations, 2014 (Appendix 2)**, and will guide the reader to the relevant pages of the report.

(2) A scoping report must contain the information that is necessary for a proper	**Referencing in**

understanding of the site selection process, the scope of the assessment and the consultation process to be undertaken through the environmental impact assessment process, and must include—	**this report:**
(a) details of— (i) the EAP who prepared the report; and (ii) the expertise of the EAP including a curriculum vitae.	Paragraph 1.4.3 (p16) Appendix 6
(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;	Appendix 1.3 Appendix 1.4 Appendix 1.5 Maps in Appendix 1.6
(c) a plan which locates the proposed activity or activities applied for 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;	Appendix 1
d) a description of the scope of the proposed activity, including- (i) all listed and specified activities triggered; (ii) a description of the activities to be undertaken, including associated structures and infrastructure;	Heading 2
(e) a description of the policy and legislative context within which the development is proposed including an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks and instruments that are applicable to this activity and are to be considered in the assessment process;	Heading 3
(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;	Heading 2.2.1 (p19)
(h) a full description of the process followed to reach the proposed preferred ativity, site and location including:	Heading 2 (p18)
(i) details of the sites and alternative considered	Appendix 1
(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 Specialist PPP report
(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;	Appendix 4.1 PPP report (9)
(iv) the environmental attributes associated with the alternatives focusing on the geographical, physical, biological, social, economic and cultural aspects;	Heading 4
(v) the impacts and risks 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.	Heading 5 Heading 7 (Assesment)
(vi) the methodology used in determining and ranking the nature, significance, consequenses, extent, duration and probability of potential impats and risks associated with the alternatives	Heading 7
(vii) positive and negative impacts that the proposed activity and alternatives will have on the environment and on the community that may be affected;	Heading 5 Heading 7
(viii) the possible mitigation measures that could be applied and level of residual risk;	Appendix 4 Heading 7
(ix) the outcome of the site selection matrix;	Heading 7 Tables
(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	Heading 9
(i) a Plan Of Study for undertaking the environmental impact assessment, including:	Heading 8

(i) a description of the alternatives to be considered and assessed wihtin the preferred site, including the option of not proceeding with the activity;	Heading 8.1
(ii) a description of the aspects to be assessed as part of the environmental impact assessment process;	Heading 8.1
(iii) aspects to be assessed by specialists;	Heading 8.1.4
(iv) a description of the proposed method of assessing the environmental aspects including a description of the proposed method of assessing alternatives including alternatives to be assessed by specialists;	Heading 8.1.4
(v) a description of the proposed method of assessing significance;	
(vi) an indication of the stages at which the competent authority will be consulted;	Heading 8.1.5
(vii) particulars of the public participation process that will be conducted during the environmental impact assessment process; and	Heading 8.1.4
(viii) a description of the tasks that will be undertaken as part of the environmental impact assessment process;	
(ix) identify suitable measures to avoid, reverse, mitigate or manage identified ipacts and to determine the extent of the residual risks that need to be managed and monitored.	Heading 8
(j) an undertaking under oath or affirmation by the EAP in relation to (i) the correctness of the information provided in the report (ii) the inclusion of comments and inputs from the stakeholders and I&APs and (iii) 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.	Appendix 6.1 Declaration of EAP & See Specialist PPP report Appendix 4.1
(k) An undertaking under oath of affirmation by the EAP in relation to the level of agreement between the EAP and I&APs on the plan of study for undertaking the environmental impact assessment	Appendix 6
l) where applicable, any specific information required by the competent authority	N/A
(m) any other matter required in terms of section 24(4) (a) and (b) of the Act.	N/A

1 INTRODUCTION

1.1 Project Background

Envirolution Consulting (Pty) Ltd was appointed by Eskom Holdings SOC Limited to conduct the Environmental Impact Assessment (EIA) Process for the proposed construction of the Blanco (Narina) to Droërivier 400kV Power line and for the upgrade of the Droërivier substation. The development entails the construction of a 200km long 400kV Transmission power line from the Blanco (Narina) Substation at George to the Droërivier Substation at Beaufort West, in the Western Cape Province. The alternative routes that are investigated (Alternative 2 and a deviation thereof, named Alternative 3) are also located in the Western Cape Province. Eskom Holdings SOC Ltd has appointed Envirolution Consulting (Pty) Ltd to undertake the EIA process for both this study, and another project – a 400kV Transmission Power line between the Blanco Substation and the Droërivier Substation at Beaufort west, through two separate projects that will be conducted at the same time.

In terms of the NEMA EIA Regulations (2014), published in Government Notice R. 982 in Government Gazette No. 38282 of 4 December 2014, under Section 24(5) of the National Environmental Management Act, 1998 (Act No.107 of 1998), a Scoping & Environmental Impact Assessments are required for the development due to the following listed activities:

- Development of infrastructure for transmission and distribution of electricity (with a capacity of 275kV or more outside an urban area) - Listing 2 (9),
- Development of a road wider than 4 meters but less than 13,5 meters - Listing 3 (4),
- clearance of an area of 300 sqm or more of indigenous vegetation except - Listing 3 (12)
- development of masts or towers for telecommunication or radio transmission - Listing 3 (3)
- Expansion of infrastructure within a certain geographical area based on environmental attributes, Listing 4 (2).

The National Department Environment Affairs (DEA) will be the relevant decision-making authority as Eskom is a parastatal. The EIA authorisations need to be granted by the DEA for approval and setting of conditions prior to commencement of any construction activities.

The development also triggers activities that require a Water Use License because it crosses several water courses. Therefore, before construction activities may take place, the activity will require a Water Use License as per requirement in the National Water Act (Act No.36 of 1998) (NWA) under Section 21(c) and (i) Water Uses. In terms of the NWA, this development requires a Water Use License as per the following regulations:

- Section 21(c) impeding or diverting the flow of water in a watercourse and;
- Section 21 (i) altering the bed, banks, course or characteristics of a watercourse.

The proposed projects are subject to the requirements of the Environmental Impact Assessment Regulations (2014 EIA Regulations) in terms of the National Environmental Management Act (NEMA, Act 107 of 1998, as amended). The Act makes provision for the identification and assessment of activities that are potentially detrimental to the environment and which require authorisation from the competent authority (in this case, the national Department of Environmental Affairs, DEA) based on the findings of an EIA.

The application is subject to Scoping and Environmental Impact Reporting. A Scoping and Environmental Impact Assessment Report (EIR) must be completed for the proposed project

and the information from the EIR must then be presented to the authorities for decision-making. The applications for authorisation were handed in along with the Draft Scoping Report.

The EIA will be undertaken using the following phased approach as required by the Department of Environmental Affairs (DEA):

- **Phase 1**: Project Initiation: authority consultation, site visits, the initiation of the environmental process and public participation;
- **Phase 2**: Compilation of the Scoping Report, identification of the specialist studies, and compilation of Plan of Study of Environmental Impact Report (EIR);
- **Phase 3**: The compilation of the EIR and the draft Environmental Management Programme (EMPr); and
- **Phase 4**: The compilation of the site specific EMPr.

1.2 Regulations (2014) guiding the Environmental Scoping Process

The 2014 EIA Regulations stipulate time frames for the submission and consideration of a Scoping Report, which applies as follows to this project:

Submission of scoping report to competent authority

21. (1) *within 44 days of receipt of the application* by DEA, Envirolution (on behalf of Eskom who is the applicant) must submit to DEA a Scoping Report which has been subjected to a public participation process of at least *30 days* and which reflects the incorporation of comments received, including any comments of the competent authority.

Consideration of scoping report

22. *Within 43 days of receipt* of a scoping report DEA must

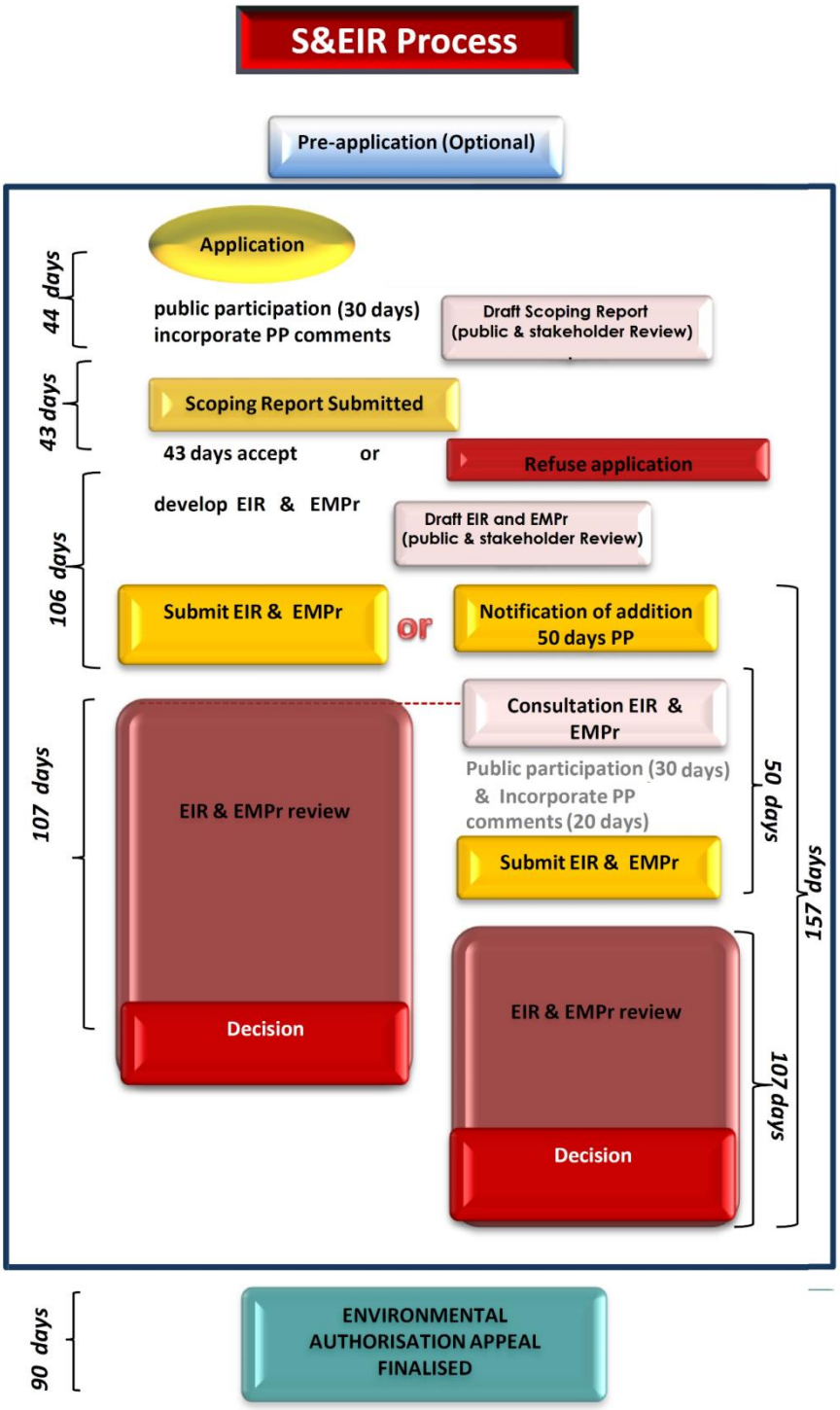
(a) accept the scoping report, with or without conditions, and advise Envirolution to proceed or continue with the tasks contemplated in the plan of study for EIA; or

(b) refuse environmental authorisation if the proposed activity is in conflict with a prohibition contained in legislation

23. (1) *Within 106 days of the acceptance of the scoping report*, Envirolution must submit to the competent authority-

(a) an EIA report inclusive of any specialist reports, and an EMPr, which must have been subjected to a public participation process of at least 30 days

(or a notification in writing that the EIA report inclusive of any specialist reports, and an EMPr, will be submitted within 156 days of acceptance of the scoping report by DEA, as significant changes have been made or significant new information has been added to the environmental impact report or EMPr, which changes or information was not contained in the reports consulted on during the initial public participation process contemplated in subregulation (1)(a), and that the revised environmental impact report or EMPr will be subjected to another public participation process of at least 30 days).



1.3 Objectives of the Environmental Scoping Report

The objective of a Scoping Report is to present an overview of the proposed activity and associated issues that require assessment in the EIA Phase. The EIA process typically comprises two phases, a Scoping Phase and an EIA phase. The Scoping Phase seeks to:

- Engage all Interested and Affected Parties (I&APs) through the advertisement and notification of the project;
- Communicate general and preliminary specialist information regarding the proposed project to all I&APs and other stakeholders in such a manner that it is easily understandable;
- Describe the key project issues and alternatives identified by the proponent, consultants, authorities and the public, which will require more detailed investigations in the EIA phase; and
- Provide the proposed approach to the EIA phase indicating the terms of reference for any specialist studies.
- Elimination of impacts that are of little or no significance in order to direct resources at evaluating and mitigating identified significant impacts.
- The report seeks to identify the best option available to the proponent by means of quantifying the various inputs received from stakeholders, Interested and affected parties, specialists and the experience of the EAP

1.4 Project Team

1.4.1 Project Applicant

Name:	**Eskom Holdings SOC Ltd**
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1.4.2 Environmental Assessment Practitioner

Company Name:	Envirolution Consulting (Pty) Ltd
Name:	Sheila Bolingo
Physical Address:	Vista Place, Suite 1a & 2, No 52, Cnr Vorster Avenue & Glen Avenue, Glenanda
Postal Address:	PO Box 1898, Sunninghill, 2157
Telephone Number:	(0861) 44 44 99
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E-mail:	sheila@envirolution.co.za

1.4.3 Expertise of the EAP to carry out Scoping procedures

- Sheila Muniongo, the principle author of this Basic Assessment holds an Honours Bachelor degree in Environmental Management and 5 years of experience in the consulting field. Her key focus areas are on strategic environmental assessment and advice on environmental impact assessments; public participation;

environmental management programmes, and mapping through ArcGIS for variety of environmental projects. She is currently involved in several diverse projects across the country.

- Gesan Govender, the project manager and Environmental Assessment Practitioner (EAP) responsible for this project, is a registered Professional Natural Scientist and holds an Honours degree in Botany. He has over 15 years of experience within the field of environmental management. His key focus is on strategic environmental assessment and advice; management and co-ordination of environmental projects, which includes integration of environmental studies and environmental processes into larger engineering-based projects and ensuring compliance to legislation and guidelines; compliance reporting; the identification of environmental management solutions and mitigation/risk minimising measures; and strategy and guideline development. He is currently responsible for the project management of EIA's for several diverse projects across the country.

1.4.4 Specialists

The specialists that undertook the relevant specialist studies are presented below.

Table 1. Project Specialists

Discipline	Organisation	Contact Person & Details
Public Participation & Facilitation	3E Consulting Report Appendix 4.1	**Samuel M Scott** Mobile: +27 (0)835862906 sam.scott@vodamail.co.za
Avifauna Assessment	Rodney Crisford *Knysna* Report Appendix 4.2	**Rodney Crisford** 044 382 2477 082 552 7187 ancientways@absamail.co.za
Botanical Assessment	Regalis Environmental Services *Oudtshoorn* Report Appendix 4.3	**Jan Vlok** Tel: 044-279 1987 Fax: 044-279 2185 janvlok@ mweb.co.za
Economic & Tourism Assessment	Economic Modelling Solutions (EMS) Report Appendix 4.4	**Dr Johannes Jordaan** johannes.jordaan@economicmodelling.co.za +27 82 320 9996 (mobile) +27 86 552 1942 (fax)
Heritage Assessment (Archaeology, Cultural & Palaeontology)	ACO Associates Naturaviva Report Appendix 4.5	**Dr Lita Webley** Tel: 021 706 4104 lita.webley@aco-associates.com **John Almond** & **Dr Wendy Taylor** 021 462 3622 naturaviva@universe.co.za
Fauna (Vertebrates)	EOH Coastal and Environmental Services Report Appendix 6	**Craig Sholto-Douglas** Tel 046 622 2364
Land Use/Regional & Town Planning	Envirolution Consulting Report Appendix 4.7	**Marinda le Roux** Envirolution marinda@envirolution.co.za 0614174281
Agricultural Assessment	ARC-Institute for Soil, Climate and Water Report Appendix 4.8	**Dr Garry Paterson** 012 310 2601 (w); 083 556 2458 (cell) garry@arc.agric.za
Social Impact	Amina Ismail Report Appendix 4.9	**Amina Ismail** 082 452 9799 solanum@worldonline.co.za
Visual Impact	i-scape Report Appendix 4.10	**Mr. Mader van den Berg** Cell: 076 169 1435 Fax: 086 520 4677 i-scape@vodamail.co.za
Wetlands & River Systems	Blue Science Report Appendix 4.11	**Dana Grobler** Tel: +27 (0)21 851 0555 Fax: +27 (0)86 620 181 dana@bluescience.co.za

1.5.5 Authority

Name:	Department of Environmental Affairs
Contact Person:	Toinette van der Merwe
Physical Address:	Fedsure Building, 315 Pretorius Street, Pretoria
Postal Address:	P O Box X447, Pretoria, 0002
Telephone Number:	(012) 399 8630
Fax Number:	(012) 320 7539
E-mail:	tvandermerwe@environment.gov.za

2. PROJECT DESCRIPTION

2.1 Project locality

The study area falls within the boundaries of the Eden District Municipality, in the Western Cape Province. Refer to Figure 1 for an overview of the study area.

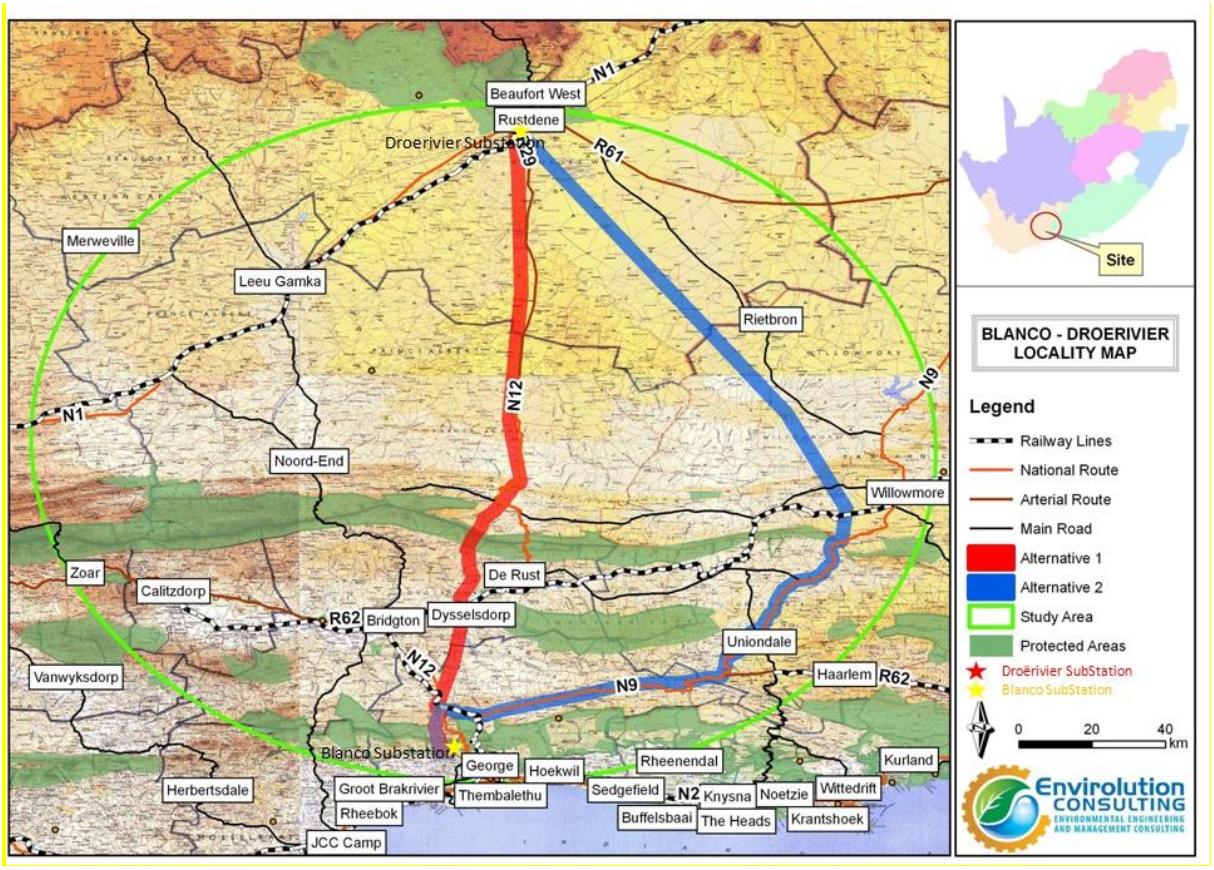


Figure 1. Study Area *(Please refer to A3 size maps in Appendix A)*

A Preferred Alternative 1 (red route) and an Alternative 2 route (blue route) have been proposed for the 400 kV transmission line between Gourikwa and Blanco, and a deviation of Alternative 2, namely Alternative 3 (the green route as shown on the Maps). Three alternative alignments are proposed within a corridor of 2 km, as indicated in Figure 1.

Alternative 1:

Alternative 1 (Red) is estimated at about 178 km and is a relative straight line connection (shortest route) between Blanco and Droërivier. The line passes about 16.8km east of Oudtshoorn and crosses over the Groot Swartberg Nature Reserve approximately 14km north-west of De Rust (the nature reserve is stretching over the Swartberg for over 200 km). It loosely runs in a corridor west of the N12 towards the Droërivier substation.

Alternative 2:

Alternative 2 (blue corridor) is 270 km long. It will exit the Blanco (Narina) substation and at the intersection of the N9 and N12, the proposed corridor will turn east and follow the N9/R62,

running very close to the western side of Uniondale. It will cross the R339 and the R407, and run 14 km to the west of Willowmore and 8 km to the west of Rietbron. This small section of the line falls within the Eastern Cape Province. The section of lands between the R407 and the Droërivier substation appears to be untransformed Karoo veld.

The reason for choosing the Alternative 2, was to avoid traversing the Groot Swartberg Nature Reserve. **The main reason for choosing Alternative 1 as the preferred alternative was due to the shorter distance** (178km versus 270km), which would result in economic savings, e.g in material, time and labour. It was estimated that approximately 300 additional tower structures would be required for the additional length.

Site alternatives for the Droërivier Substation cannot be assessed since the substation already exists and infrastructure will only be upgraded to accommodate the additional line connection. The Narina Substation site has received Environmental Authorisation on 1 September 2016.

2.2 Project Motivation

To motivate the project to construct a 400kV Transmission Power Line between Blanco (new Nerina) Substation and Droërivier Substation, the broader picture needs to be given. When all three options were technically evaluated, the line into Droërivier Substation via Blanco (Narina) Substation was preferred based on the natural path for the power to flow. This can be attributed to the future generation in the Cape Peninsula and surrounding area. This option is also in alignment with the proposed second Droërivier – Proteus 400 kV line as per the Technical Development Plan. For the Gourikwa-Blanco option, a 400 kV Transmission line from Gourikwa to Blanco (which is the next closest load centre) will have to be established.

Servitudes for the Transmission lines will need to be acquired. This EIA is being undertaken to assess the impact of the introduction of the Transmission lines between George and Beaufort West. Impacts associated with the physical infrastructure of the power line and its 55m servitude (27.5m on either side of the centre of the line) will be assessed for the study. In addition, impacts associated with a distance of 1 km alongside each side of the line will also be assessed.

If the project is authorised and routes secured, it is expected that the construction phase of the project will be over a period of up to 2 years, subject to confirmation by Eskom. The operations phase is expected be for a period of 40 to 50 years.

The graph below depicts the network of Eskom's existing and planned Transmission Power Lines, Substations and Power Stations for the southern region, and shows where this proposed 400kV Transmission Power line fits into overall planning.

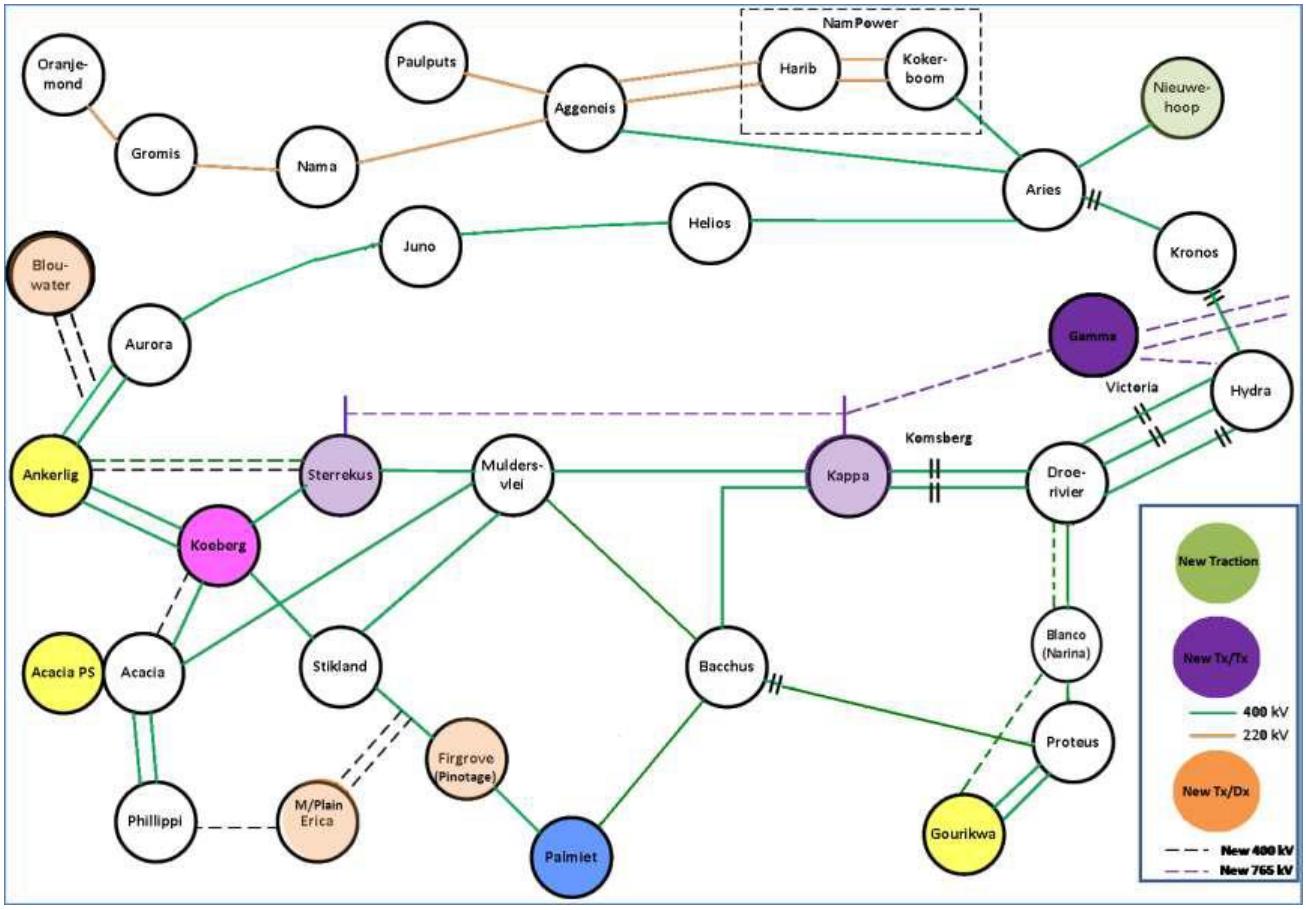


Figure 2. Transmission System Planned and Existing

2.2.1 Need and Desirability

Eskom Holdings is the biggest producer of electricity in South Africa; it also transmits electricity via a transmission network which supplies electricity at high voltages to a number of key customers and distributors. Eskom is a vertically integrated company licensed to generate, transmit and distribute electricity. The transmission licence is held by Eskom Transmission, the transmission network service provider (TNSP). Planning the transmission network is the responsibility of the Grid Planning Department in the Transmission Division.

According to the Eskom Transmission Ten Year Development Plan 2011-2021 (TDP), the 400kV transmission lines are a result of the development of a more meshed transmission 400kV network to provide greater reliability and thus improve the levels of national network security. These new transmission lines form part of the long-term strategy to develop a main transmission backbone from which regional power corridors can be supported.

The proposed 400kV transmission power line from the Blanco (Narina) Substation to Droërivier Substation forms part of the power corridors that will connect generation pools to one another and to the major load centres in the country. This backbone and regional power corridor network structure will allow the increasing system demand to be supplied and the power from new power stations to be integrated more efficiently

into the transmission network and distributed where required, both under system-healthy and system-contingency conditions.

The development of the transmission backbone and the associated regional power corridors were reviewed as part of the Strategic Grid Study which considered the potential development scenarios beyond the 10-year horizon of the Transmission Development Plan (TDP) until 2030. The objective of this strategic study was to align the transmission network with the requirements of the generation future options and those of the growing and future load centres. This Strategic Grid Study has enabled the 10-Year TDP to be aligned with the future long-term development of the whole Eskom system.

A Customer Load Network (CLN) is a network within a specific geographical area, which in turn is a subdivision of a Grid. The West Grid consists of four Customer Load Networks, namely Peninsula, Southern Cape, West Coast and Namaqualand. The proposed 400kV Transmission power line from the Blanco Substation to the Droërivier Substation forms part of Eskom's West Grid and the Southern Cape CLN. The current transmission network and CLNs are shown in the figure below:

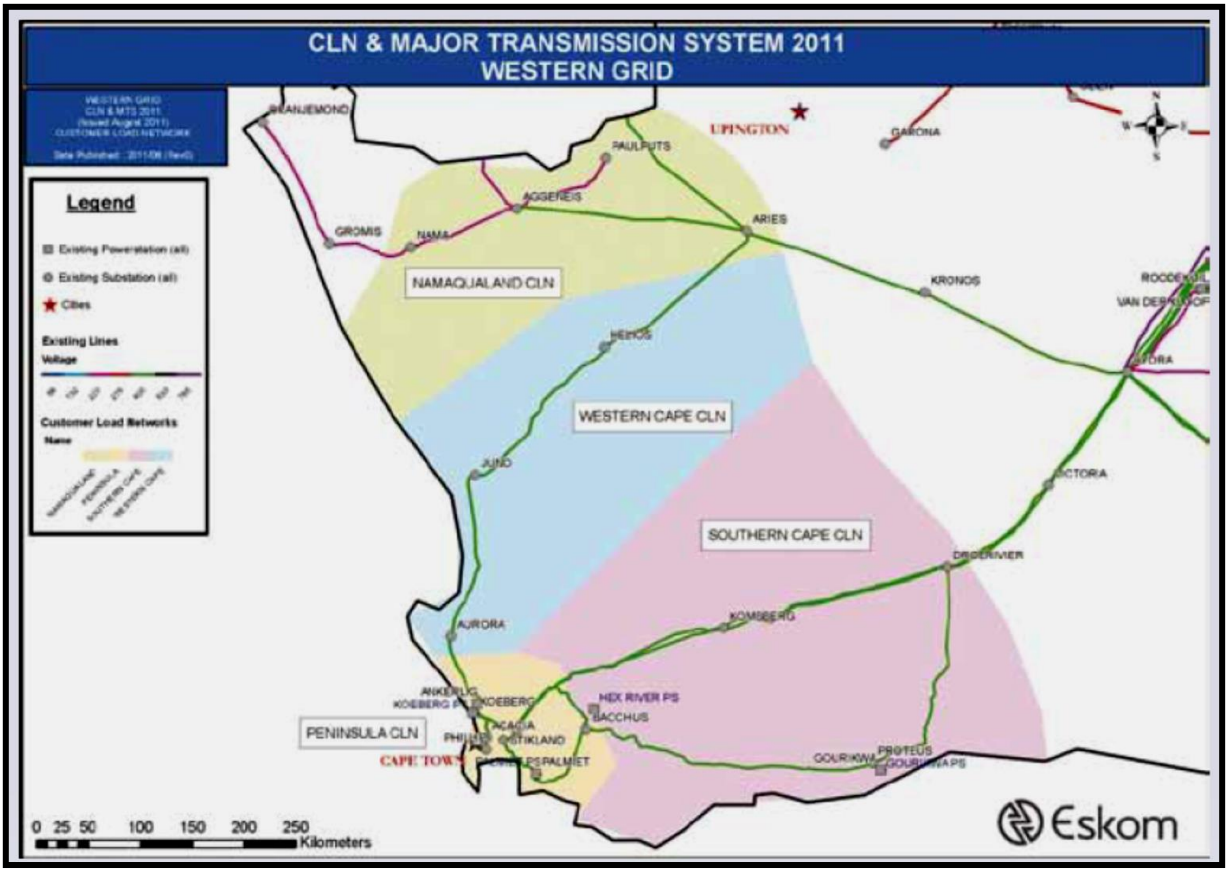


Figure 3. CNL and major Transmission System Western Grid (2011)

Local benefits of the proposed development include benefits to the local economy through possible job creation in the construction phase as well as during the operational phase of the

development. The construction for the proposed power line is estimated to last for approximately two years.

The project qualifies as a Strategic Infrastructure Project (SIP 10), namely "Electricity transmission and distribution for all". The project serves to "expand the transmission and distribution network to address historical imbalances, provide access to electricity for all and support economic development. Align the 10-year transmission plan, the services backlog, the national broadband roll-out and the freight rail line development to leverage off regulatory approvals, supply chain and project development capacity".

2.3 Description of Alternatives

2.3.1 No-go

The No-go option implies that the Project does not proceed, and Eskom does not go ahead with the construction of the 400 kV power line or the upgrade of the existing substation in Droërivier.

2.3.2 Alternatives for 400 kV servitude

Including the Preferred Option, a second route deviation or alignment has been proposed for the 400 kV transmission power line servitude. This option will be further assessed during the EIA phase and recommendations from the investigations are likely to inform a decision on the alternative with the least possible impacts. A Corridor of 2 km in width will be assessed for each alternative.

The table below compares the aspects of the different Alternatives:

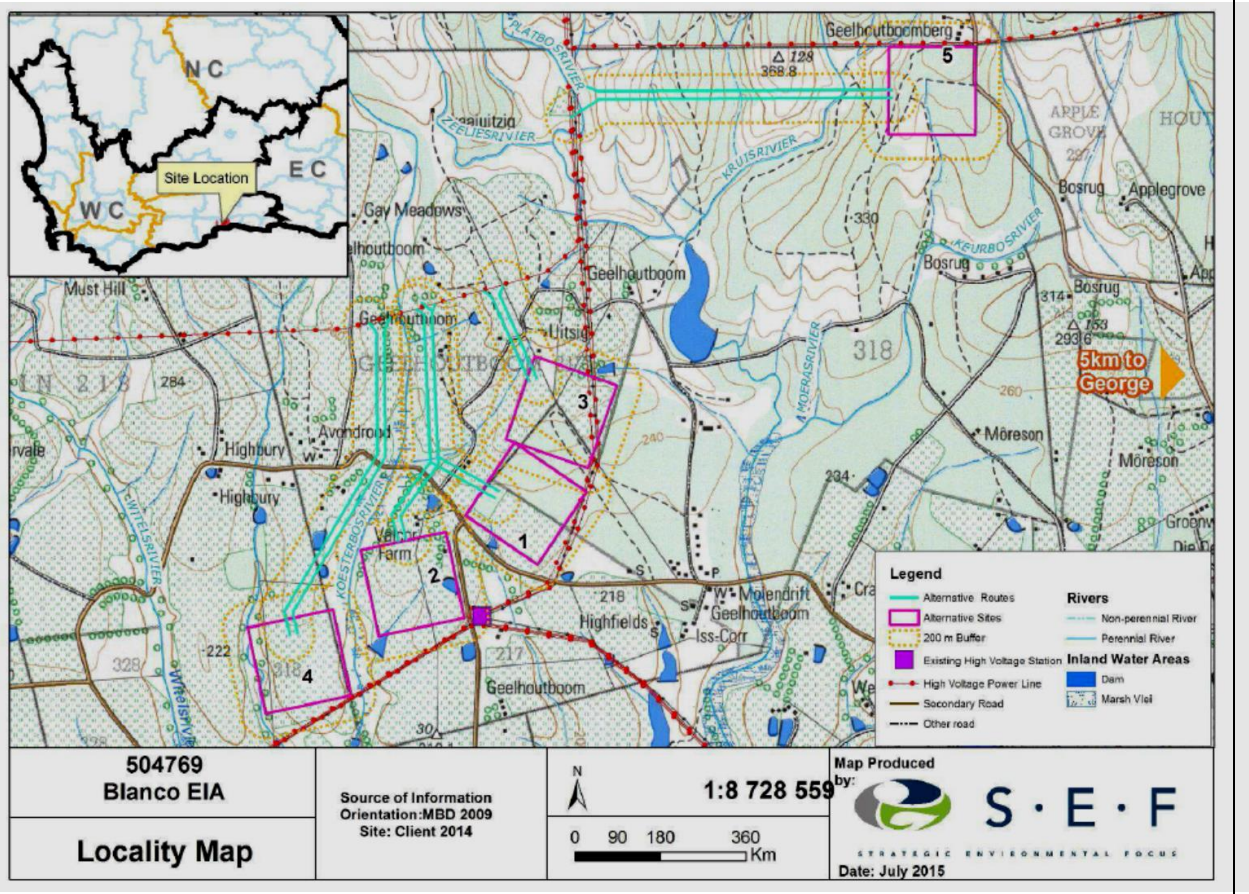
Characteristics	Alternative 1 (preferred)	Alternative 2
Length	178km	270km
No of Bends	45	46
Access	Fair	Fair
Tx Line Crossings	2	2
Dx HV Line Crossings	3	3
Rail Crossings	2	1
National Road Crossings	3	5
Regional road Crossings	1	4
Land Use	Agricultural lands, Grazing lands and game farming	Agricultural lands, Grazing lands and game farming
Topography	Undulating	Undulating

2.3.3 Blanco (Narina) Substation

Blanco Transmission Substation has not yet been built. It is currently proposed to be situated 60kM North-Eastern side of Gourikwa substation. The EIA for this substation is still in process and is anticipated to be concluded in the middle of 2015. The application for the Substation does not form part of this EIA. Five alternative sites are under investigation. The construction of the Blanco Narina Transmission

Substation falls **outside the scope of this project**, and have been applied for in a separate EIA, in which SEFSA investigated the following alternatives:

1. Alternative substation site 1 on the north eastern side of the existing 132kV Blanco substation, across the existing gravel road – Geelhoutboom road. The site is located on agricultural land and is the preferred option for the construction of the new substation in terms of the site's proximity to the existing Blanco substation and the grid network (easy integration into the existing network).
2. Alternative substation site 2 is located immediately North West of the existing 132kV Blanco substation, and South West of Alternative 1.
3. Alternative substation site 3 is located north of alternative 1 and Geelhoutboom Road, and approximately 1.5km north east of the existing Blanco Distribution Substation.
4. Alternative substation site 4 is located approximately 1.2km south west of the existing Blanco substation.
5. Alternative substation site 5 is located in the foothills of the Outeniqua Mountains, approximately 4.5km north east of the existing Blanco Distribution Substation.



2.3.4 Droërivier Substation

The expansion of the Droërivier site will require that all new infrastructure is in the immediate vicinity of the existing substation. The expansion of the existing substation will be constrained by features such as a watercourse on the northern and north-eastern side. A railway line is located on the western side of the substation. The existing power lines and towers are located to east.

Figure 4. Droërivier Substation

2.4 Description of the proposed activities

2.4.1 Infrastructural description

The two route alignment alternatives should require similar tower designs, with the same technical specifications. The specialist studies during the EIA process will determine which route is the preferred route, after which details regarding the number, tower design and other support infrastructures associated with the power line will be finalised._Based on similar projects, it is anticipated that the following types of towers may be used on this project:

- Cross rope suspension tower;
- Compact cross rope suspension tower;
- Guyed-V suspension tower;
- Self-supporting suspension tower;
- Self-supporting strain tower; or
- Guyed strain structures.

The design of the pylons/towers will be as per the "generic diagram". Examples of typical 400 kV transmission pylons are shown in **Appendix 5**.

2.4.2 Servitude Requirements

A servitude of 55m is required for a single 400kV power line. A separation distance will be required between the 400kV and other lines, since two of the proposed routes will run parallel to existing power lines for a short distance. **For this project, a servitude of 55m has been proposed.** Power line servitudes are occasionally secured along existing servitudes such as roads and pipelines. In cases where the servitude is required next to a road reserve, a distance up to 95m from the centre of road to edge of power line servitude may be required. The land beneath the overhead lines can be continued to be used, as normal, by the landowners. Eskom, however, require that no dwellings or vegetation/crops higher than 4 m be established within the servitude. SPLUMA, the National Spatial Planning Land Use Management Act, has come into being since September 2015. The establishment and zoning requirements for the Sub-stations must be considered by the Proponent and the necessary Service Providers appointed in order for the process to be completed, prior to commencement of construction, as most of the property on which sub-stations of this magnitude are built is still zoned as agriculture.

2.4.3 Clearance Requirements

It is anticipated that a 6m strip will be cleared to facilitate access and construction, except where tower erection and stringing requires more space. Eskom have their internal guidelines and standards for Bush Clearance and maintenance within Overhead Power line Servitudes. This document provides minimum clearances for overhead conductors that will need to be taken into account in the formulation of any power line development..

2.4.4 Required Services

During the EIA phase, all alternatives will be assessed and findings will be included in the Environmental Impact Assessment Report (EIR). In addition, the Environmental Management Programme (EMPr) will include a site walk down exercise that will guide the final location of proposed infrastructure.

i. Access Routes & Storm Water

Most areas along the three proposed routes are reasonably accessible and can be reached via the existing public and farm roads. During the site visits it was noted that some sections of the Preferred Option (Alternative 1, Red line) traverses Private Game Reserve areas, for which careful planning and mitigations will be crucial, should these areas not be avoided in totality. Temporary access routes will be required to construct the lines in areas where the pylons will be placed on private properties, such as farms and reserves. The details and permissions will be negotiated after the project has been approved.

Storm water will be managed according to the Eskom Guidelines for Erosion Control and Vegetation Management as well as the Environmental Management Programme (EMPr), which will be compiled for the construction phase.

ii. Construction Site Camps

The power line construction contractor would need to set up at least one site camp but this does not necessarily need to be near the power line route. The contractor may however prefer to use a fully serviced site at another location. The contractor will be encouraged to utilised already disturbed areas for construction camp purposes, in order to minimise cumulative impacts. It is likely that a number of construction camps would need to be established for the construction period.

iii. Sewage

A negligible sewage flow is anticipated for the duration of the construction period. Chemical toilets will be utilised during construction, and the contactor will ensure regular treatment of these facilities. The toilets will be serviced regularly, as specified by the final site specific EMPr.

iv. Solid Waste Disposal

All solid waste will be collected at a central location at each construction site and will be stored temporarily until removal to an appropriately permitted landfill site in the vicinity of the construction site.

v. Electricity

Construction team might have temporary connection and supply of electricity from the existing network. Diesel generators will be utilised as an option for the provision of electricity.

2.5 Eskom Project Procedure – Construction of Power Lines

Eskom uses the following procedure[1] for the construction of their new transmission lines.

2.5.1 Planning

The Transmission System Planning Department of Eskom are the system network planners which formulate five-year, ten-year or 20-year Transmission Development Plans (TDP), which are strategic documents aimed at identifying the entire infrastructure required throughout South Africa for the transmission of electricity.

All projects initiated by the Eskom planners have to be in line with the requirements stipulated in the TDP. All projects which are initiated are thoroughly investigated to ensure that they are both viable and feasible before being approved for implementation.

2.5.2 Appointment of EIA Practitioners

Once a project is internally approved to be investigated, the Eskom Land and Rights Department initiates the process of the Environmental Impact Assessment (EIA). In the case of the Blanco to Droërivier project, a Scoping and EIA Process will be followed by Envirolution Consulting (Pty) Ltd. The purpose of the EIA process is as follows:

- To identify both the positive and the negative impacts on the environment, communities and the local economy;
- To identify the impact on the proposed infrastructure;
- To recommend all possible mitigation measures for each impact identified; and
- To develop a plan for implementing the mitigating measures.

All the above information will be gathered and collated into a document called the Environmental Impact Report (EIR), which will be submitted to the decision making authority, the National Department of Environmental Affairs (DEA). The document will provide the DEA with all the alternative routes assessed during the EIA process and recommend the least impacting route for authorisation. If authorised, the DEA will issue an Environmental Authorisation, which will allow Eskom to implement the project. An Environmental Authorisation (EA) normally stipulates all conditions that should be adhered to before construction can commence. One such condition would be to draft an Environmental Management Programme (EMPr) for approval by DEA before construction can commence. During construction, an Environmental Compliance Officer (ECO) must be employed to ensure that the specifications of the EA and EMPr are adhered to.

[1] *Eskom Fact Sheet: Construction of power lines*

2.5.3 Land and rights acquisition

Once a positive uncontested Environmental Authorisation has been granted, the process of securing the servitude or title of the said portions of land will commence. To achieve this, the following activities have to be completed:

- The legal boundaries are identified for each property affected by the project;
- The legal ownership of each property is identified;
- An independent property evaluator is appointed to determine the market value of the affected properties; and
- Negotiations are conducted by Transmission negotiators with each legal landowner to acquire the rights to construct power lines over their properties. Rights are also acquired from affected statutory bodies and mineral right holders.

All land and rights acquired for the purpose of building power lines are registered at the Deeds Office as either title deeds for land or servitudes for rights.

2.5.4 Survey and line design

Topographical surveys are conducted subsequent to identifying and securing servitudes. The survey information is used by the design engineers to design the tower foundations, structures, buildings, and the exact placement of structures.

The EMPr will be finalised when all the profiles and local site plans are available. The EMPr will outline all activities that have to be undertaken, where they will take place, the responsible person, all possible environmental or social impacts, the mitigation measures, the rehabilitation plans, the monitoring methods, the frequency of monitoring and the performance indicators. The EMPr is a legally binding document which is used to ensure that Eskom adheres to all conditions of the Environmental Authorisation and EIR.

2.5.5 Construction

A procurement process is followed to identify a suitable construction contractor. During this process all potential contractors are invited to bid for the implementation of the project. Various factors are considered when appointing these contractors, among others capacity, legal status, adherence to all Eskom standards (ie safety, quality, and environment) and other legislated regulations, policies and procedures.

2.5.6 Rehabilitation & Maintenance

After the project has been completed, all affected properties are rehabilitated to their original status. Landowners sign off release forms to confirm the rehabilitated status.

Vegetation in servitudes needs to be kept under control to allow access and to prevent the spread of veld fires. This will be undertaken by experienced contractors and permission will be obtained from land owners where access is required over private property.

3. LEGISLATION AND GUIDELINES CONSIDERED

Appendix 2 of the 2014 Environmental Impact Assessment Regulations states that one of the purposes of the scoping report is to identify the relevant policies and legislation relevant to the activity. The scoping report must include a description of the policy and legislative context within which the development is proposed including an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks and instruments that are applicable to this activity and are to be considered in the assessment process. It has been determined that a Scoping & Environmental Impact Assessment Report (S&EIR) process must be completed in respect of activities listed in a notice issued by the Minister in terms of section 24D of the NEMA . Accordingly, Eskom has applied for Authorisation of the listed activities relevant to this project. The scope and content of the Scoping Report has been guided by the following legislation and guidelines.

3.1 Constitution of the Republic of South Africa, 1996

The Constitution of the Republic of South Africa, 1996 has major implications for environmental management. The main effects are the protection of environmental and property rights, the drastic change brought about by the sections dealing with administrative law such as access to information, just administrative action and broadening of the *locus standi* of litigants. These aspects provide general and overarching support and are of major significance in the effective implementation of the environmental management principles and structures of the Environment Conservation Act and NEMA. Section 24 in the Bill of Rights of the Constitution specifically states:

"Everyone has the right –

- *To an environment that is not harmful to their health or well-being; and*
- *To have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that -*
    - *Prevent pollution and ecological degradation;*
    - *Promote conservation; and*
    - *Secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development."*

Section 24 of the Constitution therefore places a duty on all spheres of government to take reasonable steps, including making laws, preventing pollution, promoting conservation and ensuring sustainable development. **Eskom is committed to abide by this requirement.**

3.2 National Environmental Management Act, 1998 (Act 107 of 1998 "NEMA").

The overarching environmental legislation for the management of the environment in South Africa is the National Environmental Management Act, 1998 (Act 107 of 1998) ("NEMA"). Its preamble states that sustainable development requires the integration of social, economic and environmental factors in the planning, implementation and evaluation of environmental decisions to ensure that development serves present and future generations. Important sections of NEMA include:

- Section 2: The NEMA principles
- Section 28 Duty Of Care

- Section 30 The Prevention of incidents and reporting should an incident occur

Chapter 5 of NEMA makes provisions for regulations to be formulated and published. In December 2014, new EIA Regulations were published, that are relevant to the EIA to this project:

Regulation Gazette No. 10328 Vol. 594 Pretoria, 4 December
R. 982: Environmnetal Impact Assessment Regulations (EIA Regulations)
R. 984.: EIA Regulations Listing notice 2
R. 985.: EIA Regulations Listing notice 3

The development triggers activities in terms of the National Environmental Management Act, Government Notices R982, R984 and R985. In terms of the 2014 NEMA EIA Regulations, Scoping & Environmental Impact Assessments are required for the servitude between Blanco to Droerivier (BD) due to the following listed activities:

Detailed description of listed activities associated with the project	
Listed activity as described in GN R 983, 984 and 985	**Description of project activity that triggers listed activity**
GR 983 Listing Notice 1 **(12):** The development of (xii) infrastructure or structures covering 50 square metres or more Where such construction occurs- (c) if no development setback line, within a watercourse or within 32 metres of a watercourse, measures from the edge of a watercourse,	The proposed power line pylons may impede upon watercourses or pylon structures situated within 32 metres of a watercourse.
GR 983 Listing Notice 1 **(19):** 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- i.) a watercourse	The power line may require the removal or infilling of material more than 5 cubic metres from a watercourse.
GR 983 Listing Notice 1 **(24):** The development of- ii) a road with a reserve wider than 13,5 meters, or where no reserve exists where the road is wider than 8 metres	The project entails the development of temporary access roads of approximately 6m wide to allow vehicles to access the areas of construction. These roads will be required in areas where the alignment will not follow the existing roads and servitudes where access will be possible without new roads.
GR 983 Listing Notice 1 **(47):** The expansion of facilities for the transmission and distribution of electricity where the expanded capacity will exceed 275 kilovolts and the development footprint will increase.	Additional 400kV feeder bays will be required at the Droerivier Substation
GR 984 Listing Notice 2 **(9):** The development of facilities or infrastructure for the	The project entails that transmission power lines of 400kV will be erected outside towns in the Western Cape (Alternative 2 runs partly through the Eastern Cape).

transmission and distribution of **electricity with a capacity of 275kV or more**, outside an urban area or industrial complex	
GR 984 Listing Notice 2 **(15):** The clearance of an area of 20 hectares or more of indigenous vegetation	The clearing of more than 20 hectares of indigenous vegetation may be undertaken during construction of the power line.
GR 985 Listing Notice 3 ***(3):*** The development of masts or towers of any material or type used for telecommunication broadcasting or radio transmission purposes where the mast or tower- (a) is to be placed on a site not previously used for this purpose; and (b) will exceed 15 metres in height . (b) **In Eastern Cape:** i. In an estuarine functional zone; *ii. Outside urban areas,* (aa) A protected area identified in terms of NEMPAA, excluding conservancies; (bb) National Protected Area Expansion Strategy Focus areas; (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; (dd) Sites or areas identified in terms of an International Convention; (ee) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans; (ff) Core areas in biosphere reserves; (gg) Areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any other protected area identified in terms of NEMPAA or from the core areas of a biosphere reserve; or (hh) Areas seawards of the development setback line or within 1 kilometre from the high-water mark of the sea if no such development setback line is determined; or *iii. Inside urban areas; in:* (aa) Areas zoned for use as public open space; or (bb) Areas designated for conservation use in Spatial Development Frameworks adopted by the competent authority or zoned for a conservation purpose. (**f) In Western Cape:** i. All areas outside urban areas; or ii. Areas designated for conservation use in Spatial Development Frameworks adopted by the competent authority, or zoned for a conservation purpose, within urban areas.	At the Substations (Blanco), masts taller than 15m will be erected for the purpose of a lightning protection system (LPS). The external LPS (mast) is intended to: 1. intercept a lightning flash to the structure 2. conduct the lightning current safely towards earth (using a down-conductor system), 3. disperse the lightning current into the earth (using an earth-termination system *In some instances, Telecommunication infrastructure will need to be installed on pylons, which could be higher than 15m from ground level.*
GR 985 Listing Notice 3 (**4):** The development of a **road wider than 4 meters** with	The project entails the development of temporary access roads of approximately 6m wide to allow vehicles to access the areas of construction. These roads will be required in areas where the

a reserve less than 13, 5 meters. **(b) In Eastern Cape** (ii)Outside urban areas, (ee) Critical biodiversity areas as identified in systematic biodiversity plans adopted by competent authority or in bioregional plans, (gg) areas within 10km from national parks or 5km from any other protected area identified in terms of NEMPAA or from the core areas of a biosphere reserve **(f)In Western Cape** i. Areas outside urban areas; (aa)Areas containing indigenous vegetation ii. Areas in urban areas; (cc) areas zoned for conservation use (dd) Areas designated for conservation use in Spatial Development Frameworks adopted by the competent authority	alignment will not follow the existing roads and servitudes where access will be possible without new roads. *Areas of the Swartberg are part of a UNESCO World Heritage Site.*
GR 985 Listing Notice 3 **(12)**: The **clearance of an area of 300 sqm or more of indigenous vegetation** except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management (a) In Eastern Cape and Western Cape provinces: i. Within any critically endangered or endangered where such clearance of ecosystem listed in terms of section 52 of the NEMBA or indigenous vegetation is prior to the publication of such a list, within an area that is required for maintenance has been identified as critically endangered in the purposes undertaken in National Spatial Biodiversity Assessment 2004; ii. Within critical biodiversity areas identified in bioregional management plan. iii. Within the littoral active zone or 100 metres inland from high water mark of the sea or an estuarine functional zone, whichever distance is the greater, excluding where such removal will occur behind the development setback line on erven in urban areas; or iv. On land, where, at the time of the coming into effect of this Notice or thereafter such land was zoned open space, conservation or had an equivalent zoning.	The project will require the clearance of more than 300 sqm of indigenous vegetation between George and Beaufort West. Sections of the lines will be located in areas of Fynbos or Rhenosterveld vegetation on land that is zoned open space or used for agricultural purposes. Private Game farms are located on the corridors that are proposed for the infrastructure, where conservation is practised. For the placement of towers and access roads, it will be required that areas of more than 300 sqm of indigenous vegetation will have to be cleared, mostly in the Western Cape (and the Eastern Cape for Alt 2)
GR 985 Listing Notice 3 (**14):** The development of: (xii) infrastructure or structures with a physical footprint of 10 square metres or more. within a watercourse; **(b) In Eastern Cape** (ii)Outside urban areas, (ee) Critical biodiversity areas as identified in systematic biodiversity plans adopted by competent authority or in bioregional plans, (gg) areas within 10km from national parks or 5km from	There is drainage lines on the proposed study are which will be impacted by the proposed infrastructures within an area defined as a CBA.

any other protected area identified in terms of NEMPAA or from the core areas of a biosphere reserve **(f)In Western Cape** iii. Areas outside urban areas; (aa)Areas containing indigenous vegetation iv. Areas in urban areas; (cc) areas zoned for conservation use (dd) Areas designated for conservation use in Spatial Development Frameworks adopted by the competent authority	

3.3 National Water Act (Act No.36 of 1998) (NWA) under Section 21 Water Uses

The development also triggers activities that require a Water Use License (WUL) because it crosses several water courses. Therefore, before construction activities may take place, the activity will require a Water Use License as per requirement in the National Water Act (Act No.36 of 1998) (NWA) under Section 21 Water Uses. In terms of the NWA, this development requires a Water Use License for the following water uses:

- Section 21(c) impeding or diverting the flow of water in a watercourse and;
- Section 21 (i) altering the bed, banks, course or characteristics of a watercourse.

The purpose of the EIA Regulations is "*to regulate the procedures and criteria as contemplated in Chapter 5 of the National Environmental Management Act relating to the submission, processing and consideration of, and decision on applications for environmental authorisation for the commencement of activities in order to avoid detrimental impacts on the environment, or where it cannot be avoided, ensure mitigation and management of impacts to acceptable levels, and to optimise positive environmental impacts, and for matters pertaining thereto*".

3.4 The National Environmental Management: Air Quality Act 39 of 2004

The National Environmental Management: Air Quality Act 39 of 2004 provides for the setting of national norms and standards for regulating air quality monitoring, management and control and describes specific air quality measures so as to protect the environment and human health or well-being by: preventing pollution and ecological degradation; and promoting sustainable development through reasonable resource use. It also includes reference to the control of offensive odours whereby reasonable steps to prevent the emission of any offensive odours caused by activities on a premises are required. Other local legislation in this regard, include:

- Eden District Air Quality Management By-Law
  Published in Western Cape Provincial Gazette 7043 of 12 October 2012.

- George Local Municipality Air Pollution Control By-Law
  Published under PN 439 in Western Cape Provincial Gazette 6816 of 30 November 2010.

- MOSSEL BAY LOCAL MUNICIPALITY AIR QUALITY CONTROL BY-LAW

3.5 Electricity Regulation Act 4 of 2006

This Act governs the control of generation and supply of electricity in South Africa and the existence and functions of the National Energy Regulator. The Act aims to establish a national regulatory framework for the electricity supply industry; to make the National Energy Regulator the custodian and enforcer of the national electricity regulatory framework; to provide for licences and registration as the manner in which generation, transmission, distribution, trading and the import and export of electricity are regulated; and to provide for matters connected therewith.

3.6 The Conservation of Agricultural Resources Act 43 of 1983

The Act provides for control over the utilization of the natural agricultural resources of the Republic in order to promote the conservation of the soil, the water sources and the vegetation and the combating of weeds and invader plants; and for matters connected therewith. Since the alternative routes will cross streams and will be located in the vicinity of water courses, impacts such as soil erosion, alien plants, flooding and pollution must be avoided by all means.

3.7 National Water Act 36 of 1998

The National Water Act aims to manage the national water resources to achieve sustainable use of water for the benefit of all water users. The purpose of the Act is to ensure that the nation's water resources are protected, used, developed, conserved, and managed in ways, which take into account:

- Meeting the basic human needs of present and future generations;
- Promoting equitable access to water;
- Redressing the results of past racial discrimination;
- Promoting the efficient, sustainable and beneficial use of water in the public interest;
- Facilitating social and economic development;
- Providing for the growing demand for water use;
- Protecting aquatic and associated ecosystems and their biological diversity;
- Reducing and preventing pollution and degradation of water resources;
- Meeting international obligations;
- Promoting dam safety; and
- Managing floods and droughts.

Section 19 of the National Water Act addresses water pollution during construction:

(1) An owner of land, a person in control of land or a person who occupies or uses the land on which -

(a) any activity or process is or was performed or undertaken; or

(b) any other situation exists, which causes, has caused or is likely to cause pollution of a water resource, must take all reasonable measures to prevent any such pollution from occurring, continuing or recurring.

(2) The measures referred to in subsection (1) may include measures to -

(a) cease, modify or control any act or process causing the pollution;

(b) comply with any prescribed waste standard or management practice;
(c) contain or prevent the movement of pollutants;
(d) eliminate any source of the pollution;
(e) remedy the effects of the pollution; and
(f) remedy the effects of any disturbance to the bed and banks of a watercourse.

(3) A catchment management agency may direct any person who fails to take the measures required under subsection (1) to -

(a) commence taking specific measures before a given date;
(b) diligently continue with those measures; and
(c) complete them before a given date.

(4) Should a person fail to comply, or comply inadequately with a directive given under subsection (3), the catchment management agency may take the measures it considers necessary to remedy the situation.

(5) Subject to subsection (6), a catchment management agency may recover all costs incurred as a result of it acting under subsection (4) jointly and severally from the following persons:

(a) Any person who is or was responsible for, or who directly or indirectly contributed to, the pollution or the potential pollution;
(b) the owner of the land at the time when the pollution or the potential for pollution occurred, or that owner's successor-in-title;
(c) the person in control of the land or any person who has a right to use the land at the time when -
(i) the activity or the process is or was performed or undertaken; or
(ii) the situation came about; or
(d) any person who negligently failed to prevent -
(i) the activity or the process being performed or undertaken; or
(ii) the situation from coming about.

(6) The catchment management agency may in respect of the recovery of costs under subsection (5), claim from any other person who, in the opinion of the catchment management agency, benefitted from the measures undertaken under subsection (4), to the extent of such benefit.

(7) The costs claimed under subsection (5) must be reasonable and may include, without being limited to, labour, administrative and overhead costs.

(8) If more than one person is liable in terms of subsection (5), the catchment management agency must, at the request of any of those persons, and after giving the others an opportunity to be heard, apportion the liability, but such apportionment does not relieve any of them of their joint and several liability for the full amount of the costs.

Section 20 of the National Water Act addresses the reporting of incidents

20. (1) In this section ``incident'' includes any incident or accident in which a substance -

(a) pollutes or has the potential to pollute a water resource; or
(b) has, or is likely to have, a detrimental effect on a water resource.

(2) In this section, ``responsible person'' includes any person who -

(a) is responsible for the incident;
(b) owns the substance involved in the incident; or
(c) was in control of the substance involved in the incident at the time of the incident.

(3) The responsible person, any other person involved in the incident or any other person with knowledge of the incident must, as soon as reasonably practicable after obtaining knowledge of the incident, report to -

(a) the Department;

(b) the South African Police Service or the relevant fire department; or

(c) the relevant catchment management agency.

(4) A responsible person must -

(a) take all reasonable measures to contain and minimise the effects of the incident;

(b) undertake clean-up procedures;

(c) remedy the effects of the incident; and

(d) take such measures as the catchment management agency may either verbally or in writing direct within the time specified by such institution.

(5) A verbal directive must be confirmed in writing within 14 days, failing which it will be deemed to have been withdrawn.

(6) Should -

(a) the responsible person fail to comply, or inadequately comply with a directive; or

(b) it not be possible to give the directive to the responsible person timeously,the catchment management agency may take the measures it considers necessary to -

(i) contain and minimise the effects of the incident;

(ii) undertake clean-up procedures; and

(iii) remedy the effects of the incident.

(7) The catchment management agency may recover all reasonable costs incurred by it from every responsible person jointly and severally.

(8) The costs claimed under subsection (7) may include, without being limited to, labour, administration and overhead costs.

(9) If more than one person is liable in terms of subsection (7), the catchment management agency must, at the request of any of those persons, and after giving the others an opportunity to be heard, apportion the liability, but such apportionment does not relieve any of them of their joint and several liability for the full amount of the costs.

Section 21 of the National Water Act describes water uses as follows:

(a) taking water from a water resource,

(b) storing water,

(c) impeding or diverting the flow of water in a watercourse,

(d) engaging in a stream flow reduction activity contemplated in section 36,

(e) engaging in a controlled activity identified as such in section 37(1) or declared under section

38(1),

(f) discharging waste or water containing waste into a water resource through a pipe, canal, sewer, sea outfall or other conduit,

(g) disposing of waste in a manner which may detrimentally impact on a water resource,

(h) disposing in any manner of water which contains waste from, or which has been heated in, any industrial or power generation process,

(i) altering the bed, banks, course or characteristics of a watercourse,

(j) removing, discharging or disposing of water found underground if it is necessary for the efficient continuation of an activity or for the safety of people, and

(k) using water for recreational purposes.

Section 22 of the National Water Act prescribes permissible water uses.. Section 22 (2) further states that a person who uses water as contemplated in subsection (1):

(a) must use the water subject to any condition of the relevant authorisation for that use,
(b) is subject to any limitation, restriction or prohibition in terms of this Act or any other applicable law,
(c) in the case of the discharge or disposal of waste or water containing waste contemplated in section21(f), (g), (h) or (j), must comply with any applicable waste standards or management practices prescribed under section 26(1)(h) and (i), unless the conditions of the relevant authorisation provide otherwise,
(d) may not waste that water, and
(e) must return any seepage, run-off or water containing waste which emanates from that use, to the water resource from which the water was taken, unless the responsible authority directs otherwise or the relevant authorisation provides otherwise.

Section 41 of the National Water Act provides details on the procedure to follow for licence applications. Section 27 (1) prescribes the factors that should be considered by the Department of Water Affairs and Sanitation in the consideration of a licence application.

Since the alternative routes will cross streams and will be located in the vicinity of water courses, impacts such as soil erosion, alien plants, flooding and pollution must be avoided by all means.

In addition to the above, the Mossel Bay Local Municipality Ha A " Water Conservation Policy" that was Published in Western Cape Provincial Gazette 6788 of 10 September 2010 and amended by: PG 6836 (2011/01/14) and PG 6905 (2011/09/09 -entire text replaced with amended version).

3.8 National Heritage Resources Act 25 of 1999

The National Heritage Resources Act 25 of 1999 was introduced to ensure protection of South Africa's important heritage features. Section 38 of the Act requires that:

*any person who intends to undertake a development categorised as: **The construction of a road, wall, power line, pipeline, canal or other similar form of linear development or barrier exceeding 300m in length;** must at the very earliest stages of initiating such a development, notify the responsible heritage resources authority and furnish it with details regarding the location, nature and extent of the proposed development.*

The Heritage Specialists on the project team will ensure compliance with these requirements, and has submitted the Notice of Intent to Develop (NID) to Western Cape Heritage.

3.9 Waste Management Act 59 of 2008

Waste management is regulated by the National Environmental Management: Waste Act 59 of 2008 ("the Waste Act") with effect from 1 July 2009. The Waste Act defines waste as:

(a) any substance, material or object, that is unwanted, rejected, abandoned, discarded or disposed of, or that is intended or required to be discarded or disposed of, by the holder of that substance, material or object, whether or not such substance, material or object can be re-used, recycled or recovered and includes all wastes as defined in Schedule 3 to this Act; or

(b) any other substance, material or object that is not included in Schedule 3 that may be defined as a waste by the Minister by notice in the Gazette,but any waste or portion of waste, referred to in paragraphs (a) and (b), ceases to be a waste-

(i) once an application for its re-use, recycling or recovery has been approved or, after such approval, once it is, or has been re-used, recycled or recovered;

(ii) where approval is not required, once a waste is, or has been re-used, recycled or recovered;

(iii) where the Minister has, in terms of section 74, exempted any waste or a portion of waste generated by a particular process from the definition of waste; or

(iv) where the Minister has, in the prescribed manner, excluded any waste stream or a portion of a waste stream from the definition of waste.

Section 16 of the Waste Act states that the holder of waste must, within the holder's power, take all reasonable measures to:

(a) avoid the generation of waste and where such generation cannot be avoided to minimise the toxicity and amounts of waste that are generated;
(b) reduce, re-use, recycle and recover waste;
(c) where waste must be disposed of, ensure that the waste is treated and disposed of in an environmentally sound manner;
(d) manage the waste in such a manner that it does not endanger health or the environment or cause a nuisance through noise, odour or visual impacts;
(e) prevent any employee or any person under his or her supervision from contravening this Act; and
(f) prevent the waste from being used for an unauthorised purpose.

3.10 Land Use Planning Legislation

Legislation that regulates Land Use Planning has lead to “spatial planning tools” that are contained in Municipal and District Strategic Management Frameworks (SMFs), Strategic Development Initiatives (SDIs) and Municipal By-laws. These include the by-Laws of the Eden District Municipality, the George Local Municipality and the Mossel Bay Municipality. The Eden District Municipality’s Municipal Health By-Laws were Published in Western Cape Provincial Gazette 6566 of 17 October 2008. (see Chapter 8 waste management). and the Mossel Bay Local Municipality’s By-Law Relating To Public Nuisances (Published in Western Cape Provincial Gazette 6688 of 18 January 2010) has relevance. The Land Use Planning Ordinance (Ordinance 15 of 1985) has relevance in the Western Cape Province.

The Spatial Planning And Land Use Management Act 16 OF 2013 (Published under PN 227 in *Western Cape Provincial Gazette* 7427 of 15 July 2015) has the main objectives to:

- provide for a uniform, effective and comprehensive system of spatial planning and land use management for the Republic;

- ensure that the system of spatial planning and land use management promotes social and economic inclusion;
- provide for development principles and norms and standards;
- provide for the sustainable and efficient use of land;
- provide for cooperative government and intergovernmental relations amongst the national, Regulations under the SPLUMA not in force yet.

The Development Facilitation Act contains development facilitation regulations under the Regulations under Development facilitation Act 3. The Act is directed at provincial and local spheres of government; and serves to re-address the imbalances of the past and to ensure that there is equity in the application of spatial development planning and land use management systems.

3.11 The National Environmental Management Biodiversity Act (NEMBA)

NEMBA (Act 10 of 2004); Chapter 4 and 5 are important to this project, in terms of the following Regulations:

- *National List Of Ecosystems that are threatened and in need of protection* (Published under Government Notice 1002 in Government Gazette 34809 of 9 December 2012)
- Publication Of Lists Of Critically Endangered, Endangered, Vulnerable And Protected Species (Published under Government Notice R151 in Government Gazette 29657 of 23 February 2007)
- *Threatened Or Protected Species Regulations* (Published under Government Notice R152 in Government Gazette 29657 of 23 February 2007)
- *Alien And Invasive Species Regulations* (Published under Government Notice R598 in Government Gazette 37885 of 1 August 2014).
- *Publication Of National List Of Invasive Species (*Published under Government Notice R507 in Government Gazette 36683 of 19 July 20130.

3.12 National Development Plan 2030

The National Development Plan (NDP) offers a long-term perspective for development in the country. The NDP aims to eliminate poverty and reduce inequality by 2030. According to the plan, South Africa can realise these goals by drawing on the energies of its people, growing an inclusive economy, building capabilities, enhancing the capacity of the state, and promoting leadership and partnerships throughout society.

- The planning is that the NDP and its proposals are to be implemented in the right order over the next 17 years. Three phases have been identified.
- Government has already started a process to align the long term plans of departments with the NDP and to identify areas where policy change is required to ensure consistency and coherence.
- The NDP is a plan for the whole country. Government will engage with all sectors to understand how they are contributing to implementation, and particularly to identify any obstacles to them fulfilling their role effectively.
- The Plan will shape budget allocation over the next 17 years.

- The Plan identifies the task of improving the quality of public services as critical to achieving transformation. This will require provinces to focus on identifying and overcoming the obstacles to achieving improved outcomes, including the need to strengthen the ability of local government to fulfil its developmental role. Electricity provision and strengthening and adding to networks (such as this project) in support of the NDP.

3.13 Policy Guidelines

The following Guideline documents have been considered in the preparation of this report:

- Department of Environmental Affairs (DEA) Integrated Environmental Management Guideline Series 7, Public Participation in the EIA Process as published in Government Gazette No. 33308, 18 June 2010; and
- Implementation Guidelines (published for comment) in Government Notice 603 of 2010
- Integrated Environmental Management Information Series (Booklets 0 to 23) (DEAT, 2002 – 2005);
- Western Cape Department of Environmental Affairs & Development Planning (DEA&DP Guideline on Transitional Arrangements, August 2010)
- (DEA&DP Guideline on Alternatives, August 2010)
- DEA&DP, Guideline on Public Participation (August 2010)
- DEA&DP Guideline on Need and Desirability (, August 2010)
- Guidelines for Involving Specialists in the EIA Processes Series (DEA&DP; CSIR and Tony Barbour, 2005 – 2007)
- DEAT (2004) Cumulative Effects Assessment, Integrated Environmental Management, Information Series 7.

4. DESCRIPTION OF THE AFFECTED ENVIRONMENT

This section provides a description of the environment that may be affected by the proposed Blanco to Droerivier project. It is intended to provide an overview of the affected environment and is not a detailed environmental study. Detailed environmental specialist studies, which focus on significant environmental issues of the project, will be provided during the impact assessment phase.

4.1 Climate

The climate data summarized in this section originates in the Agrometeorology database at ARC-ISCW, where data from the relevant weather stations in the study area were averaged to provide meaningful long-term figures.

The study area can be broadly divided into three climatic zones, namely:

- the coastal belt,
- the Klein Karoo south of the mountains and
- the Karoo proper in the north.

The coastal belt has cool, moist to wet winters and warm, moist summers (Koch, 2006). The long-term average annual rainfall is between 800 and 1 000 mm. Average temperatures vary between 12^{o}C (daily min) and 27^{o}C (daily max) in summer and between 6^{o}C (daily min) and 13oC (daily max) in winter. The extreme high temperature that has been recorded is 39.5^{o}C and the extreme low temperature –1.5ºC.

The Klein Karoo has cool to cold, dry winters and warm, moist summers (Koch, 2006). The long-term average annual rainfall is between 400 and 500 mm. Average temperatures vary between 15^{o}C (daily min) and 33^{o}C (daily max) in summer and between 156^{o}C (daily min) and 18^{o}C (daily max) in winter. The extreme high temperature that has been recorded is 44.2^{o}C and the extreme low temperature –7.5ºC.

Frost occurs regularly between late-May and late-Auigust, but with the average annual evaporation being over 2 400 mm, the area is problematic for dryland (rain-fed) cultivation.

4.2 Topography, Soils and Geology

4.2.1 Topography

The study area comprises a mixture of mountainous and flatter topography closer to the coast, culminating in the Swartberg mountain range north of George. Further north, the flatter topography of the Karoo, classified as “Plains with low relief”, according to Kruger (1983) is prevalent all the way to Beaufort West. The altitude above sea level is around 800-900 m across the Karoo, rising to over 2 000 m in the

mountains, falling to less than 100 m near George. The topography in general slopes relatively steeply from the Outeniqua Mountains towards the sea, with foothills just south of the mountains followed by a narrow, flat coastal strip which is interspersed with river valleys.

The Great Karoo lies to the north of the Swartberg range; the Little Karoo is to the south thereof. The Little Karoo is separated from the Great Karoo by the Swartberg Mountain range, a 290 km long valley (40–60 km wide) formed by two parallel Cape Fold Mountain ranges, the Swartberg to the north, and the Langeberg-Outeniqua range to the south. The northern strip of the valley, within 10–20 km from the foot of the Swartberg mountains is a well watered area and mostly utilised for farmlands.

The southern 30–50 km wide strip, north of the Langeberg range is as arid as the western Lower Karoo, except in the east, where the Langeberg range (arbitrarily) starts to be called the Outeniqua Mountains. The Little Karoo can only be accessed by road through the narrow ravines that have been cut through the surrounding Cape Fold Mountains by rivers. On the coastal plain of the study area, the main road between Oudtshoorn and George crosses the mountains to the south via the Outeniqua Pass. The only exit from the Little Karoo that does not involve crossing a mountain range is through the 150 km long, narrow Langkloof valley between Uniondale and Humansdorp. The road between Uniondale and Willowmore forms the approximate eastern extremity of the Little Karoo.

4.2.2 Soils

Erosion is a natural, though long-term, process and without it, soil formation would not occur. However, when the process is unnaturally accelerated, usually by human intervention, the results can be severe. The two forms of soil erosion are wind erosion, where sandy topsoils that become exposed may be removed in the dry season by the action of wind, and water erosion, where topsoils that become exposed can be washed away by water flowing over the soil surface.

The study area is not one where significant zones of soils susceptible to water erosion occur (le Roux *et al.*, 2008). Susceptible areas would generally include soils where sandy topsoils abruptly overly more clayey, usually structured subsoils (“duplex” soils), but areas of such soils in area are restricted to the south. However, some significant areas of degradation in the form of sheet erosion were recorded by the National Land-Cover Database (CSIR, 2005), mostly in the north-east. Areas susceptible to erosion were identified in the specialist study, which suggests that Alternative 1 (red line) would be preferable, as it crosses less of an area that might be affected by erosion, either currently or in future.

Wind erosion is not potentially a serious problem for most of the study area. The topsoils are not excessively sandy, and the low rainfall means that grazing pressures are generally low, although organic carbon levels for the area are generally between 0.5% and 1.0% (Schoeman & van der Walt, 2004).

4.2.3 Geology

For the southern half of the area, parent material comprises a range of folded sediments, including arenite, shale, tillite and conglomerate of the Cape Fold Mountain Belt.

North of the mountains, the underlying material is mainly mudstone and sandstone of the Teekloof Formation, Adelaide Subgroup, Karoo Sequence, along with occasional dolerite intrusions (Geological Survey, 1984).

Quaternary alluvium occurs extensively in many of the lower-lying parts in the north-east, but neither route alternative crosses this area.

As shown in the map below, most of the study area (north of the Cape Fold Mountains) is underlain by the Beaufort Group. The area closest to the Mountains features the Ecca Group.

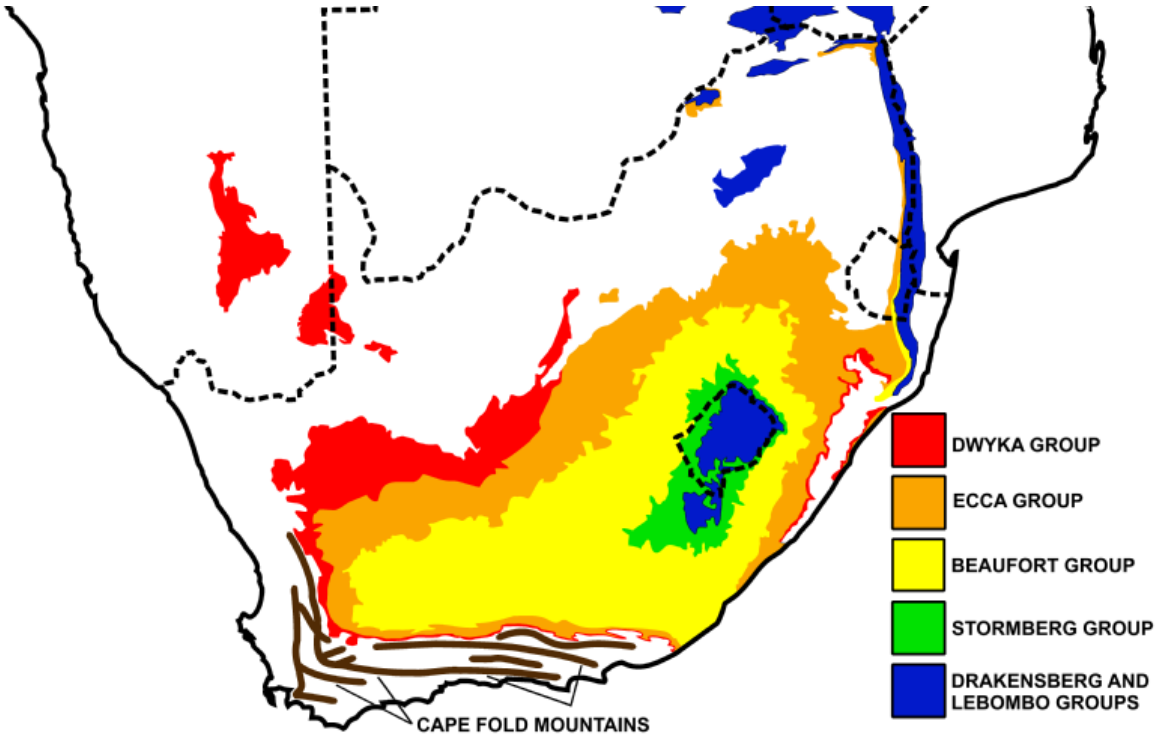


Figure 5. Geology of the Karoo Supergroup[2]

The Ecca Group consist largely of shales, and extend over the entire former Karoo Sea.

[2] *https://en.wikipedia.org/wiki/File:Geology_of_Karoo_Supergroup*

4.3 Agriculture

The study area comprises a mixture of mountainous and flatter topography closer to the coast, culminating in the Swartberg mountain range north of George. Further north, the flatter topography of the Karoo, classified as “Plains with low relief”, according to Kruger (1983) is prevalent all the way to Beaufort West. The altitude above sea level is around 800-900 m across the Karoo, rising to over 2 000 m in the mountains, falling to less than 100 m near George.

The major rivers in the area are the Olifants River, close to George, and the Gamka River, in the west of the area which is not crossed by either route alternative. The Outeniqua- and Swartberg Mountain Ranges are parallel to each other, defining an area known as the Klein Karoo. The Klein Karoo is mostly undulating topography, with the exception of the Kammanassie Mountains. Ostrich farming is synonymous with the Klein Karoo (Oudtshoorn and Kammanassie in particular) and is considered the largest commercial industry. Sheep farming in conjunction with game farming is also a popular agricultural practice. Due to the arid climate, small-scale cultivation practices are mostly concentrated along rivers.

During the site visits, the EAP has identified areas of particular sensitivity in terms of agriculture, namely: Waboomskraal, Dysselsdorp, Kammanassie and Klaarstroom. Farms that are under irrigation are sensitive in the sense that lines may impact on existing and planned pivot points.

4.3.1 Irrigated land

Where irrigation is possible, grapes and grains (wheat, lucerne and oats - the latter mainly as summer fodder for Ostriches) are the main agricultural crops. Ostriches lie at the centre of farming in the Klein Karoo section of the Alternative 1 region, although small stock and cattle are also farmed.

Zones of temporary or periodic irrigation are generally quite narrow and isolated, so that spanning such areas with a transmission line would not be problematic. However, more in-depth studies would need to be carried out at potential crossing points to avoid active areas of irrigation, such as centre-pivots or any overhead sprayers.

The coastal belt (south of the study area in the vicinity of the Blanco Substation) has sufficient rainfall for dryland cultivation, where suitable soils occur.

For Alternative 1, only isolated areas in the far south and close to Oudtshoorn may have some proportion of moderate to high potential agricultural soils. For Alternative 2, some areas in the south and at the eastern extent may also have such soils present.

The very dry nature of the prevailing climate in much of the area means that arable cultivation under dryland conditions would be impossible, and the only possibility of cultivation would be using irrigation close to the existing rivers. However, coupled to the soil restrictions mentioned above, the majority of the groundwater in the area, which might be available for irrigation, is of poor quality, with high salt content. Irrigation would therefore be a problematic proposition.

Some zones of temporary or periodic irrigation occur which are generally quite narrow and isolated, so that spanning such areas with a transmission line would not be problematic. However, more in-depth studies would need to be carried out at potential crossing points to avoid active areas of irrigation, such as centre-pivots or any overhead sprayers.

4.3.2 Grazing Capacity

The southern Karoo lies in a very dry part of South Africa, and the grazing capacity (measured in hectares required for one large stock unit) is extremely low, generally around 40-60 ha/lsu. In the wetter parts of the coastal belt, the situation is more favourable, with the capacity varying from 5-10 ha/lsu close to the coast to around 14-20 ha/lsu in the Klein Karoo (Schoeman & van der Walt, 2004).

This classification does not apply to game farming, where more detailed specialized knowledge is required, mainly in terms of relating plant species composition in both the grass layer and woody layer to the requirements of various grazing and/or browsing species of game.

4.4 Ecology

4.4.1 Vegetation

Relevant to the study area is the Uniondale Asbos-Renosterveld where Renosterbos (*Elytropappus rhinocerotis*) is dominant on south facing slopes and Asbos (*Pteronia incana*) on north facing slopes. Some geophytes are present (e.g. *Babiana sambucina, Freesia corymbosa*, etc.), including some uncommon species (e.g. Brunsvigia josephiniae and Tritonia chysantha). Only a few succulent species (Aloe ferox, Aloe microstigma, Bulbine frutescens, Gasteria brachyphylla, Glottiphyllum depressum, etc.) were observed here. Grasses (Ehrharta calycina, Eragrostis curvula, Digitaria eriantha, etc.) are also uncommon, but this may be an artifact from previous grazing practices.

Figure 6. Succulent found near Klaarstroom

Figure 7. *Nyamania Capensis,* found along the route (Alternative 2)

Figure 8. Vegetation between Willowmore and Rietbron (Alternative 2)

4.4.2 Fauna

Most animal species difficult to spot due to their small size, their nocturnal habits or restriction to the wilderness areas of conservation areas (such as Nyaru Game Reserve, the Gondwana Reserve Gondwana Private Game Reserve, Botlierskop Private Game Reserve and the Swartberg Nature Reserve areas).

Figure 9. Protected Areas which are affected by the proposed powerline alternatives

Route	Comment
B-D Alternative 1	This line crosses the Grootswartberg Mountain Catchment Area (Formal B) and the Groot Swartberg Nature Reserve

	(Formal A) protected areas in the Swartberg Mountains. The line crosses the Ruitersbos Nature Reserve and Doringrivier Wildernis Area (both Formal A protected areas) as it moves south from the Little Karoo through the Outeniqua Mountains.
B-D Alternative 2	This line crosses the most eastern section of the Swartberg-Oos Mountain Catchment Area (Formal B), and is located along the northern boundary of the Witfontein Nature Reserve (Formal A) protected area in the Outeniqua Mountain range.

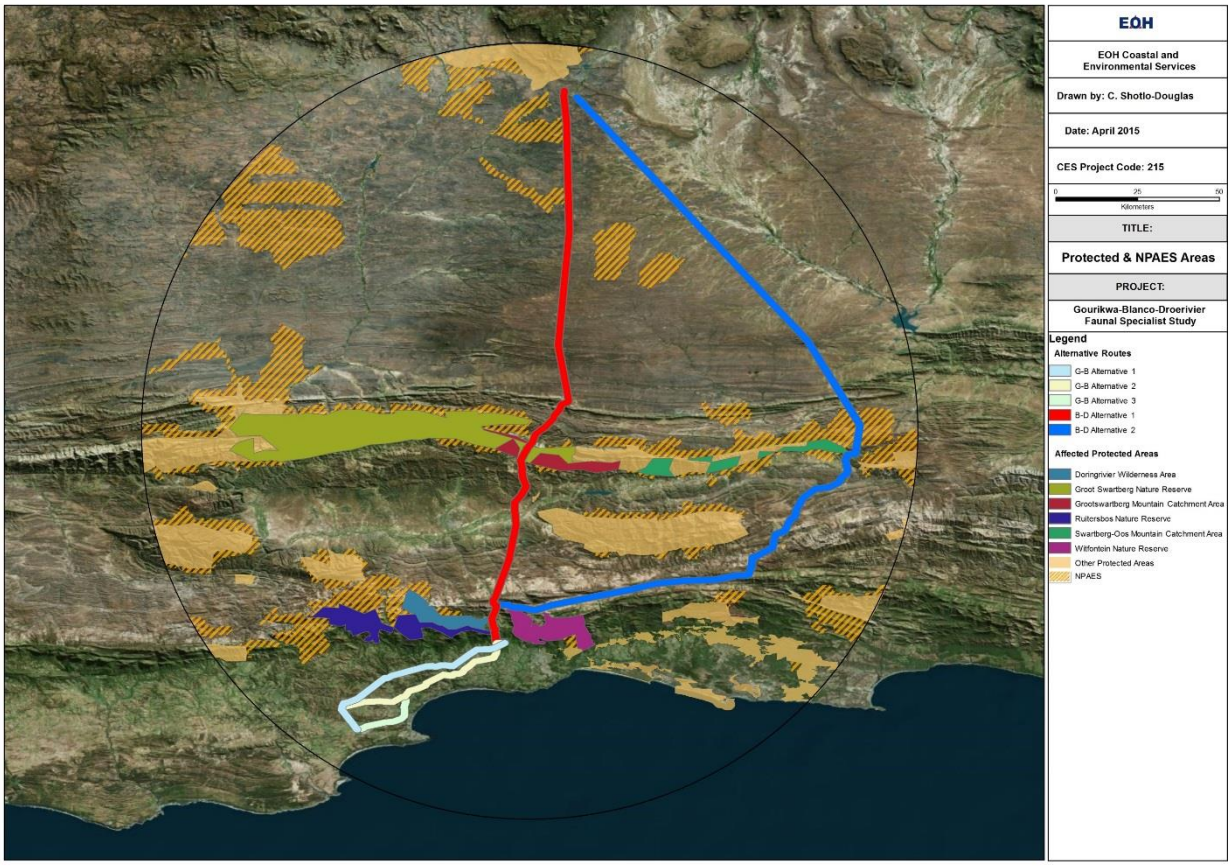


Figure 10: Protected and NPAES Areas

i. Reptiles

The ***Dwarf Karoo Girdled Lizard*** (*Cordylus aridus*) is listed as Endangered as it has a restricted range of approximately 4,200 km², and has only been found at two locations in the southern Karoo (Plate 7-1a). It is also harvested from the wild for the pet trade (IUCN, 2014). This species is known to inhabit rocky karroid vegetation (Adolphs, 2010).

The Braak's Pygmy Gecko (*Goggia braacki*) has a distribution that coincides with the northern boundary of the project area. The species inhabits rocky outcrops and escarpments in the Beaufort West region of the Karoo. Its distribution range is limited to this area (Plate 7-1b).

The species distribution of the ***Karoo Padloper*** (*Homopus boulengeri*) is fairly wide spread, with recordings as far as the central Northern Cape Province (Plate 7-1c). The

species has been recorded in various succulent and desert shrubland habitats. The Karroo Padloper is often found close to rocky outcrops which they use to seek shelter. Succulent Karroo plants and flowers form the majority of the species diet.

Fitzsimon's Long-tailed Seps (*Tetradactylus fitzsimonsi)* is a subspecies of *Tetradactylus africanus* which is divided into *T. a. africanus* and *T. a. fitzsimonsi* (IUCN, 2014). *T. a. fitzsimonsi* is listed as Vulnerable due to its patchy, very limited distribution. Recordings of the species confine it to coastal fynbos in the Algoa Bay area, with an isolated population within the project area (Plate 7-1d).

ii. Mammals

One **Critically Endangered**, one **Endangered**, one **Protected,** and one **Vulnerable** mammal species have distributions that coincide with the project area and are listed on National Environmental Management: Biodiversity Act (NEMBA). NEMBA identifies species that have a high conservation value or national importance that require national protection (DEAT 2007). Additionally, 11 species are listed on the IUCN Red Data List under varying statuses.

Figure 11: **Mammals of conservation concern likely to be found within the project area.**

Scientific Name	Common Name	NEMBA
Amblysomus corriae	Fynbos Golden Mole	-
Bunolagus monticularis	Bushman Hare, Riverine Rabbit	Critically endangered
Ceratotherium simum	White Rhinoceros	-
Chlorotalpa duthieae	Duthie's Golden Mole	-
Diceros bicornis	Black Rhinoceros, Hook-lipped Rhinoceros	Endangered
Equus zebra	Cape Mountain Zebra	-
Felis nigripes	Black-footed Cat, Small-spotted Cat	-
Hyaena brunnea	Brown Hyena	-
Mellivora capensis	Honey Badger	Protected
Myosorex longicaudatus	Long-tailed Forest Shrew	-
Mystromys albicaudatus	White-tailed mouse	-
Panthera pardus	Leopard	Vulnerable

Figure 12: Brown Hyena *(Photo courtesy of Gerrie van Vuuren)*

Although the Honey Badger (*Mellivora capensis*) is not protected by IUCN, it is a protected by NEMBA within South Africa due to threats from habitat loss and hunting pressures. The project is unlikely to significantly influence the species as it is found in a wide range of habitats and altitudinal tolerances. Honey Badgers are opportunistic, generalized carnivores, and feed on a range of prey items varying in size from small insect larvae to the young of ungulates. **Certain habitats within the project area are suitable for Honey Badgers.**

The vulnerable White Rhinoceros (*Ceratotherium simum*), and Critically Endangered Black Rhinoceros (*Diceros bicornis*) are both likely to occur within the project area according to historical records and current species distribution spatial tools. However, due to the current state of poaching within South Africa these species will only be found within protected areas and game reserves where they can be monitored. **No free roaming rhinoceros species are expected to be found within the project area.**

The Vulnerable Cape Mountain Zebra (*Equus zebra*) has a distribution range including the project area. Surviving natural populations of Cape Mountain Zebra occur only in Mountain Zebra National Park, Gamka Mountain Reserve, and the Kamanassie mountains. The Gamka mountain reserve and the Kamanassie Mountains are both found within the greater project area. Populations have been reintroduced to various parts of their former range, including Karoo National Park and Baviaanskloof Wilderness Area within the project area. Mountain Zebra inhabit rugged, broken mountainous and escarpment areas up to around 2,000 m, and require access to a diversity of grass species and perennial water sources (Penzhorn in press cited in IUCN, 2014). **Habitats suitable to this species are found within the project area.**

Although the Small Spotted Cat (also referred to as the Black-footed Cat) is globally Vulnerable, it is no longer protected by NEMBA as it has a vast distribution range and occurs in many habitats. It is a specialist of open, short grass areas with an abundance of small rodents and ground-roosting birds (Brand, 2015). It inhabits dry, open savanna, grasslands and Karoo semi-desert with sparse shrub and tree cover. **Habitats suitable to this species are found within the project area.**

The Brown Hyaena (*Hyaena brunnea*) is an endemic, widespread species within southern Africa, except for a marginal extension into the arid parts of south-western Angola. In recent years the species has been recorded in Gansbaai and Bredasdorp in the Western Cape, suggesting that the species could also be found in the project area. It is believed that the Brown Hyaena is recolonizing areas following the historical removal of the species in the area due to hunting (Hofer and Mills 1998a). It is found in dry areas along the coast, semi-desert, open scrub and open woodland savanna, favouring rocky, mountainous areas with cover (IUCN, 2014) having the ability to survive close to urban areas. Brown Hyaena are mainly scavengers, but supplement their diets with wild fruits, insects, birds' eggs and the occasional small animal which is killed; their impact on domestic livestock is usually small (Mills 1998; in press). However, outside protected areas, the Brown Hyaena may come into conflict with humans, and they are often shot, poisoned, trapped and hunted with dogs in predator eradication or control programmes, or inadvertently killed in non-selective control programmes (Mills 1998). Although the project area has many habitats suitable for the species, due to historical events described it is unlikely to find an abundance of this species within the project area. **It is possible that individuals may visit the project area on occasion.**

Leopards (*Panthera pardus*) have habitat tolerances including mountain habitats, coastal scrub, shrubland, semi-desert and desert (IUCN), all of which are found within the project area. Included in their diets are more than 90 species of sub-Saharan Africa fauna, ranging from arthropods to large antelope (Ray *et al.*, 2005). The distribution range of the species is becoming patchy due to predatory control programmes as well as habitat loss. **Leopards have been found to occur within the project area** (pers. comm. Warwick Zondagh).

Figure 13: Klipspringers spotted during site visit (Swartberg Mountains) [3]

According to IUCN (2014), the Riverine Rabbit (*Bunolagus monticularis*) is one of the most endangered mammals in the world, with only around 250 living adults remaining in the wild. No subpopulation is estimated to contain more than 50 individuals, and these subpopulations appear to be isolated due to anthropogenic barriers that prevent dispersal. **An isolated subpopulation occurs within the project area**. Due to the species conservation status, it is highly recommended that the distribution range of this subpopulation is surveyed. Subpopulations appear to be isolated from each other by jackal-proof fencing and severe land transformation through agricultural practices (Collins et al. 2004). The species inhabits dense riparian growth along the seasonal rivers in the central Karoo, and within shrubland in the Nama-Karoo (IUCN, 2014). The habitat is usually highly fragmented and transformed.

[3] *April 2015*

Figure 14: Endangered Riverine Rabbit (*Bunolagus monticularis*)

Based on the available spatial planning tools and species distribution data, the B-D **alternative 1 is the preferred route** for the Blanco to Droërivier section of the proposed power line. However, this recommendation is subject to establishing the known distribution range of the subpopulation of Riverine Rabbit in the northern section. It is also suggested that the route be re-aligned to avoid the SKEP reptile priority area north of the Swartberg Mountains. If chosen, on ground surveying of 'sensitive' areas should take place along the route to accommodate adjustments to the alignment (e.g. avoiding rocky outcrops and habitats suitable for SCC).

During field visits, riparian areas which provide habitat for the Riverine Rabbit within the species distribution range should be identified and avoided where possible. Areas where the proposed power line transects Critical Biodiversity Areas should be surveyed to determine impacts on the fauna prior to the completion of the Environmental Impact Assessment.

4.4.3 Avifauna

During the field trip (April 2015) the land owners reported that there had been considerable numbers of collisions occurring on the existing trans-mission power lines, particularly were the lines were in close proximity to the dams. Species involved were Blue Crane, Egyptian Geese, Eagle-Owl, Kori and Ludwig's Bustard. The existing transmission power lines crossing the properties were not fitted with Bird Flight Diverters.

Rainfall in Nama Karoo is mainly in summer while Succulent Karoo receives rain in winter, this provides opportunities for the migration of avian species between the Nama Karoo and Succulent Karoo to take advantage of the enhanced conditions associated with rainfall.

The study area has two major vegetation divisions, namely Fynbos proper and Renosterbos. Renosterveld has now been largely replaced by Agricultural crop fields and planted pastures. The endemic avifauna consists of, Cape Rockjumper, Cape Sugarbird and Cape Siskin. The Black Harrier, endemic to Southern Africa is likely to have most of its breeding grounds in the Fynbos but is associated with Forest-edge habitats. The Fynbos also shares some Avian species with the Karoo such as the Greybacked Cisticola and the Karoo Prinia.

The introduction of alien trees and the establishment of crop fields, and planted pastures in the Fynbos has resulted in numerous Avian species colonizing or increasing in abundance in these areas.

Avian species that are most consistently affected by over head transmission lines are water birds that congregate at wetlands and commute between them in flocks, examples being large and / or fast flying species examples such as ducks, geese, flamingos, storks, herons and waders, that have a high collision rate. Game birds and

rails have less exposure but are still highly susceptible. Cranes, storks, bustards, *korhaans* which are large heavy bodied, flocking and low flying are also highly susceptible to collisions with over head transmission power lines.

During the Public Participation Process, I&APs have expressed their concern about the endangerment of birdlife that is currently occurring in nature reserve areas. Their perception is that the pylons for the line can have a negative impact on the bird life, or if larger birds fly into the power lines. Secretarybirds (Sagittarius serpentarius), Denham's Bustard (Neotis denhami), the Martial Eagle (Polemaetus bellicosus) and the Black Harrier (Circus maurus) are species of concern. Smaller passerine birds could also be affected by the construction, and consequential habitat destruction of the pylons. During the field trip the land owners reported that there had been considerable amounts of collisions occurring on the existing trans-mission power lines, particularly were the lines were in close proximity to the dams. Species involved were Blue Crane, Egyptian Geese, Eagle-Owl, Kori and Ludwig's Bustard. The existing transmission power lines crossing the properties were not fitted with Bird Flight Diverters. The Red Data Species that have been reported on this route.

- White Stork: Conservation status; Rare.
- Black Stork: Conservation status; Indeterminate.
- Martial Eagle; Conservation status; Vulnerable.
- Kori Bustard Conservation status; Vulnerable.
- Stanley's Bustard Conservation status; Vulnerable.
- Ludwig's Bustard Conservation status; Vulnerable.

Figure 15: Denham's Bustard and Ludwig's (Kori) Bustard
(Photos with permission from Wessel Rossouw)

The following list illustrates the birds of specific interest that can be found in the Karoo area, and has been compiled from the bird list received from the Olive Grove Guest Farm.

Grey Heron
Blackheaded Heron
White Stork
Black Stork
Abdim's Stork
Steppe Buzzard
Jackal Buzzard
Blue Crane
Kori Bustard
Ludwig's Bustard

Greater Flamingo
Black Eagle
Booted Eagle
Martial Eagle

Karoo Korhaan
Barn Owl
Spotted Eagle Owl

Figure 16: Black Eagle, Cape Owl, Black Stork
(Photos with permission from Wessel Rossouw, Gerrie van Vuuren)

4.5 Land use and Socio-Economical Profile

The study area for Alternative 1 consists of the Central Karoo and Eden District, with a portion of the Alternative 2 route located in the Cacadu District.

Figure 17: Districts relevant to the study area

The local municipalities that form part of the Alternative 1 proposed transmission line study area are the George Local Municipality (WC044 part of Eden), Oudtshoorn Local Municipality (WC045 part of Eden), the Prince Albert Local Municipality (WC052 part of Central Karoo) and Beaufort West Municipality (WC053, part of the Central Karoo DC5).

The local municipalities for Alternative 2 include George Local Municipality (WC044 part of Eden), Baviaans Local Municipality (EC107, part of Cacadu) and Beaufort West Municipality (WC053, part of the Central Karoo DC5).

The table below shows selected socio-economic data from the 2011 census and Quantec. This includes population and household density figures for the municipalities.

Table 2: Population, household and density data for local municipalities located in the study area[4]

Municipality	Prince Albert Municipality (WC052)	Beaufort West Municipality (WC053)	George Municipality (WC044)	Oudtshoorn Municipality (WC045)	Baviaans Municipality (EC107)
Province	Western Cape	Western Cape	Western Cape	Western Cape	Eastern Cape
District	Central Karoo	Central Karoo	Eden	Eden	Cacadu
Population (2011)	13 136	49 586	193 672	95 933	17 761
Area size km^2	2 015	21 917	5 191	3 537	11 668
Population density (population per km^2) (2011)	1.6	2.3	37.3	27.1	1.5
GVA (2011)	R327.06 million	R1 607.4 million	R8 851 million	R3 376.8 million	R522 million
Major sectors	Business services (R86m), Construction (R50m), General government (R41m).	General Government (R259m), Wholesale and retail (R235m), Transport and storage (R222m).	Wholesale and retail (R1490m), Business services (R1303m), General government (R1295m).	General government (R891m), Wholesale and Retail (R489m), Business services (R399m).	General government (R221m), Community, social and personal services (R71m), Agriculture R57m.
Main land use in local municipalities	Small stock grazing (Dorpers Merinos, and Angoras). Olive and fruit farms.	Small stock grazing (Dorpers Merinos, and Angoras) 6 ha per small stock unit.	Forest (timber), cattle, wine, tourism	Ostriches, seed production, wine, tourism.	Small stock grazing (Dorpers Merinos, and Angoras).
Unemployment rate	32.5%	30.7%	19.3%	23.7%	16.5%

Results of the desktop investigation show the low population and activity for the proposed transmission lines in the Beaufort West, Prince Albert and Baviaanskloof Local Municipality, with increased population, economic and agricultural activity in the Oudtshoorn and George

[4] *Source: StatsSA, own calculations, Municipal LED's*

Local Municipality. The largest town of the Klein Karoo is Oudtshoorn but it is located outside of the project area..

i) Prince Albert Municipality (WC052)

Prince Albert Local Municipality is one of 3 municipalities in the Cape Karoo District Municipality. It is a sparsely populated area with great distances between towns. It is a vast semi-desert area and one of the world's most interesting arid zones. The total population in the municipality is estimated at just over 13 100 according to the 2011 Census. Given the area size of 2 015km2 provides a very low population density of 1.6 people per km2. Prince Albert is the main town and has an estimated population of just over 7 000 according to the 2011 Census. Other areas include the village Leeu-Gamka (population 2 727) and Klaarstroom (population 584). Klaarstroom is a small rural village east of Prince Albert close to the northern access to Meiringspoort. The town is a residential village with limited facilities. Local farms have been found to have higher agricultural potential than those in the more northern areas of the Central Karoo.

Figure 18. Old World character of the town Klaarstroom (Alternative 1)

The GDP of the municipality is estimated at R327 million (2011) while unemployment is estimated at over 31%. The major contributing sectors to the GDP includes business services (R86 million), construction (50 million) and general government (R41 million). Agriculture (about 958 000 hectares) includes small stock farming, olive farms and fruit farms. The area is well known for fresh and sun-ripened dried food particularly apricots and figs, Karoo lam and olives, olive oil and home-made cheese.

Prince Albert is situated at the foot of the Swartberg Mountain range and is blessed with a perennial water supply. The Swartberg Mountain range is a World Heritage Site and part of the Cape Floral Kingdom that boasts the greatest number of plant species, particularly fynbos, in the world. The town has a number of tourist attractions including authentic Cape Dutch, Karoo and Victorian buildings, thirteen of which are National Monuments, with a further five in the district. The town is also well-known for its Olive

Festival. Other activities include birding, hiking, cycling and stargazing. The town also houses the Villa Kruger art house and sculpture garden. The town is also the centre of the mohair producing region of South Africa and is also emerging as a quality wine producing area. Prince Albert also has one of the oldest and last remaining working watermills in South Africa.[5]

ii) Beaufort West Municipality (WC053)

Beaufort West Municipality is one of 3 municipalities in the Cape Karoo District Municipality. It is a sparsely populated area with great distances between towns. It is a vast semi-desert area and one of the world's most interesting arid zones. The total population in the municipality is estimated at just over 49 500 according to the 2011 Census. Given the area size of 21 917 km2 provides a very low population density of 2.3 people per km2. Beaufort West is the biggest town in the municipality, with just under 56% of the population.

Unemployment in Beaufort West is very high (estimated at about 58% according to the expanded definition) and the majority of the residents are employed in commerce, community services and agriculture. Beaufort West has identified a number of opportunities in their IDP that includes wind farming and renewable energy (Beaufort West IDP 2012 -2017).

As mentioned, agriculture and tourism are the dominant economic sectors. Agriculture involves mainly small stock farming with Dorpers, accounting for about 57% of the small stock followed by Merinos (24%) and Angoras (14%). The small stock unit (ssu) for the farming region Nelspoortrante (the area around Beaufort West) is a low 6 ha per ssu. The main agricultural products are wool, mohair, mutton and skins. Wool and mohair are exported with very little local value added. The wool farming industry is the largest production in SA and the meat production is the second largest contribution to the regional economy.

Road traffic that passes through Beaufort West is the main source of income. According to the SDP of Beaufort-West, unconfirmed estimates for the amount of money injected into the local economy by passing traffic are between R200 – R500 million per year. The noise pollution of especially the heavy trucks passing through, makes it difficult for overnight tourism establishments close to the N1 and city centre.

Currently there is a tendency to convert agriculture farms to game lodges – there are currently 5 commercial game farmers as well as other farmers keeping smaller herds of Springbok (according to the Beaufort West IDP for 2012 – 2017).

[5] *The Great Karoo, Prince Albert Tourism Info*

Wind farming and renewable energy in the form of photovoltaic solar are listed as opportunities identified in the 2012 -2017 Integrated Development Plan of Beaufort West that would serve as long term income generators for the municipality and subsequently creating on-going jobs in the community.

iii) George Municipality (WC044)

George Local Municipality is one of 7 municipalities in the Eden District Municipality. It has an estimated population of over 193 500 and a population density of 37.3 people per km^2. George is the major city within the area and has an estimated population of 157 394 according to the 2011 Census. Other towns include Wilderness (population 6 164), Uniondale (population 4 525), Haarlem (population 2 376) and Harolds Bay (population 704). The municipality covers an area of 5 191 km^2 in the Garden Route and Little Karoo. It extends northeast over the Outeniqua Mountains to include the eastern end of the Little Karoo as far as the Swartberg mountains. George is a popular holiday and conference centre and the administrative and commercial hub of the Garden Route.

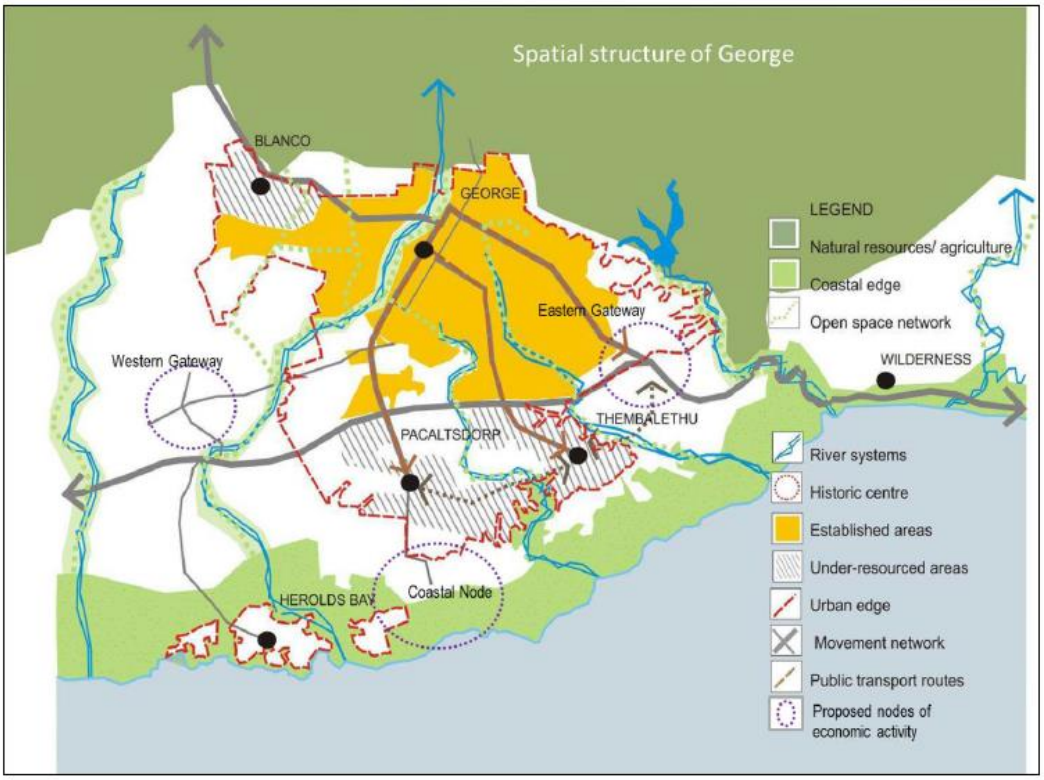


Figure 19: Spatial Structure of George (Source: George IDP, 2014/15)

The GDP of the George Local Municipality is estimated at R3.38 billion with general government (R891 million), wholesale and retail (R489 million) and business services (R399 million) contributing the most.

The municipal area straddles the Southern Cape and Little Karoo regions of the Western Cape Province, and is situated almost halfway between Cape Town and Port

Elizabeth. It was stated in the Integrated Development Plan (IDP) for George (2014/15) that the George Municipality now administers a vast and diverse geographic area that extends from the dry and climatically extreme Little Karoo in the north, to the wetter more temperate Garden Route in the south.

The area is rich in natural beauty that includes mountains, forests, lakes and the sea. The utilisation of forest trees led to the establishment of a timber industry in 1776 by the Dutch East India Company.

Three important national roads – N2, N9 and N12 – feed the area, and George regional airport serves the Southern Cape and Little Karoo, including the neighbouring towns of Mossel Bay, Oudtshoorn, Knysna and Plettenberg Bay. Prior to the incorporation of Wards 24 and 25 the municipal area was 1 068 km² in extent, but the DMA has added an additional 4 170 km². Stats SA report that 148 021 people lived in the area in 2007 (including the previous DMA), of which approximately 80% resided in the regional service centre of George, 12% in the towns, villages and coastal enclaves of Wilderness, Herolds Bay, Uniondale, Touwsranten, Haarlem, Hoekwil, and Victoria Bay, and 8% in rural hamlets and on farms. According to the George Economic Development Profile, 2012, the total population for 2011 is estimated at 188188 with a 2.1% growth rate per annum since 2008. The map below depicts the spatial structure of the town of George and hinterland.

The municipal area also includes fertile farmlands and timber plantations along the coastal plain, fruit orchards in the Langkloof and arid grazing areas in the Little Karoo. The George area has an active, high-value **agricultural sector** including produce such as hops, vegetables, flowers and dairy products, and aquaculture. Although these activities may not create many jobs, they contribute significantly to local employment and earnings with steady land-reform efforts helping to reduce inequalities[6].

Given the rapid population growth and the role of the Southern Cape as retirement haven for many South Africans, the **construction sector** foresees steady growth and at least stable employment. Although George is not a coastal resort, these trends should also apply to the town. In addition, the local climate and a strong forestry sector help to create a much wider range of building structures than found in other parts of South Africa.

Notwithstanding certain limiting factors (like the rising fuel price) the **tourism sector** of the Southern Cape remains one of the strongest pillars of future LED[7]. This also applies to George, even though it is not located at the coast. Through its central location within the “tourism region” George is able to attract many tourism, accommodation and catering-related specialist services and facilities, which help to stimulate LED. Natural assets include parts of the Garden Route National Park and the Baviaanskloof Wilderness Area.

[6] *Second Review of the George IDP 2014-15*

[7] *Second Review of the George IDP 2014-15*

Due to its location, George attracts much of the region's more specialised retail and wholesale trade establishments. This further boosts this sector and is not likely to change in the foreseeable future. It is, however, key that the municipal and district managements satisfy the accommodation and other requirements of these enterprises.

Although the relatively small population of the area has prevented the Southern Cape from becoming a major **industrial growth** point, the area has over the years succeeded in attracting some innovative industries (in bio-tech, ICT software and agro-processing). The closure of some factories in the recession years has illustrated the negative impact of sector problems and has stressed the need for proactive municipal policies.

George currently has the widest spectrum of school and post-school education facilities in the Southern Cape[8]. These include quality private schools as well as university and other tertiary-level facilities. It seems likely that these facilities will enlarge in line with expanding local needs and national trends in educational-supply facilities. Once again, such expansion depends quite crucially on the municipality's policies of facilitation.

George has a wide range of health facilities and services, and it would seem natural for this position to continue in future if facilitated by local, district and provincial authorities.

There are a number of tourism attractions, including the George museum, Outeniqua Mountains, Montagu Pass (that was declared a National Monument in 1972), Fancourt (National Monument and well-known hotel) and Lake system (Wilderness, Swartvlei, Sedgefield and Groenvlei). The area is host to the George Veteran Motor Show, that was first held in 1997, the George Cheese Festival (since 2002) and the George NAM Sevens Premier League. The George airport was built in 1977 and served 560 432 passengers in 2013, up from 154 000 in 2003.

In the 2014/15 IDP, the George Local Municipality highlights the need to promote the municipality as a sports, tourism and business destination. This includes the re-establishment of a Tourism Bureau, and projects like the Apple Express and the Outeniqua Choo-Choo train project are essential for tourism development in the rural areas. Further tourism opportunities include business tourism, agri-tourism, eco-tourism (hiking, birding, etc) and adventure-tourism potential like paragliding, canoeing, absailing, diving and mountain biking. Strengths also include the natural beauty of the area, the national parks, moderate climate, long sandy beaches and good hotels, guesthouses and restaurants.

[8] *Second Review of the George IDP 2014-15*

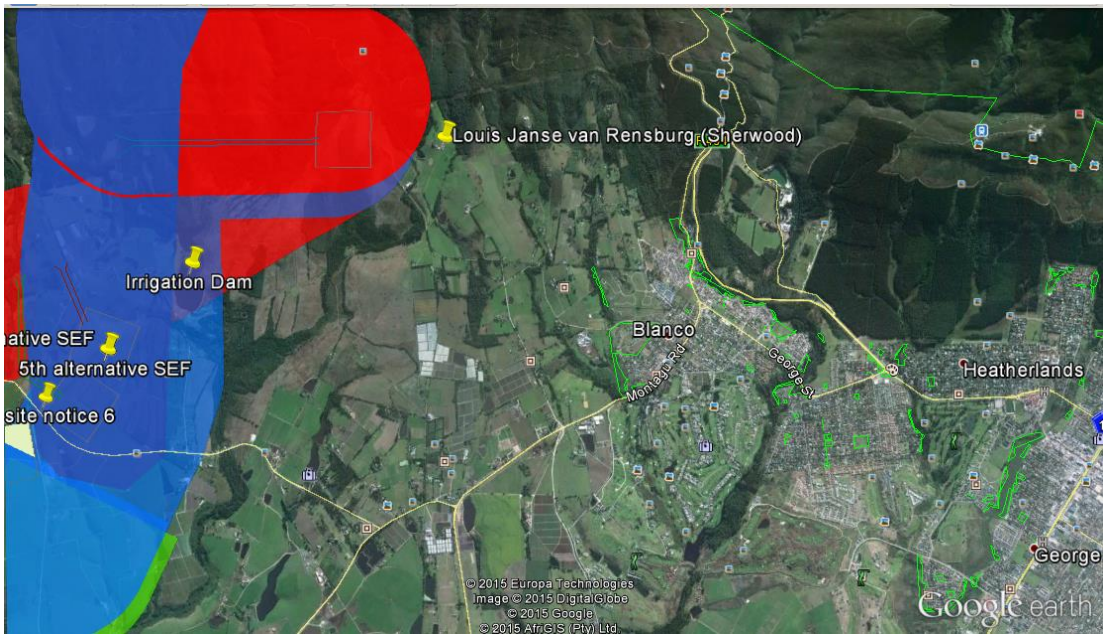


Figure 20: Location of George and Blanco suburb in relation to the project

iv) Oudtshoorn Local Municipality(WC045)

Oudtshoorn Municipality is situated in the heart of the Little Karoo and stretches along both sides of the Grobbelaars River. It is sheltered by the Swartberg Mountains to the north and the Outeniquas in the South. Oudtshoorn Local Municipality is one of 7 municipalities in the Eden District Municipality. It is a semi-arid area with a total population estimated at just under 96 000 according to the 2011 Census. Given the area size of 3 537km2 provides a population density of 27.1 people per km2. Oudtshoorn is the main town and has an estimated population of just over 61 500 according to the 2011 Census. The GDP of the municipality is estimated at R3 376.8 million (2011) while unemployment is estimated at over 23.7%. The major contributing sectors to the GDP includes General Government (R891 million), wholesale and retail (R489 million) and business services (R399 million). The economy relies on agriculture (including ostriches, seeds and wine) and tourism. The Oudtshoorn army base houses the SA infantry school. **Neither of the Alternatives for the proposed transmission power lines will not impact directly on the town of Oudtshoorn but farms that are located in the Oudtshoorn jurisdiction may be impacted upon.**

Oudtshoorn Local Municipality is one of 7 municipalities in the Eden District Municipality. It is a semi-arid area with a total population estimated at just under 96 000 according to the 2011 Census. Given the area size of 3 537km^2 provides a population density of 27.1 people per km^2. Oudtshoorn is the main town and has an estimated population of just over 61 500 according to the 2011 Census.

Other areas include the town Dysselsdorp east of Oudtshoorn (population 12 544), De Rust (population 3 566), Armoed (population 472) and De Hoop (population 151). Neither of these towns are directly influenced by the proposed Alternative 1 or 2, but tourism, roads farmlands surrounding the towns may be impacted upon during construction.

Figure 21: Location of Oudtshoorn, Dysselsdorp and De Rust

Dysselsdorp is located about 30 kilometres from Oudtshoorn, and 13.5km from De Rust, at the foot of the Kamanassie Mountains, lies Dysselsdorp,. The town was founded in 1838 as a mission station by the London Missionary Society, in 1877 it's approximately one and a half thousand hectares were granted in freehold to the 148 resident families by the then Commissioner of Crown Land, John X. Merriman. Residential as well as garden plots were allotted and the town was practically self-sufficient in those days. However, as in most contained small agricultural communities, poverty became a factor and today most of the young people hold jobs in Oudtshoorn or work as seasonal labour on neighbouring farms.

Dysselsdorp's liquorice factory is the sole producer of liquorice concentrate in South Africa, produced from a local plant, the liquorice root. The liquorice plant (Glycrrhiza glabra) flourishes on the banks of the Olifants River outside Dysselsdorp. The Dysselsdorp Liquorice company is the culmination of a development initiative begun in 1996 by the CSIR and the then Department of Economic Affairs and RDP in the Western Cape, to establish a community based liquorice harvesting and extraction project in the town. Most of the liquorice produced here, goes into the manufacturing of cigarettes.

De Rust has a population of 3 566 and is located at the foot of the Swartberg mountains, about 35 km from Oudtshoorn. The village is characterised by its rural character and late 19th century architecture, features that stimulate the tourism industry. Ostrich farming is practiced on the surrounding farms. De Rust was established in 1900 on a portion of Meirings farm. Petrus Johannes Meiring extensively explored the Swartberg Mountain range and discovered the route through it, following the Karoo's Great River (Groot Rivier) which flows through the gorge, and crosses the 25km tarred road 25 times[9]. This gorge and meandering pass is now known as the Meiringspoort. Long before the village of De Rust was established, it had already been used as a rest stop before trekking through the poort (canyon).

[9] *http://www.derust.org.za/*

v) Baviaans Municipality (EC107)

Baviaans Local Municipality is one of 10 municipalities in the Cacadu District. It is a semi-arid area with a total population estimated at just over 17 700 according to the 2011 Census. Given the area size of 11 668 km2 provides a very low population density of 1.5 people per km2. Willowmore is the main town and has an estimated population of 6 398

according to the 2011 Census.

Figure 22: Location of Willowmore to the east of Alternative 2

The GDP of Baviaans is estimated at R522 million in 2011, while general government (R221 million), community, social and personal services (R71 million) and agriculture (R75 million) add the most to the GDP of the municipality. The unemployment rate is estimated at 16.5%.
The narrow valley of the Baviaanskloof is less than 200 kilometers in length and bounded by two mountain ranges: the Baviaanskloof Mountains on the north and the Kouga mountains on the south side. The valley lies at a lower altitude than the Karoo in the north. Rainfall of the Karoo thus filters through the mountains to the Baviaanskloof River. For this reason the valley is surprisingly lush and supports a wider variety of plant species than would have been otherwise expected. Nature has taken its course over thousands of years to create what is today universally recognised as the Baviaanskloof World Heritage Site (part of the Cape Floral Region World Heritage Site). Seven of South Africa's eight biomes (major natural regions) are represented here including fynbos, forest, grassland, succulent Karoo, nama-karoo, sub-tropical thicket and savannah (The Great Karoo, Baviaanskloof Information).

4.5.2 Road and Rail

Proclaimed provincial roads make up the bulk of roads between towns in the Central Karoo. Of these, the N12 links to the N1 at Beaufort West and connects to Oudtshoorn, George, the Southern Cape and the N2. The R61 also connects with the N1 at Beaufort West and provides access to Aberdeen/Graaff-Reinet and the inland areas of the Eastern Cape. The R63 trunk road connects to the N1 in the northeast of the area and passes to the south through

Murraysburg and on to Graaff-Reinet, and to the north, to Victoria West in the Northern Cape. The R407 connects Prince Albert with the N1 in the north at Prince Albert Road, and connects with the N12 in the south. The R309 (Vleiland Road) to Seweweekspoort, which connects to Calitzdorp, is a vital link between Laingsburg and the R62, and the R309 requires upgrading.

The roads are maintained on an agency basis by the District Municipality on behalf of the Provincial Government Department and funding is provided for the service provided. Projects are registered and the agency service is delivered in terms of an agreed programme. There is no known road planning that will directly affect the development.

An existing main railway line is located along the N12 and could be utilised to transport equipment to the site. A station is located in the area and it should be possible to use the station (depending on the status of roads serving the station). Although the railway line is active, it must be accepted that all equipment might not be transported via rail, with the result that one or more of the other routes mentioned, will also be utilised. From a roads and traffic point of view, utilisation of the railway line should be considered.

4.5.3 Solar Power Plants (Droërivier Solar Power Plant (Pty) Ltd)

A solar power plant is located in the vicinity of the proposed Alternative 1 route. Portion 10 of Farm 170 Weltevreden and Portion 55 of Farm 168 Steenrotsfoutain, 1295ha is extent located approximately 7km south-west of the town of Beaufort West, directly west and adjacent to the N12 provincial highway. The proposed solar development site is situated direct adjacent to and west of the N12 Provincial Road, approximately 3km south of the existing Eskom Droërivier Substation. DEA Reference: 14/12/16/3/3/2/715

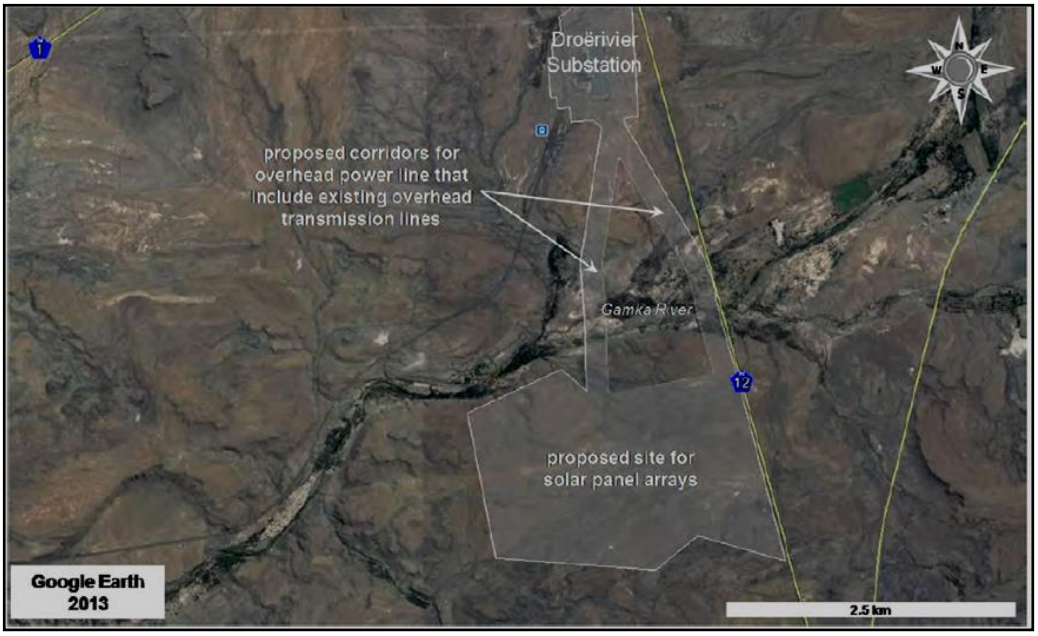


Figure 23. Proposed Solar Farm to the south of Droërivier Substation

4.5.Wind Farms (Mainstream RP)

Alternative 1 will encroach on Mainstream RP's existing Wind Farm development in the Beaufort West area, and will result in approximately 42 of their turbines being affected. Environmental Authorisation has been given for this project (DEA reference No. 12/12/20/1784/AM1) Discussions were held during the PPP, followed up with e-mail correspondence and a meeting with representatives from Mainstream and Eskom on 29 May 2015 at Megawatt Park. The meeting has resulted in the decision to reduce the number of turbines, and avoid the area where the transmission power line is proposed.

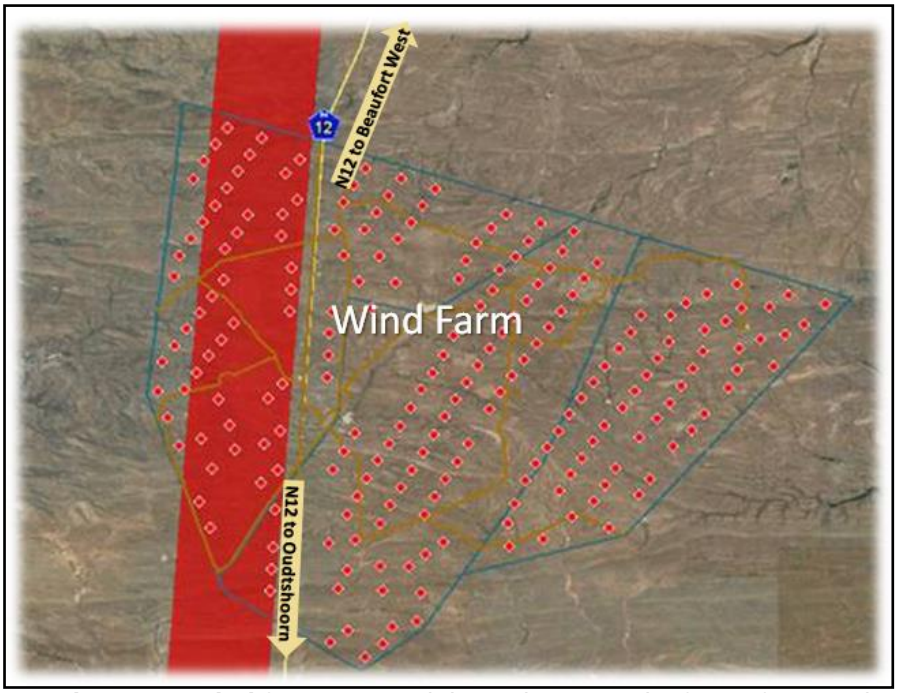


Figure 24. Wind farm Layout (Alternative 1, south of Beaufort West)

i) Existing lines

Power lines already runs through the area, and land owners are concerned about the cumulative impact of the lines should another line be introduced. The question is also asked whether the lines could not be combined. Eskom has indicated that the combination has been considered, but that such an option would still require a new servitude where the upgraded (higher, stronger) pylons will then be erected to carry the new proposed 400kV line along with the line that already exist. Only after this has been done, the old lines can be "transferred" to the new structures and the old structure taken down.

Figure 25: Waboomskraal valley indicating existing powerlines (Outeniqua mountains)

Figure 26: Landscape to the south of Dysseldorp

ii) Mining and shale gas potential

The Karoo is the geographic area that is the focus of future hydraulic fracturing in South Africa, derived from a word in the local language meaning "dry". Previously a lake millions of years ago, shale gas began to form in the low-oxygen Karoo as organic mud accumulated As pressure increased over time, the organic material within the mud gradually turned into oil and gas trapped in shale rock. Estimates on how much gas is in the Karoo vary, with the Energy Information Administration (EIA) estimating reserves of 390 trillion cubic feet, which would make it the eighth largest reserve in the world. These figures, however, were based on desktop research and would only be refined through an extensive exploration programme.

Unique to the Karoo shale reserves is the presence of dolerite dykes intruding into targeted shale, which makes accessing the natural gas much more difficult and uncertain.

The map below shows the Technical Cooperation Permit holder along the southern edge of the Karoo basin. These include Falcon Oil and Gas Ltd (30000km^2), Shell (185000 km^2), Sunset Energy (4600 km^2), Sasol/Chesapeake/Statoil JV (88000 km^2) and Anglo Coal (50000 km^2).

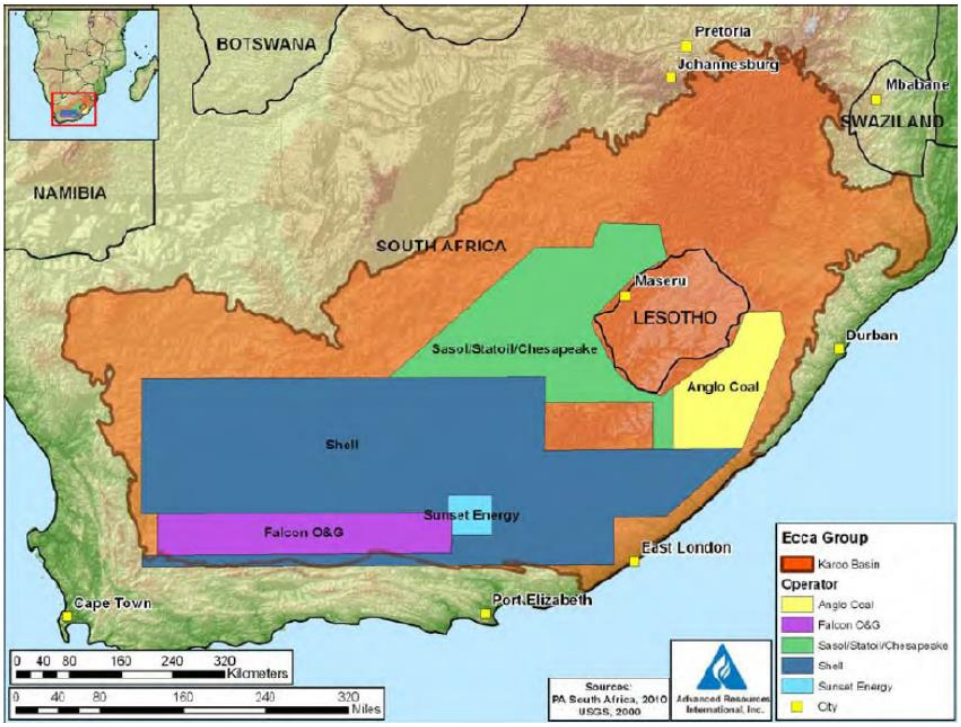


Figure 27: Technical Cooperation Permit (TCP) areas in the South Africa[10]

According to an Econometrix report (2012) on shale gas there is an estimated (but unproven) technically recoverable amount of 500 trillion cubic foot of shale gas in South Africa. This ranks SA as the world's fifth largest resource of shale gas and is equivalent to 400 years of crude oil requirements for the SA economy.

Although potential damages to the environment, potential economic benefits can be vast. According to Econometrix (2012), the total upstream value added in scenario A adds R760 billion during a 25 year period (production life) and scenario B has upstream value added of R2 142 billion (9.3 times the value of mining GDP in 2010). Scenario A provides a total production chain average employment of just over 290 000 jobs and Scenario B provides an average annual employment of just over 700 000 jobs. This can enhance economic development in the Karoo, although there are numerous actions against prospecting and the development of shale gas, given the potential negative impacts on the environment.

Potential mining and extraction activities in the area can have large socio-economic impacts and can create employment opportunities and increase land values in the area. The area is rich of uranium ore deposits, molybdenum and shale gas. The establishment of the extraction/mining sites will lead to an increase in transport activities for the proposed 400kV power line. Opposition to hydraulic fracturing in South Africa led to the government-imposed moratorium on fracking in 2011. Since the moratorium has been lifted, opposition has

[10] *Source: EIA 2011*

continued. This has led to ongoing debate on what regulations will be imposed, who will enforce them, and how they will be enforced.

4.6 Tourism

The main road networks are often travelled by tourists on their way to the coast. The Klein Karoo has redefined itself as a tourist destination over the last couple of decades. Many guesthouses and lodges can be found along the foothills of the Outeniqua- and Swartberg Mountain Ranges. The N12 is an important link between Beaufort West and Meiringspoort and is much travelled.

According to Domestic Tourism Survey of 2013 from Statistics South Africa, the Western Cape had 2.7 million domestic overnight trips or 9.2% of the total overnight trips (expressed per province as the main destination of overnight trips). More than half (58%) of the overnight trips to the Western Cape were for leisure/vacation/holiday and according to the mode of transport, 77% of all overnight trips to the Western Cape were with a car.

i) George area

There are a number of tourism attractions, including the George museum, Outeniqua Mountains, Montagu Pass (that was declared a National Monument in 1972), Fancourt (National Monument and well-known hotel) and Lake system (Wilderness, Swartvlei, Sedgefield and Groenvlei). The area is host to the George Old Car Show, that was first held in 1997, the George Cheese Festival (since 2002) and the George NAM Sevens Premier League. The George airport was built in 1977 and served 560 432 passengers in 2013, up from 154 000 in 2003.

In the 2014/15 IDP, the George Local Municipality highlights the need to promote the municipality as a sports, tourism and business destination. This includes the re-establishment of a Tourism Bureau, and projects like the Apple Express and the Outeniqua Choo-Choo train project are essential for tourism development in the rural areas. Further tourism opportunities include business tourism, agri-tourism, eco-tourism (hiking, birding, etc) and adventure-tourism potential like paragliding, canoeing, absailing, diving and mountain biking. Strengths also include the natural beauty of the area, the national parks, moderate climate, long sandy beaches and good hotels, guesthouses and restaurants.

ii) Oudtshoorn area

The tourism sector has a high impact on the economy of Oudtshoorn and is estimated that tourism expenditure makes out about 33% of total trading income in Oudtshoorn and up to 16% of the total income for the transport sector.

Tourism attractions include the Cango Caves (Africa's largest show cave system), ostrich farms, wildlife adventures, adventure activities and game lodges. Oudtshoorn is home to the annual Klein Karoo Nasionale Kunstefees (KKNK) (South Africa's biggest Arts Festival), the start of Route 62 wine route and some of the best South African Port style wines are produced in area. Other activities include endurance races like the Cango Marathon and the "To Hell and Back" maintain bike race. The region also includes part of the Swartberg mountain range which is part of the Cape

Floral World Heritage Site (and, as part of the Gouritz Initiative, will soon be part of a major conservation corridor that will link the Klein Karoo to the Indian Ocean).

iii) Prince Albert area

According to the 2011/12 Prince Albert Municipality's Integrated Development Plan, the area has the potential to become a tourism hub to drive the growth and tourism within the Central Karoo region. Tourism has over the last two decades become one of the fastest-growing sectors in the region, with smaller rural communities benefited specifically. According to the IDP, around 1995 there were two guest houses, one hotel and one restaurant in the town. Today, Prince Albert boasts 39 guest houses, a hotel, 10 restaurants and a cooking school, as well as 12 shops catering for the tourist. At present there are 92 members of the Tourism Association, who employ 311 permanent staff, of which 262 are HDI's and of which 46 have been employed in 2009.

iv) Baviaans Area

According to the draft 2015/15 Baviaans Municipality IDP, agri- and eco-tourism form the primary tourism activities within the municipality. Most of the economic activity is centred around the Baviaanskloof World heritage Site as well as along the identified tourism routes, particularly routes T1 and T2. The Baviaanskloof Wilderness Area in the south of the municipality and the Baviaanskloof Mega Reserve covers almost 90% of the municipality area. According to the IDP, a lot of money is spent on the marketing of Baviaans, which results in an annual increase in tourists visiting our area. Tourism at the local municipality contributes to the development of SMME's in areas of Art & Craft Development, hiking trail at Sewefontein, and Leopard Trail in the Western part of the World Heritage site in Baviaanskloof.

During 2015/16 an investigation will be launched to establish a tourism development project on the farm Wanhoop in the Willowmore district.

v) Oudtshoorn Area

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vi) Beaufort West

According to the Beaufort West Spatial development plan (SDP) (2004), Beaufort West has a great geographic advantage in the region (and nationally) since it is located in the northern tip of the Cape Karoo and provide a natural gateway to the

province as well as the Cape Karoo, the Klein Karoo, the Garden Route and many seaside resorts. Beaufort West is geographically also a gateway to the Eastern Cape Province, the Northern Cape Province and the Free State and on the N1 route between Gauteng to the Western Cape. The SDP (2004) mentions that 1 500 cars and 1 000 trucks pass through Beaufort West on an average day and provide a huge source of revenue that has barely been tapped. This figure of cars and trucks would have increased since 2004, but more recent statistics could not be found.

According to the Beaufort West IDP for 2012 – 2017, tourism (together with hunting) is identified as one of the key opportunities in the area. Tourism and Agriculture are currently the two leading regional economic sectors (Beaufort West, Spatial development plan, 2004).

The Karoo National Park, just outside Beaufort West, is the most important tourism facility in the area. According to the Beaufort West IDP (2012 – 2017) this is a national asset which aims to reclaim the original flora of the Karoo and is one of the chief tourist attractions in the region. The Karoo National Park has a wide variety of endemic wildlife. Many species have been relocated to the former ranges, such as black rhino, buffalo, and Cape mountain zebra. There are also a wide diversity of succulent plants and small reptiles. The main entrance of the Karoo National Park is on the N1, close to the existing Droërivier substation.

According to the SDP (2004), hotels, guesthouses, restaurants, filling stations, etc. cater for the needs of travellers along this busy N1 route with a concentration of activities in towns like Beaufort West. There are also numerous examples of historic buildings and museums throughout the area. The Great Karoo is also considered one of the wonders in international scientific circles given the ancient, fossil-rich land11. The area also boasts the largest variety of succulents anywhere on earth with over 9 000 species of plants and herds of plains game in the area.

Travellers visiting Beaufort West are predominantly South African male travellers between 30 and 40 years old that are accompanied by a wife and children. They see Beaufort West as a refuelling place where they can also rest and eat while stopping. The town also has a good ambiance, but visits to tourism attractions are limited due to time constraints. Tourists view Beaufort West as the “Gateway to the Cape”, as “Karoo-Lamb country”, as “Heart of Silence” and as a “good night’s rest”. Perceived major attractions are the “eco-tourism”, the “history”, the “traditional culture” and the “rural lifestyle”. The majority of visitors stay an hour or less and travellers who stay overnight prefer guest houses and B&B’s (Central Karoo Beaufort West Tourism Gateway Research Project Proposal, September 2003).

According to the Beaufort West SDF there were 59 accommodation establishments in the Beaufort West Municipal area in 2004, and this sector is growing at a faster rate compared to other economic sectors. Tourism is a logical way to stimulate general economic growth in the region and can assist in employment generation.

Accommodation facilities in the region include guest houses, game lodges, hotels, B&B's, lodges, cottages (self-catering), budget rooms (self-catering), flats and accommodation in private rooms and farm holiday opportunities.

Beaufort West also has a privatised airport, which is mainly being used for light aircraft for tourism purposes. The airport already has a bed-and-breakfast establishment and has potential for further development.

Some of the world's most important archaeological sites are located in the Cape Karoo, particularly the Beaufort West and Nelspoort areas. This includes a multitude of stone-age sites and Bushmen petroglyths. As a result, the Great Karoo is an important research area to scientists, botanists, archaeologists, geologists, palaeontologists and ecologists. The story of the evolution of mammals from reptiles is here recorded in stone (being 190 to 500 million years old). There are also reptile fossil sites and a small fossil trail at the Karoo National Park. Even though Beaufort West lies in the middle of this fossil rich area, there is no museum of natural history in the town.[12]

vii) Nature Reserves

A number of nature reserves are included in the study area. This includes the Groot Swartberg Nature Reserve, Swartberg East Nature Reserve, Gamkapoort Nature Reserve, Gamkaskloof (Die Hel) Nature Reserve, Kammanassie Nature Reserve, the Doringrivier Wilderness Area, Ruiterbos Nature Reserve, Witfontein Nature Reserve, Gamkaberg Nature Reserve, Susterdal Private Nature Reserve and the Karoo National Park close to Beaufort West.

Due to the inaccessibility of the mountains of the Outeniqua Mountain Range, large parts of this area remained in a pristine natural condition and areas such as Ruiterbos Nature Reserve and Doringrivier Wilderness Area conserves parts of the Outeniqua Mountain Range. The Outeniqua Nature Reserve is located near George and is accessible from Mossel Bay, Knysna and Oudtshoorn. The primary function of this nature reserve is the conservation of water resources.

The Swartberg Nature Reserve is situated in the vicinity of Oudtshoorn in the Swartberg Mountains between the Great and Little Karoo. The Swartberg Mountain Range is protected by the Groot Swartberg Nature Reserve and the Swartberg East Nature Reserve.

The Kammanassie Mountains is currently protected by the Kammanassie Nature Reserve. The Kammanassie Nature Reserve is situated between Uniondale and De Rust. The total extent of the area managed as a conservation area is 49 430 ha of which 21 532 ha is privately owned declared Mountain Catchment Area.

Conservation Areas	**Size**	**Managed by**
Kammanassie Nature Reserve	49 430 ha	WCNCB & Private
Outeniqua Nature Reserve	38 000 ha	WCNCB

[12] *Beaufort West SDP, 2004*

Swartberg Nature Reserve	121 000 ha	WCNCB

A number of Private Game Reserves and Game Farms are located in the study area.

4.7 Heritage

The process has been initiated by engaging **Heritage Western Cape** with a **Notice of Intent to Develop (NID)** to get them on board and request inputs and comments. From the specialist studies, there are no anticipated fatal flaws with regard the construction of the powerline and Alternative 1 is considered the preferred alternative merely because it is shorter, and therefore the impacts are potentially less to archaeological sites. Alternative 1 is associated with an existing line, and therefore a new access/service road to ensure maintenance of the line, will not be required. Findings are summarised in the paragraphs below.

George and Outeniqua Pass: Halkett (1999) surveyed the Gwaing and Blanco corridors linking the Outeniqua Pass and the N2 near George. He reported scatters of ESA and MSA artefacts on the slopes of the Outeniqua Mountains, which were largely under agriculture and therefore heavily ploughed. The sites BCO1 and GWG1 comprise scatters of ESA and MSA material (Figure 3). He found no LSA material but noted that the San and Khoekhoen are reported to have lived in the area. He did not locate any caves along these lower slopes and noted "we saw no possibility for the formation of caves and shelters anywhere along any of the routes".

However, Kaplan (1991) during his assessment for the proposed Outeniqua Pass (a distance of some 20 km over the mountains), reported on seven (7) sites, of which three (3) were rock shelters with rock paintings, one (1) was a stone walled structure (probably a kraal) and three (3) were scatters of ESA and MSA material. He did not observe any archaeological occurrences along the Outeniqua Pass between Blanco and the beginning of Waboomskraal. His sites appear to be concentrated at the junction of the N12 and the R62, but his information is unfortunately not specific enough to allow mapping. The rock art icon in Figure 4 represents the approximate location of the rock art sites.

Uniondale: During his survey for the Outeniqua Wind Farm near Uniondale, Orton (Orton & Hart 2014) recorded only four weathered stone artefacts. He also recorded a number of shelters with rock art in the Outeniqua Mountains (see below). One of the shelters contained some silcrete flakes.

De Rust: Hart (2014) undertook a survey for borrow puts, at the intersection of the Dysseldorp Road and the N12, between Oudtshoorn and De Rust and recorded a light scatter of ESA-MSA stone artefacts conflated onto a Doorbank Horizon. A single small biface, attributable to the Fauresmith, was recorded. The archaeological resources were graded as Grade IIIC. Halkett & Webley (2010) undertook a survey for a housing development on Welgevonden Farm, near De Rust, but some 16 km east of Alternative 1. They reported on some MSA stone artefacts.

Beaufort West: A number of studies have been undertaken immediately south and east of the Droërivier substation for the construction of renewable energy facilities as well as prospecting for uranium. None of the reports (Orton 2011; Halkett 2009; Webley & Hart 2010 and Kinahan 2008) which have been consulted are actually located inside the corridors of the two Alternative powerline options, but they do indicate the range and significance of the archaeology of the Karoo plains to the south-west of Beaufort West.

During his survey at Beaufort West, close to the Droërivier Substation, Orton (2011) reported on scatters of stone artefacts but no clearly defined sites. Most of the artefacts were very weathered and probably dated to the Middle Stone Age. However, a number of fresher flakes were found and these may relate to the Later Stone Age. Nilssen (2014) undertook a Scoping assessment for a solar facility and recorded numerous isolated and very low density scatters of Stone Age implements ranging in age from Early through Middle to the Later Stone Age. Due to their temporally mixed nature and the absence of other faunal or cultural remains, these finds were considered to be of low significance.

Further to the east, studies by Kinahan (2008), Webley & Hart (2010) and Halkett (2009) for uranium prospecting have located a number of archaeological sites. In addition to the scatters of ESA and MSA artefacts, which appear to be ubiquitous across the landscape, Kinahan (2008) notes that the farm Ryskuil is characterized by an almost continuous surface scatter of the full range of archaeological material (ESA, MSA and LSA). The Holocene remains in particular appear to be well defined, mainly occurring at chert and hornfels quarry sites. Similarly Halkett (2009), surveying in the same general area as Kinahan (2008) reported on scatters of ESA and MSA material across the landscape, with LSA sites more rare.

Willowmore: The town of Willowmore was established in 1874 after starting out as a trading centr on the farm “The Willows”.[13] A historical graveyard houses the graves of residents who died during the Anglo Boer War (1899-1902) and the Great Flu Epidemic of 1918. A restored old Boer graveyard is located close to a small gunpowder chamber used during battle to store gunpowder and ammunition.

At Wonderboom a Ghwarrie tree (Eudea undulate) and a Shepherd’s tree (Boscia Oleolides) grow next to each other and two of the three stems of the Shepherd’s Tree have joined together with the third growing through the “eye of the needle”. This tree is situated 12km on the N9 towards Aberdeen.

Hart & Schietecatte (2012) in their assessment for the proposed powerline from Aberdeen to Beaufort West (slightly to the north of the study area), notes that direct assessment of impacts to archaeology and palaeontology can only be assessed and mitigated at the walk down phase. Binneman (2011) reports with respect Willowmore, the presence of only two weathered MSA stone artefacts.

[13] *Baviaans Tourist Guide* www.baviaans.co.za

Rock art

Rock art has been documented in the region since the 1950s by Hym Rabinowitz and others. They include the Cango Caves near Oudtshoorn. More recent rock art research in the southern Cape, including the Oudtshoorn region, is ongoing by Renee Rust (2011), Hugo Leggatt and Kevin Crause. An interesting motif which has caused much debate is the so-called “mermaid” at Ezeljagspoort near Oudtshoorn. Hollman (2005) has interpreted these paintings as representing the swift species of birds. Deacon (1999) removed some graffiti from a cave on the hillside east of Highlands Lodge, Waboomskraal. Kaplan (1991) reported on rock art in shelters near the junction of the N12 and R62 observing a geometric rock art site (OP 1) which has been vandalised because of its proximity to the road; a small panel in a site (OP 2) with human figures and antelope and another small panel in site OP 3 with a small antelope. Orton (2012) reports in his assessment for powerlines to the south of Oudtshoorn, that there is a rock art site on the farm Mist Kraal 169 although he was not able to record it during his survey.

J Deacon (1993) and her colleagues at the National Monuments Council (now SAHRA) cleaned a rock art site at Oude Muragie farm near De Rust. Halkett & Webley (2011) undertook a survey for a housing development on Welgevonden Farm, some 16 km east of Alternative 1 (and De Rust) and recorded a large cave in the mountains with rock paintings and archaeological deposit. Orton (Orton & Hart 2014) also noted the existence of two rock art sites in a line of silcrete cliffs called “Oorvlakte” near Uniondale. He describes human figures and patches of finger dots in one site while the other contains an eland painted upside down.

Figure 28: Typical rock overhang near Uniondale (along the R62) with rock paintings[14]

A number of landowners who have responded during the Public Participation process have indicated the presence of rock art on their farms and their concerns around the potential damage to the art.

[14] *Orton & Hart 2014)*

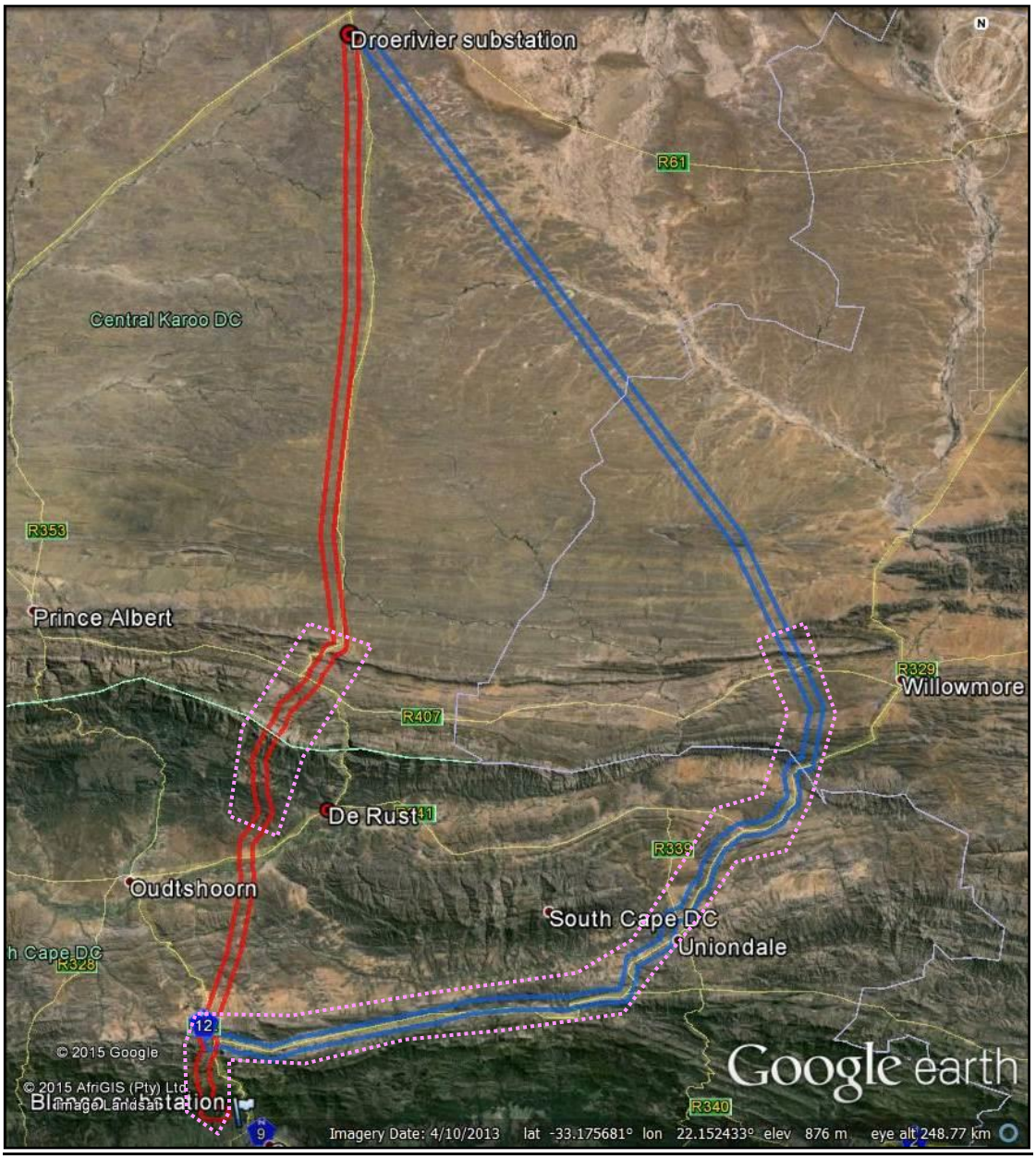


Figure 29: Rock art sites may occur in any mountainous areas or areas of rock outcrops

The pink dotted line in the figure above indicates the area where rock art sites may occur, although the **probability of impacts is higher with Alternative 2.**

Historical Background

The historical background to the towns and villages (Blanco, Waboomskraal, Dysseldorp, De Rust, Klaarstroom, Beaufort West, Rietbron, Willowmore and Uniondale) along the route of the two powerline alternatives are discussed in more detail in the HIA report. Orton & Hart (2014) discuss the potential impact of the proposed Outeniqua Wind Farm on the town of Uniondale including its Provincial Heritage sites, the cultural and natural landscape and scenic routes. During his assessment for a 132 kV powerline linking the Outeniqua and Oudtshoorn substations, Orton (2012) recorded some historical ruins, two historical farm graveyards and

several historical structures. During his survey close to the Droërivier substation at Beaufort West, Orton (2011) reported a scatter of 19th century ceramics and glass. Halkett (2009) mentioned the remains of stone kraals and ruined stone buildings as well as possible farm graves near Beaufort West and Kinahan (2008) also records ruins of shepherd structures (possibly early pastoralist sites), stone kraals, rubbish dumps and farm cemeteries.

Cemeteries and Graves

Formal cemeteries are associated with settlements such as Blanco, Dysseldorp, Klaarstroom, Beaufort West, Rietbron, Willowmore and Uniondale. Farm graveyards may occur in proximity to farm house settlements and many have been recorded during surveys in these areas. Halkett & Webley (2010) undertook a survey for a housing development on Welgevonden Farm, near De Rust, but some 16 km east of Alternative 1 and recorded a large unfenced graveyard on the farm with approximately 50 graves.

Halkett (2013) undertook a survey for a borrow pit near Uniondale and recorded a graveyard and in 2009 Halkett recorded graves on the farm Rystkuil to the south-east of Beaufort West and further graves are recorded by Kinahan's survey (2008) on the same farm. He emphasised the need to an intensive burial survey of the area. The EIA study should consider the full range of recommended options for burial sites, including both site protection measures (preferred option) and possible relocation of the burials.

Palaeontology

The two alternative route options for the Blanco – Droërivier 400 kV power-line both traverse a very wide range of sedimentary rock units of the coastal plain, Cape Fold Belt, Little Karoo and Great Karoo regions.

Route Alternative 1 heads due north from Blanco, crossing the Outeniqua Range and then the eastern portion of the Little Karoo, passing to the west of Dysselsdorp and De Rust. After crossing the Swartberg Range it enters the Great Karoo proper north of Klaarstroom and then runs along the western side of the N12 to Beaufort West. Sectors of potentially high palaeontological sensitivity exist along the Alternative 1 power-line route and include several subunits of the Cape Supergroup, such as Bokkeveld Group bedrocks in the Klaarstroom area plus several narrow outcrop areas of Lower Witteberg Group (Weltevrede Subgroup) and Upper Witteberg Group (Lake Mentz and Kommadagga Subgroups) rocks within the Cape Fold Belt to the north. Karoo Supergroup subunits of potentially high palaeontological sensitivity include Lower Ecca Group rocks north of Klaarstroom, Waterford Formation deltaic sediments in the southern Karoo near Zwartskraal, as well as a long stretch (strip maps 13 to 16) of Lower Beaufort Group rocks across the width of the Great Karoo, from the Cape Fold Belt almost as far as the Great Escarpment near Beaufort West. The Lower Beaufort Group outcrop area here is of particular palaeontological interest because of its rich fossil vertebrates (e.g., reptiles, therapsids) of Middle Permian age that are assigned to the *Tapinocephalus* and *Pristerognathus* Assemblage Zones.

Route Alternative 2 is considerably longer than Alternative 1. It diverges from the latter near Outeniqua Pass and initially heads eastwards along the northern flank of the

Outeniquaberg Range before turning northeast to traverse the eastern end of the Little Karoo, passing by Uniondale. It crosses the eastern extension of the Groot Swartberg Range near Ghwarriepoort and then arcs round to the northwest in the area west of Willowmore. The power-line route then heads in a straight line across the Great Karoo to Beaufort West, passing to the southwest of Rietbron (N.B. The Ghwarriepoort – Rietbron section of the route lies within the Eastern Cape Province).

Sectors of potentially high palaeontological sensitivity include several subunits of the Cape Supergroup, such as Lower and Upper Bokkeveld Group bedrocks to the west of Willowmore area plus several narrow outcrop areas of Lower Witteberg Group (Weltevrede Subgroup) and Upper Witteberg Group (Lake Mentz and Kommadagga Subgroups) rocks within the Cape Fold Belt to the northwest of Willowmore. Karoo Supergroup subunits of potentially high palaeontological sensitivity include Lower Ecca Group rocks northwest of Willowmore, as well as a long stretch (strip maps 10 to 13) of Lower Beaufort Group rocks across the width of the Great Karoo, from the Cape Fold Belt almost as far as the Great Escarpment near Beaufort West. The Lower Beaufort Group outcrop area here is of particular palaeontological importance because of its rich fossil vertebrates (e.g., reptiles, therapsids) of Middle Permian age that are assigned to the *Tapinocephalus* and *Pristerognathus* Assemblage Zones. However, substantial areas of Beaufort Group bedrock here are masked by Late Caenozoic alluvium of low palaeontological sensitivity. Pan sediments to the southeast of Beaufort West are potentially of palaeontological interest.

The Beaufort Group is rich in reptilian, and to a lesser extent, amphibian remains. The Beaufort rocks are internationally famous for its rich record of *therapsid synapsids* (mammal-like reptiles), which mark an intermediary stage in the evolution of the mammals from reptiles. The most abundant herbivores were the anomodonts, whose most primitive forms are also known from the Beaufort rocks.

During the course of the laying down of the Beaufort deposits, the massive end-Permian mass extinction, 251 million years ago, extinguished about 96% of all species alive at that time.[The global event can clearly be seen in the Beaufort rocks. A few members of the genus Lystrosaurus survived this event. With time the Beaufort deposits became more fine-grained once again, probably indicating a recovery of the vegetation in the Karoo, and with it the appearance of a wide range of new species, including the dinosaurs, and true mammals during the late Triassic – early Jurassic.

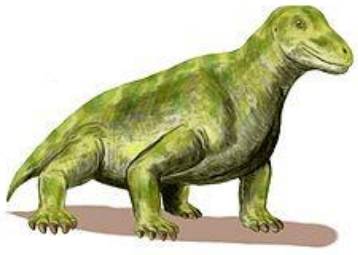


Figure 30: *Moschops (*mammal-like reptile from the Middle Permian of South Africa)

Figure 31: *Lystrosaurus* (most common synapsid after the Permian–Triassic extinction event)

Figure 32: Fossil shells found near Prince Albert[15] (Alternative 1)

Pending field assessment, there is **no preference on palaeontological heritage grounds for either power-line route alternative** between Blanco and Droërivier

4.8 Visual Assessment

4.81 Landscape type: Outeniqua Mountains

The Outeniqua Mountains will be affected by both corridors as it crosses over the mountains from the Blanco Substation site. This approximately a 12 km stretch and also traverses the Waboomskraal Valley.

i) Affected Receptors

The affected landscape features will be small tributaries that originate from the mountains, farm dams and the forested valleys of the mountains. They should be seen as a unit that collectively contribute towards a single visual resource. These features are important as it contributes to the value of the visual resource and any alternation to it could affect the character of the landscape. A section of the line traverses a valley known as Waboomskraal. This is one of the few places where hops are grown in South Africa. It is considered a unique crop in South Africa due to the few places it can be grown and the plants' interesting growth habit. It is uncertain how the transmission line will impact on the hops plantations but it may have an impact on the cultivation patters in the servitude. The affected observers are expected to be the farmers that regularly travel on the dirt roads in

[15] *http://www.rgbstock.com/bigphoto/mf8aWq0/Fossil+Shells*

the Outeniqua Mountains. Protected wilderness areas exist along the crest of the Outeniqua Mountains and possible hiking trails may look down on the Blanco Substation site and the transmission line. It is unclear at this stage where the hiking trails are, but further investigation will follow. The very picturesque Outeniqua Pass (N9) enters the Outeniqua Mountains from the north and winds through the Waboomskraal Valley until it exits on arrival to George. This is a gateway to the Garden Route and considered a scenic route. It is a much-travelled route by tourists visiting the area and is an important transportation connection between the Klein Karoo and George. The visibility analysis and site investigation will reveal if the proposed project will be visible from this route. The N9 section that crosses through the Waboomskraal Valley will also be affected as well as a section of the N12 that joins Oudtshoorn to the N9.

ii) Sensitivty of Receptors

The sensitivity of the visual resource is considered high as this is a region with pristine natural ecosystems. The transmission towers are considered large structures and in contrast with the existing landscape character. Their presence will change the pristine natural character that currently prevails. This will impact on the value of the visual resource.

The hop plantations in the Waboomskraal Valley are a unique agricultural practise in South Africa and the practise of letting the plant creep up a high trellis is considered interesting. Furthermore, the Waboomskraal Valley is surrounded by the Outeniqua Mountains and creates a small basin in which hop is grown successfully. The landscape is considered highly sensitive due to its uniqueness. The residents in the study area are classified as visual receptors of high sensitivity owing to their sustained visual exposure to the proposed development as well as their attentive interest towards their living environment. Tourists are also regarded as receptors of high sensitivity. Their main reason for visiting the area is to experience and enjoy the picturesque and pristine natural environment. They have high expectations in terms of the scenic quality.

The N9 is considered a scenic route and motorists travelling through the mountains are considered highly sensitive.

iii) Distance from Source of Impact

It appears that a couple of farmsteads in the Molen Drift area will be within the Zone of Maximum Visual Exposure, i.e. within 1 km of both proposed corridors. Most other farmsteads are more to the south as the Outeniqua Mountain range is a physical border for any development further north. A couple of dirt roads provide access to this part of the study area but it is unclear who uses the roads. It is presumably the local farmers. The western outskirts of George and the Outeniqua Pass (N9) are within 3-4km of the corridors. The visibility of the proposed project will be assessed on site to determine if these observers will be impacted, and to what degree.

Alternative 1 will affect the N9 through the Waboomskraal Valley and a section of the N12 towards Oudtshoorn as it follows the road infrastructure and crosses over the N12 towards Dysseldorp. Alternative 2 follows the R62/N9 along the northern foothills of the Outeniqua Mountains towards Uniondale for approximately 120 km.

4.8. 2 Landscape type: Karoo Mountains

Alternative 1 crosses over the Swartberg Mountain Range, 12 km west of Meiringspoort Pass (N12). Alternative 2 avoids crossing over mountains in this landscape type but it traverses the Klein Karoo along the foothills of the Outeniqua Mountains and through a gap in the Swartberg Mountain Range between Uniondale and Willowmore. Although it doesn't impact directly on the mountains, it is considered close enough to cause an impact.

i) Affected Receptors

The affected landscape receptors will be small tributaries, valleys and mountain crests. Collectively they contribute to a unique landscape character that is relatively free of anthropogenic structures and consists of pristine environments. These may be impacted when a transmission line traverses over the mountains, or pass in close proximity.

Residents of the area and tourists may utilise dirt roads to travel through the mountains. The terrain is considered difficult to access by roads but small dirt roads might cross the proposed corridors. Tourists visiting the Klein Karoo or passing through the region will be impacted when the transmission line is in their field of view. Tourists may stay over in some of the overnight guest houses or travel on the scenic routes that cross, or follow the proposed corridors. Alternative 2 follows the R62/N9 for approximately 120 km.

ii) Sensitivity of Receptors

The sensitivity of the visual resource is considered high as this is a region with very little anthropogenic elements and is generally free of electrical infrastructure of this scale. The transmission towers are considered large and in contrast with the existing landscape character. Their presence will change the pristine natural character that currently prevails. This will impact on the value of the visual resource. The farming communities in the study area are classified as visual receptors of high sensitivity owing to their sustained visual exposure to the proposed development as well as their attentive interest towards their living environment.

Tourists, such as hikers or people utilising the overnight accommodation, are also regarded as receptors of high sensitivity. Their main reason for visiting the area is to experience and enjoy the picturesque and pristine natural environment. They have high expectations in terms of the scenic quality. It is unclear whether there are hiking trails in the protected areas in the Swartberg Mountains, Kammanassie Reserve and northern slopes of the Outeniqua Mountains. This will be explored during the EIA phase.

iii) Distance from Source of Impact

Alternative 1 will traverse the Swartberg Mountain Range and pass through the Groot Swartberg Nature Reserve. Alternative 2 follows the N9 Route between Uniondale and Outeniqua Pass. It is approximately 3-6 km from the northern slopes of the Outeniqua Mountains. Farmers residing in the area will also be affected due to the corridor passing close to their farmsteads or over their farms. Guest farms and lodges that are within 10 km from the proposed corridors have been identified.

4.8.3 Landscape type: Klein Karoo and Mountain Foothills

Both alternatives traverse the Klein Karoo and the mountain foothills.

i) Affected receptors

Some farming practices such as ostrich farms might be affected. Small tributaries and farms dams will be in the corridor and may be affected. The Kammanassie Dam appears to be the largest dam in this landscape type. Farm residents are expected to be impacted by the transmission lines if it crosses over their farms or near their farmsteads.

Tourists visiting the Klein Karoo or passing through the region will be impacted when the transmission line is in their field of view. Tourists may stay over in some of the overnight guesthouses or travel on the scenic routes that cross, or follow the proposed corridors. Alternative 2 follows the R62/N9 for approximately 120 km.

ii) Sensitivity of Receptors

The sensitivity of the visual resource is considered high as this is a region with very little anthropogenic elements and is generally free of electrical infrastructure of this scale. The transmission towers are considered large and in contrast with the existing landscape character. The residents in the study area are classified as visual receptors of high sensitivity owing to their sustained visual exposure to the proposed development as well as their attentive interest towards their living environment. Residents include farming communities and towns such as Dysselsdorp and Uniondale Tourists are also regarded as receptors of high sensitivity. Their main reason for visiting the area is to experience and enjoy the picturesque and pristine natural environment. They have high expectations in terms of the scenic quality.

iii) Distance from Source of Impact

Dysselsdorp and Kammanassie Dam are within 2 km from Alternative 1. A couple of lodges and guest farms are within 10 km from the proposed corridor. Alternative 2 roughly follows the R62/N9 between the Outeniqua Pass and Uniondale. Motorists and tourists travelling on this route will be confronted with views of the transmission line. A couple of guest farms are located along the foothills of the mountains and are within 5 km from the corridor. Alternative 2 pass 1 km west of Uniondale.

4.8.4 Landscape Type: Groot Karoo

Both alternative corridors will traverse this landscape type.

i) Affected Receptors

The desolate landscape consists predominantly of large farms and is free of large developments. The rural character will be impacted by the introduction of a transmission line. Small rural communities and farm residents are scattered across this landscape type. Roads are mostly dirt roads used by the local farmers. Alternative 1 roughly follows the N12 route between Meiringspoort and Beaufort West. Motorists will be confronted with views of the transmission line.

ii) Sensitivity of Receptors

The residents in the study area are classified as visual receptors of high sensitivity owing to their sustained visual exposure to the proposed development as well as their attentive interest towards their living environment. Tourists are also regarded as receptors of high

sensitivity. Their main reason for visiting the area is to experience and enjoy the picturesque and pristine natural environment. They have high expectations in terms of the scenic quality. There are few tourist attractions in this landscape type. The only guest farm that are identified is Olive Grove Guest Farm 12 km south east from the Droërivier Substation and within 5 km from both alternatives. Motorists are often classified as viewers with a low sensitivity due to their momentary view and experience of a potential visual impact. As a motorist's speed increases, the sharpness of lateral vision declines and the motorist tends to focus on the line of travel (USDOT, 1981). This adds weight to the assumption that under normal conditions, motorists will show low levels of sensitivity as their attention is focused on the road and their exposure to roadside objects are brief.

iii) Distance from Source of Impact

Alternative 1 follows the N12 all the way from Meiringspoort to the Droërivier Substation. For the entire 100 km stretch, the corridor is within 5 km from the N12. A couple of farmsteads are within the ZMVE of both alternatives. Olive Grove Guest Farm are within 5 km from both alternatives.

4.9 Wetlands and Surface Water Bodies

A freshwater assessment was done for the proposed Eskom Project between the Blanco and Droërivier Substations.

The following water features were identified and assessed within the study area:

- Gouritz River System: Upper Gamka River tributaries in the Quaternary Catchments J21A/B/C/E; J23B/D, J32A, as well as the Olifants River and its tributaries in the Quaternary Catchments J31A-D; J32A/E; J33C/E/F; J34A-F; J35B;
- Southern Cape Coastal Rivers: Upper Maalgate River (K30A) and Upper Keurbooms River (K60A);
- Gamtoos River System: Upper Groot/Sout River tributaries in the Quaternary Catchments L11G; L30B; and
- Some valley-bottom/floor wetlands that are largely associated with the rivers as well as some seeps and pans.

The habitat integrity of the rivers range from being largely natural (upper reaches of the larger rivers as well as the smaller streams) to being in the seriously modified ecological state (lower reaches of the larger river systems). The riparian habitat of these rivers tends to be more impacted by the direct impact of the surrounding land use activities which has resulted in removal of the natural indigenous vegetation and the subsequent growth of invasive alien plants. Within the instream habitat, water abstraction and flow modification have the most impact, particularly on the lower reaches.

The wetland areas are predominantly valley bottom wetlands that are linked to the rivers with their ecological condition and importance directly linked to that of the rivers. Some smaller seeps are also located on the mountain slopes of the Outeniqua Mountains that are still in a natural condition. The pans along the Alternative 2 corridor near Beaufort West are considered to be in a largely natural ecological state.

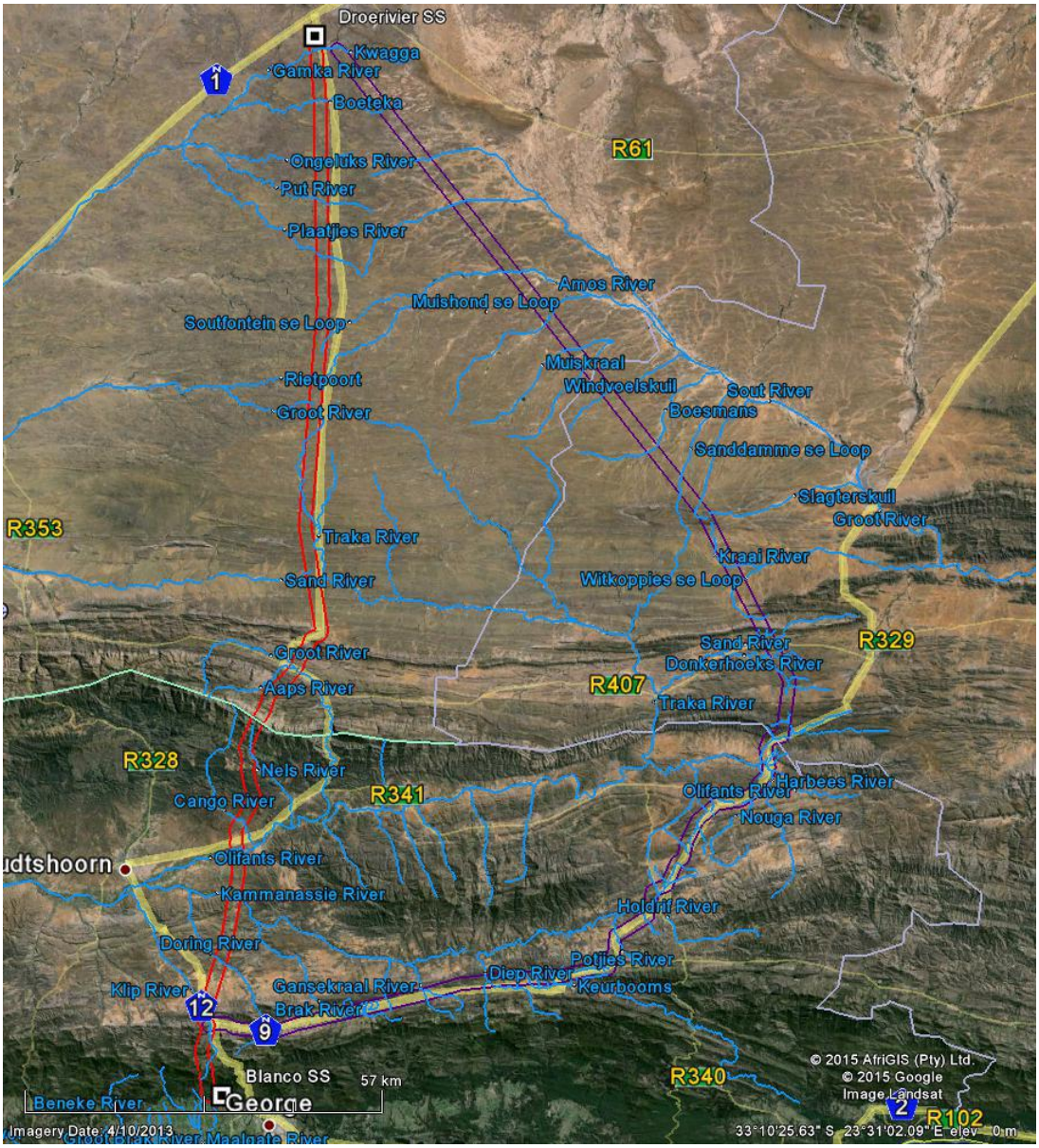
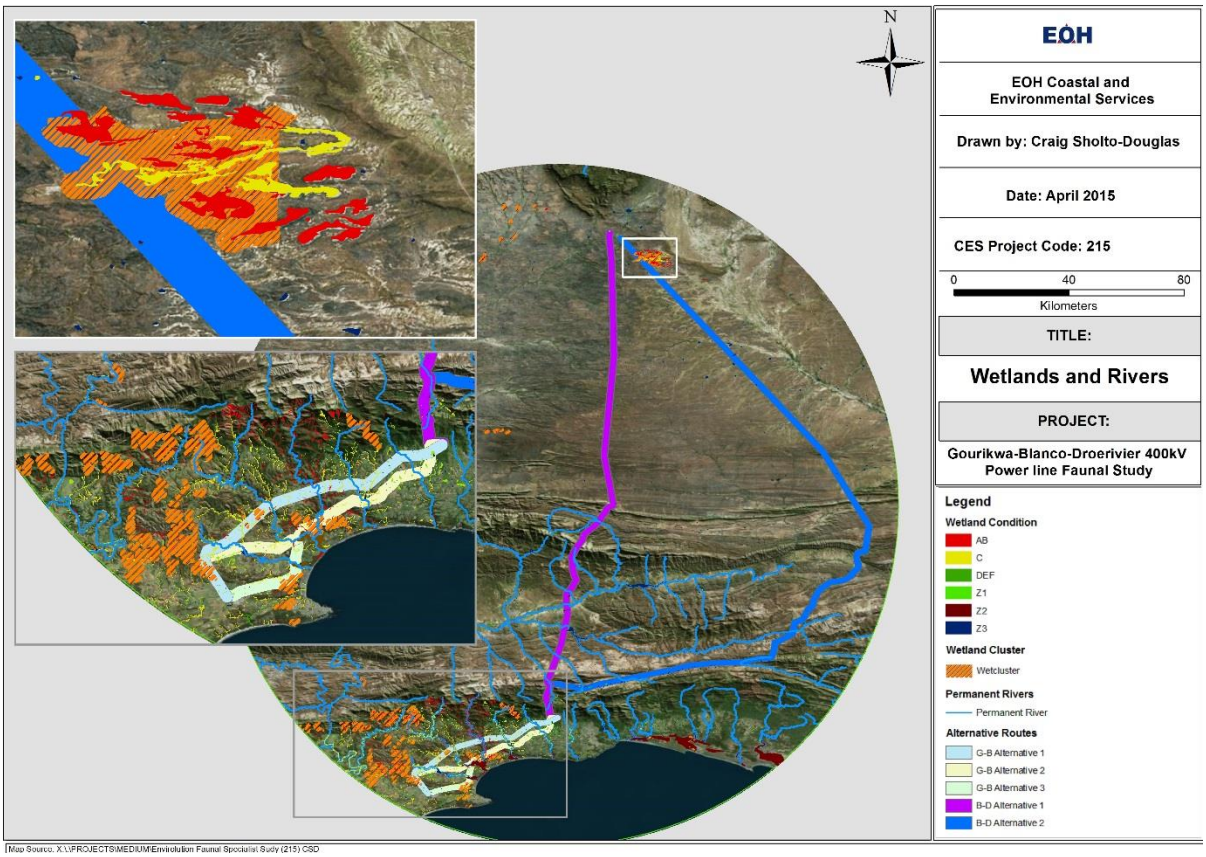


Figure 33. Map indicating rivers along Alternative 1 and 2

Olifants River in particular has been identified as FEPA river and a Fish Sanctuary Area as the river contains populations of an endangered fish species (Small-scale *redfin P. asper).*

The proposed Alternative 2 crosses more sensitive areas such as the many smaller tributaries and associated wetlands of the Kammanassie River in the Little Karoo as well as the large area of pans near Beaufort West. With mitigation, Alternative 1 is likely to have an impact of a very low significance on the freshwater features while Alternative 2 is likely to have an impact of lower significance. The map below shows the wetlands and rivers, and the condition

of the wetlands in the study area. It is clearly noted that the Alternative 2 crosses fewer drainage lines and wetlands.



. **Figure 34. Wetlands and Rivers**

5. DESCRIPTION OF ISSUES AND POTENTIAL IMPACTS

5.1 Identification of Potential Impacts

An important element of the scoping process is to evaluate the issues that were raised during the Public Participation Process (PPP) and technical processes and ensure that those identified as key issues are included within the scope of the EIA process. In addition, scoping allows for the identification of the anticipated impacts, particularly those that will require detailed specialist investigations.

This section of the report aims to predict the potential impacts likely to occur from the undertaking of the proposed activities. The activities that are associated with the construction, maintenance and operation of the proposed power line and substations, which could potentially have an impact on the environment, are also highlighted in this section.

In addition, the Department of Environmental Affairs guide on assessing cumulative effects[16] describes that it is not practical to analyse the cumulative effects of an action on every environmental receptor. Therefore, for cumulative effects analysis to help the decision-maker and inform interested and affected parties, it must be limited to effects that can be evaluated meaningfully. This chapter will highlight potential impacts and issues that can be evaluated.

5.2 Possible Impacts on Topography, Geology and Soils

Topography

The Karoo section of the Alternative 2 alignment has much less dramatic topographic variations than Alternative 1 (that is aligned over the Swartberg Mountains near Meiringspoort) The much longer Alternative 2 was proposed for this reason – to avoid steep mountainous areas that will make installation of pylons and lines problematic and more expensive, but more important – to avoid the visual impact that the infrastructure may have on a UNESCO heritage site, the Swartberg Nature Reserve. In 2004 the Cape Floral Region (of which the Swartberg mountain forms part) was declared the sixth World Heritage Site in South Africa.

Geology and soils

For the southern half of the area, parent material comprises a range of folded sediments, including arenite, shale, tillite and conglomerate of the Cape Fold Mountain Belt. North of the mountains, the underlying material is mainly mudstone and sandstone of the Teekloof Formation, Adelaide Subgroup, Karoo Sequence, along with occasional dolerite intrusions (Geological Survey, 1984). Quaternary alluvium occurs extensively in many of the lower-lying parts in the north-east, but neither route alternative crosses this area.

The terrain along the Karoo section of Alternative 1 and 2 servitudes is relatively flat with gentle slopes in most places, which suggests that slope stability problems are unlikely. Erosion through surface run-off should be insignificant with the exception of areas near watercourses.

[16] *DEAT (2004) Cumulative Effects Assessment, Integrated Environmental Management, Information Series 7, Department of Environmental Affairs and Tourism (DEAT), Pretoria*.

During tower foundation excavation, bush clearing and earth grading will be done in order to provide vehicle access to the towers. Depending on location, this may lead to soil erosion. This will be localized rather than an extended linear disturbance. If in close enough proximity to streams and other water courses, erosion or poor management of stockpiles or materials may impact directly on the river in the form of siltation and pollution. This would be significant should it occur in the streams or other water bodies. Major impacts are anticipated to occur during construction only.

Transported soils are likely to be encountered over large parts of the study area, particularly in areas defined as Southern Karoo Riviere vegetation units. These soils are frequently potentially compressible. Due to the low permeability of both the soil and the underlying rock the transported soils have a tendency to be wet for a relatively long time. Even though these soils may be relatively shallow and overly rock, it will be difficult to traverse the soils during the rainy season with machinery or vehicles. The alluvial soils are transported by sheet flooding and consist of sandy clays and clayey sands which may be expansive.

Rocky areas along the area of Alternative 1 that is proposed over the Swartberg Mountains are expected to complicate the placement of pylon structures. Visual impact in mountainous areas is another concern.

5.3 Possible Impacts on Land Use

The land in the study area is used mainly for small stock grazing due to the climatic and soil constraints. The agricultural potential is relatively low due to the low rainfall, but large areas are dedicated to ostrich, sheep and cattle farming. The areas surrounding Klaarstroom, Kammanassie and Dysselsdorp are sensitive in this regard and placing of pylons would be an issue to be carefully considered. The Waboomskraal area to the West of George supports intensive irrigation farming such as vegetables and fruit.

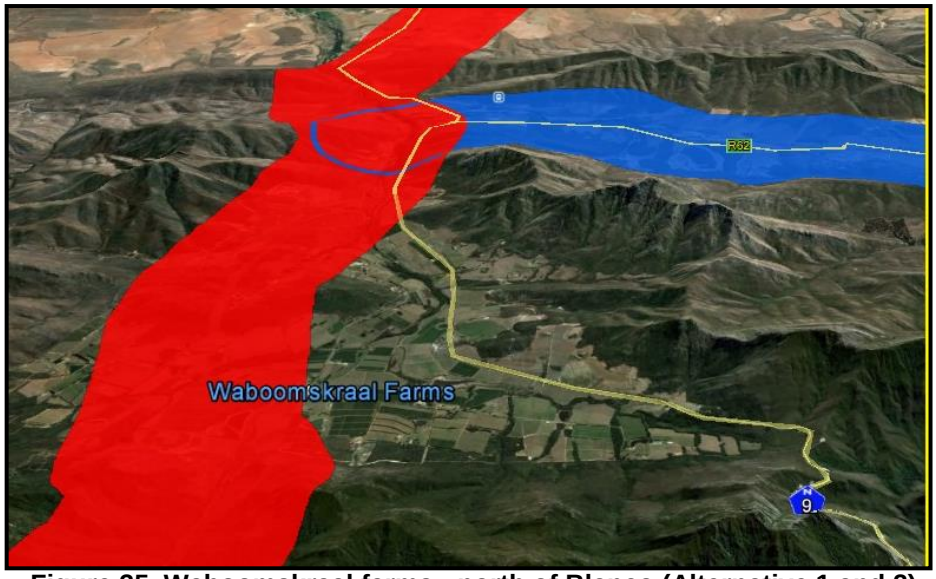


Figure 35. Waboomskraal farms - north of Blanco (Alternative 1 and 2)

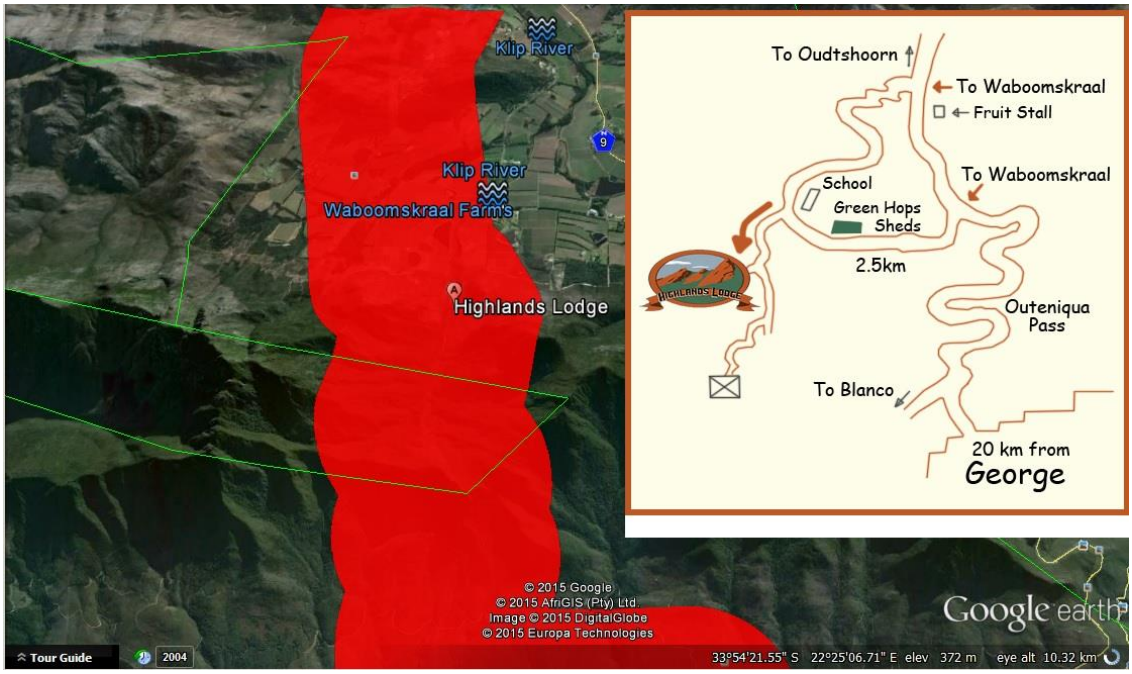


Figure 36. Highlands Lodge near Waboomskraal

Impacts can be expected where the alignment would be in close proximity to the dwellings and/or homesteads of the affected farms. Due to the vastness of the study area and size of the farms in the Karoo in particular, it is however possible that the negative impacts in this regard can be mitigated.

In many instances, limited public and farm access routes exist. Additional access roads would thus have to be constructed even in the case of Alternative 1 which is situated in relative close proximity to the N12. Internal farm roads have been created at great costs for the farmers and were not designed to accommodate heavy construction vehicles. The main negative impact associated with the movement of the construction vehicles is the temporary access roads that would have to be created to enable the vehicles to access the actual construction areas. Heavy vehicles transporting the pylons could thus result in increased risk of accidents, dust creation, degradation of local roads and possible erosion. As this would result in severe negative intrusions on the private properties and possible environmental degradation (e.g. damage to veld and erosion), an intensive consultation process with property owners during the negotiation phase and prior to the construction of these roads would be critical. Property owners could provide valuable information with regards to the sensitivities of their land and the best routes for the access roads.

Existing Eskom access roads (for the distribution lines) are said to have already create erosion (e.g. animals walking along these tracks creating permanent unwanted paths). With the limited roads and road infrastructure currently present in the study area, and the existing experience with Eskom's access roads, such heavy construction vehicle movement and new access roads, whether temporary or permanent could result in severe negative impacts on previously unspoilt areas and could create further erosion problems. This impact is possible along both Alternatives. The significance of the impact will be assessed during the EIA phase.

At this stage a limited impact on existing infrastructure and services are anticipated during the construction phase. Existing road crossings are limited and are expected to successfully respond to project management and mitigation measures. Care should further be taken to avoid placing towers within the water furrows made by property owners, and to take cognisance of farmer's planning where pivot points are concerned. The property owners of the farms at Alternative 1 in the vicinity of George have indicated that the centre pivot irrigation system on their farms would be initiated or expanded. The line alignment should thus take this in consideration and should avoid having any impact on such possible farming activities and infrastructure.

Maintenance activities would be undertaken only when required for the life of the line. It is not anticipated that this would have severe negative intrusions on the landowners, mainly due to the size of the affected properties (lines could be situated far away from homesteads and other dwellings) and the fact that stock farming activities such as grazing could continue underneath the proposed line and within the servitude. However, complaints were received during the PPP process (March-April 2015) regarding the maintenance of power lines. Issues include the following:

- The need for additional access routes which could result in erosion, intrusion, loss of land;
- Maintenance personnel leaving gates open;
- Maintenance personnel driving on private roads without obtaining permission first;
- Maintenance personnel driving through the veld;
- Littering during construction and maintenance;
- Maintenance personnel accessing properties without prior notification and
- Illegal capturing or poaching of game and other livestock and theft of plants.

The effects of misconduct such as those mentioned above could result in long-term secondary negative impacts with possible negative financial implications for farmers and damage to the environment. For the maintenance activities of the line, proper conduct and mitigation measures could address the possible negative impacts.

Operations at the substation are anticipated to be of a low input and are thus not expected to negatively impact on the daily living and movement patterns of the affected residents. Access to the substation already exists, thus it is anticipated that the existing status quo at the substation would continue.

Typical agricultural activities undertaken in the study area refer to sheep and goat (Angora, Boer Bok) farming, cattle farming, hunting, lucern production and crop production (vegetables & fruit e.g. strawberries). During the construction phase, the possibility of stock losses due to theft and/or poaching, increase in noise and the actual construction activities placing stress on the animals, would remain of concern. Livestock should thus be moved away from the construction activities and/or be fenced off. This could intrude on the implementation of the rotational grazing system used by farmers.

On various properties in the area, the farmers created stock watering dams. Due to the arable land, the farmers' are dependent on these systems, in addition to the groundwater for their subsistence, livestock and irrigation needs. It is important to avoid negatively impacting on the water berms with the tower footprints and/or servitude alignment. The maximum distance between towers for a 400 kV transmission line varies from 350 metres to 400 metres and it might thus be possible to span these berms.

As sheep farming can be seen as the main agricultural activity in the study area, the impact of the transmission line and towers, once operational, on the land-use would be limited. Farming of sheep could continue undisturbed as the animals are allowed within the servitude. Should possible negative impacts occur in this regard, the study area lends itself to mitigation through re-routing of the alignments in such areas.

The proposed project (Alternative 1 and 2) is located to the south of Beaufort West and thus will not impact upon the town itself however, farming activities in the area of the Droërivier substation should be kept in mind when the proposed power lines are erected.

Due to the location of the Blanco (Narina) Transmission substation to the north of George, the proposed project (both alternatives) should not impact upon the town itself however, cultural/heritage value of the Blanco area should be kept in mind when the proposed power lines are erected.

The proposed project (Alternative 1) is located in close proximity to the town of Klaarstroom and the farming and cultural/heritage (tourism) value of the town should be kept in mind when the proposed power lines are erected. Discussions with local residents and farmers were held during the Public Participation Process.

5.4 Impacts on flora and vegetation ecology

All three alternative routes intersect vegetation types that are regarded as threatened on a national and regional level and vegetation types that contain threatened plant species. Alternative 3 intersects the most Critical Biodiversity Areas, for which the land use recommendation is not to disturb any remaining natural vegetation and to retain important ecological processes (Pence, 2014). I hence propose that Alternative 3 is rejected at this early stage, with only Alternatives 1 and 2 being subjected to more detailed field studies.

It is not possible to find a route between the two ESKOM sub-stations that needs to be linked which will not intersect threatened vegetation types or Critical Biodiversity Areas. Alternatives 1 and 2 are reasonable options that should be investigated in further detail to determine the exact extent of their impact on extant natural vegetation and the occurrence of threatened plant species. The impact of the proposed approximately 100 m wide corridor development will mostly be;

1. High negative impact at a limited scale at the points where pylons will be located. Here the occurrence of threatened plant species should be considered.
2. High negative impact along new access routes that will have to be established to establish and service the power line. Here the occurrence of threatened plant species should also be considered.
3. Moderate negative impact along the entire route where it intersects flammable vegetation (mostly Renosterveld and Fynbos) as the vegetation will be slashed periodically to reduce fuel loads under the power line. Here the impact of disturbance of the proposed development on the remaining intact vegetation should be carefully considered.

4. Potential positive impacts of the proposed development are mostly limited to areas where alien vegetation will be cleared along the route.

A detailed field study may find mitigation actions that will limit the negative impacts of the proposed development along either alternative 1 or 2. Such a field study must establish;

- The true ecological condition of the vegetation along the two alternatives, especially within the mapped Critical Biodiversity Areas.
- The occurrence or potential occurrence of threatened plant species along the two alternatives.
- Sound mitigation actions to ensure that the establishment of the power line will have a minimal negative impact on sensitive vegetation and threatened plant populations.

5.4.1 Impacts on indigenous natural vegetation

Potential impacts on vegetation ecology and flora may include:

- negative change in conservation status of habitat;
- increased vulnerability of remaining portions to future disturbance;
- general loss of habitat for sensitive species;
- loss in variation within sensitive habitats due to loss of portions of it;
- general reduction in biodiversity;
- increased fragmentation (depending on location of impact);
- disturbance to processes maintaining biodiversity and ecosystem goods and services; and
- loss of ecosystem goods and services.

5.4.2 Establishment and spread of declared weeds and alien invader plants

Exotic species are often more prominent near infrastructural disturbances [17] [18] than further away. Consequences of this may include:

- loss of indigenous vegetation;
- change in vegetation structure leading to change in various habitat characteristics;
- change in plant species composition;
- change in soil chemical properties;
- loss of sensitive habitats;
- loss or disturbance to individuals of rare, endangered, endemic and/or protected species;
- fragmentation of sensitive habitats;
- change in flammability of vegetation, depending on alien species;
- hydrological impacts due to increased transpiration and runoff; and
- impairment of wetland function.

5.4.3 Fragmentation of sensitive habitats

Fragmentation may occur if vegetation is completely cleared below the power line, which does not appear to be the case in the study area where grasslands occur. It is therefore assumed that no clearing will take place and that localized fragmentation may only occur where access roads are required to be constructed.

[17] *Gelbard & Belnap 2003*
[18] *Watkins et al. 2003*

5.4.4 Possible impacts on Fauna and Avifauna

i. Fauna

Relatively small, localised areas of fauna will be affected by the development, which will be restricted to the servitude of the power line and access to it. Of significance, are the sites situated closer to ecological habitats such as wetlands and surface water bodies. Impact on these ecologically sensitive areas can be minimised through the correct location of towers and access roads beyond their boundaries.

Most of the study area consists of karroid scrub and grassland (Colloty, 2012[19]) with little spatial heterogeneity available to support a diverse composition of mammals. Species expected to be present include *Cryptomys hottentotus* (Common Mole-rat), *Cynictis penicillata* (Yellow Mongoose), *Suricata suricatta* (Meerkats), *Lepus saxatilis* (Shrub Hare), *Hystrix africaeaustralis* (Cape Porcupine), Steenbok (*Raphicerus campestris*) Common Duiker (*Sylvicapra grimmia*), *Canis mesomelas* (Black-backed Jackal) and Murid rodents pertaining to the genera *Rhabdomys* and *Otomys*.

Observations in the area have shown that the region has sufficient food resources to support the small carnivore species such as the Black-backed Jackal and Cape Fox, as evidenced by the frequent occurrence of these species along road networks.
Several bat species may also occur in the study area, although during a drive through during the Scoping phase by the specialist, potential habitat such as tree holes, barns/ruins or permanent expanses of water was found limiting. These will be further investigated during the EIA phase.

Brown Hyaena (*Parahyaena brunnea*) which are “Near-threatened” have a wide distribution range, which is an indication of a wide habitat tolerance, throughout South Africa. At the present time they are found mainly in large rural areas not typified by intensive cultivation or urbanisation. The status of this species on the study sites remains unclear and should be determined during the EIA phase of the project.

ii. Avifauna

Impacts on birds, pose probably the greatest threat for fauna and will also be associated with not just the construction, but also with the operation phase of the project. The impacts will include habitat destruction during access road construction and establishment of temporary camps. During such activities, normal bird behavioural patterns are disrupted. Electrocutions and collisions are amongst the biggest threat posed by overhead power lines in Southern Africa.

The most important avifaunal issue that was assessed during the EIA phase was to find an acceptable alignment that will be both technically feasible and environmentally least damaging. An alignment that avoids as much as possible of the remaining grassland and wetlands (if possible) would be the most acceptable. For this assessment, a walkover of both alternatives for this project was done by the Avian specialist.

[19] *Scherman Colloty & Associates. 2012. Draft Scoping Study Report. Eskom Droerivier Blanco Transmission Line, Aquatic And Terrestrial Ecological Assessment.*

Figure 37. Bird mortalities (Blue crane, Owl) found below power lines (April 2015)

The Specialist Report has listed the following avian impacts associated with transmission power line:

- Collisions with associated power line infrastructure.
- Electrocution on associated power line infrastructure.
- Nesting on associated power line infrastructure.
- Disturbance through construction and maintenance activities of new power line.
- Direct interaction in which the bird comes into physical contact with the power line infrastructure.
- Indirect interaction includes disturbance or habitat destruction as a direct result of construction and maintenance which could have a negative impact.
- The design of the transmission line and associated pylons also has a bearing on the risks to certain avian species. The earthing conductors are one of the biggest risks as it is thinner than the transmission conductors and therefore not as visible to birds in flight. Bird excreta on the infrastructure can also have a negative impact on the transmission lines causing possible power interruptions.

- Electrocution of birds on pylons will depend on the particular design of the pylon to be utilized for the project, the risks to the birds is determined by the phase to phase and phase to earth clearances.
- Nesting and roosting of birds on pylon structures can have a positive impact on avifauna, but it could also have a negative affect by causing electrical faults due to added weight, shorts due to excreta and possible fire risks from nesting material.
- Avian species that are most consistently affected by over head transmission lines are water birds that congregate at wetlands and commute between them in flocks, examples being large and / or fast flying species examples such as ducks, geese, flamingos, storks, herons and waders, which have a high collision rate. Game birds and rails have less exposure but are still highly susceptible. Canes, storks, bustards korhaans which are large heavy bodied, flocking and low flying are also highly susceptible to collisions with over head transmission power lines.

Recommendations have been made in the Avian Specialist Report regarding mitigation of impacts.

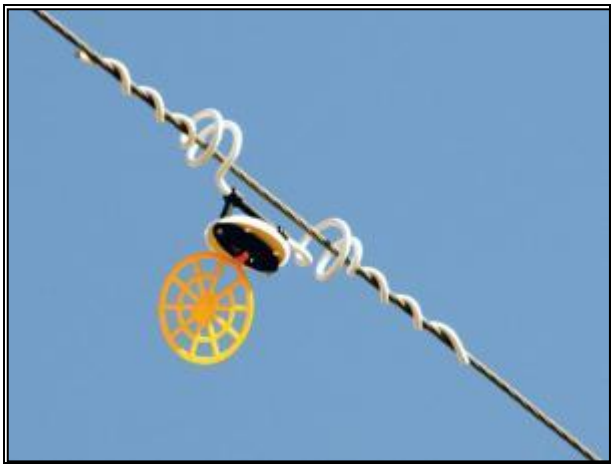


Figure 38. Bird flappers proposed as mitigation measures

5.5 Possible impacts on Wetlands and Surface Water Bodies

Construction may lead to some direct or indirect loss of or damage to seasonal wetlands or drainage lines. This will lead to localised loss of wetland habitat and may lead to downstream impacts that affect a greater extent of wetlands or impact on wetland function. Where these habitats are already stressed due to degradation and transformation, the loss may lead to increased vulnerability (susceptibility to future damage) of the habitat. Physical alteration to wetlands can have an impact on the functioning of those wetlands. Consequences may include:

- Increased loss of soil;
- Loss of or disturbance to indigenous wetland vegetation;
- Loss of sensitive wetland habitats;
- Loss or disturbance to individuals of rare, endangered, endemic and/or protected species that occur in wetlands;
- Fragmentation of sensitive habitats;
- Impairment of wetland function;

- Change in channel morphology in downstream wetlands, potentially leading to further loss of wetland vegetation;
- Change in runoff and drainage patterns; and
- Reduction in water quality in wetlands downstream of road.

The specialist study that was conducted by Blue Science (June 2015) stated that it is often the access roads associated with the transmission lines that are likely to have a greater impact on the freshwater features than the power lines themselves as the lines can usually span the freshwater features such that the pylons can be constructed outside of the rivers and wetland areas as well as their recommended buffer areas, whereas the roads need to be constructed through the freshwater features. It is thus often best if the new power lines are placed adjacent to existing lines or roads where new roads do not need to be constructed as part of the project.

With the potential impacts of the proposed activities, it is often the access roads associated with the transmission lines that are likely to have a greater impact on the freshwater features than the power lines themselves as the lines can usually span the freshwater features such that the pylons can be constructed outside of the rivers and wetland areas as well as their recommended buffer areas, whereas the roads need to be constructed through the freshwater features. It is thus often best if the new power lines are placed adjacent to existing lines or roads where new roads do not need to be constructed as part of the project.

Water resources are scarce in the Karoo region, but as a whole, the shorter Alternative 1 has the potential to impact on fewer of the freshwater features within the study area. Should this alignment be selected, a localized shorter term impact of moderate to low intensity (depending on the distance between the construction activities and the freshwater features) with a low overall significance. Water Use License Applications (WULAs) will have to be made to the Department of Water and Sanitation (DWS) for authorisation before construction can commence.

Most of the freshwater features within the proposed corridors are already in a modified ecological state as a result of the existing land use activities. The proposed lines are in general proposed along routes where there are already power lines in place. Provided the new lines are constructed close to these lines such that the associated access roads can be shared, the cumulative impacts are likely to be low.

Erosion and sedimentation from the project activities, together with invasive alien plant growth and the possible modification of surface water runoff and water quality may lead to additional impacts on the freshwater habitats within the study area. In general, by selecting the route with the least impact, one can prevent any unacceptable impacts, particularly over the longer term, from taking place within the freshwater features within the study area. These impacts are likely to be of a low significance and can be monitored and easily mitigated.

In terms of the selection of the route selection for the transmission lines, it is recommended that a buffer of 50 from the top of the river banks; approximately 100m from the edge of the wetland areas and 500m from the pans be allowed for as a development setback for the construction of the pylons.

Figure 39. **Likely impacts of the alternative powerline routes on wetlands and rivers**

Route	Comment
B-D Alternative 1	Alternative 1 avoids major wetlands and wetland clusters. Although the route crosses many perennial rivers south of the Swartberg, these rivers are all large and generally fast flowing. Therefore, it is unlikely that over-head power lines crossing the river will have a significant impact on amphibians.
B-D Alternative 2	This route crosses many pristine wetlands and wetland clusters according to NFEPA, which provide suitable habitat for amphibians. This alternative option is likely to have a significant impact on amphibians.

The corridor with the least potential impact on the freshwater features in the area is likely to be the more direct route (Alternative 1) as it would need to cross fewer rivers than the route. In addition, it would avoid more sensitive areas crossed by the Alternative 2 corridor such as the many smaller tributaries and associated wetlands of the Kammanassie River in the Little Karoo as well as the large area of pans near Beaufort West. The alignment of the route within the corridor could also be determined to minimise the potential impact on the freshwater features within the study area. With mitigation, Alternative 1 is likely to have an impact of a very low significance on the freshwater features while Alternative 2 is likely to have an impact of a low impact.

A water use authorization may need to be obtained from the Department of Water and Sanitation: Western Cape Regional Office for approval of the water use aspects of the proposed activities.

5.6 Possible Heritage Impact

Various cultural and heritage resources exist in the study area. The risk of archaeological features such as graves and old infrastructure such as farmsteads, bridges and wells do exist and could result in the removal or damage of these resources during construction of access roads and towers or during the establishment of camps.

A site visit will be conducted during the EIA phase for the project, where more detail related to heritage resources may be identified. The most prominent heritage resourse would be the Swartberg Pass and certain items such as the Eerstewater Convict Station, Blikstasie Convict Station, the Ou Tol, the ruins of the Hotelletjie (little hotel), ruins of the Stalletjie (little stable), and the dry stone walls.

There are no anticipated fatal flaws with regard the construction of the powerline. The Heritage desktop review has concluded that there are no archaeological reasons to exclude the use of either of the proposed powerline alternatives. However the Swartberg Mountains are of particular relevance to Alternative 1, and thus to avoid the possible impacts on this area**, the (much longer) Alternative 2 has been proposed**.

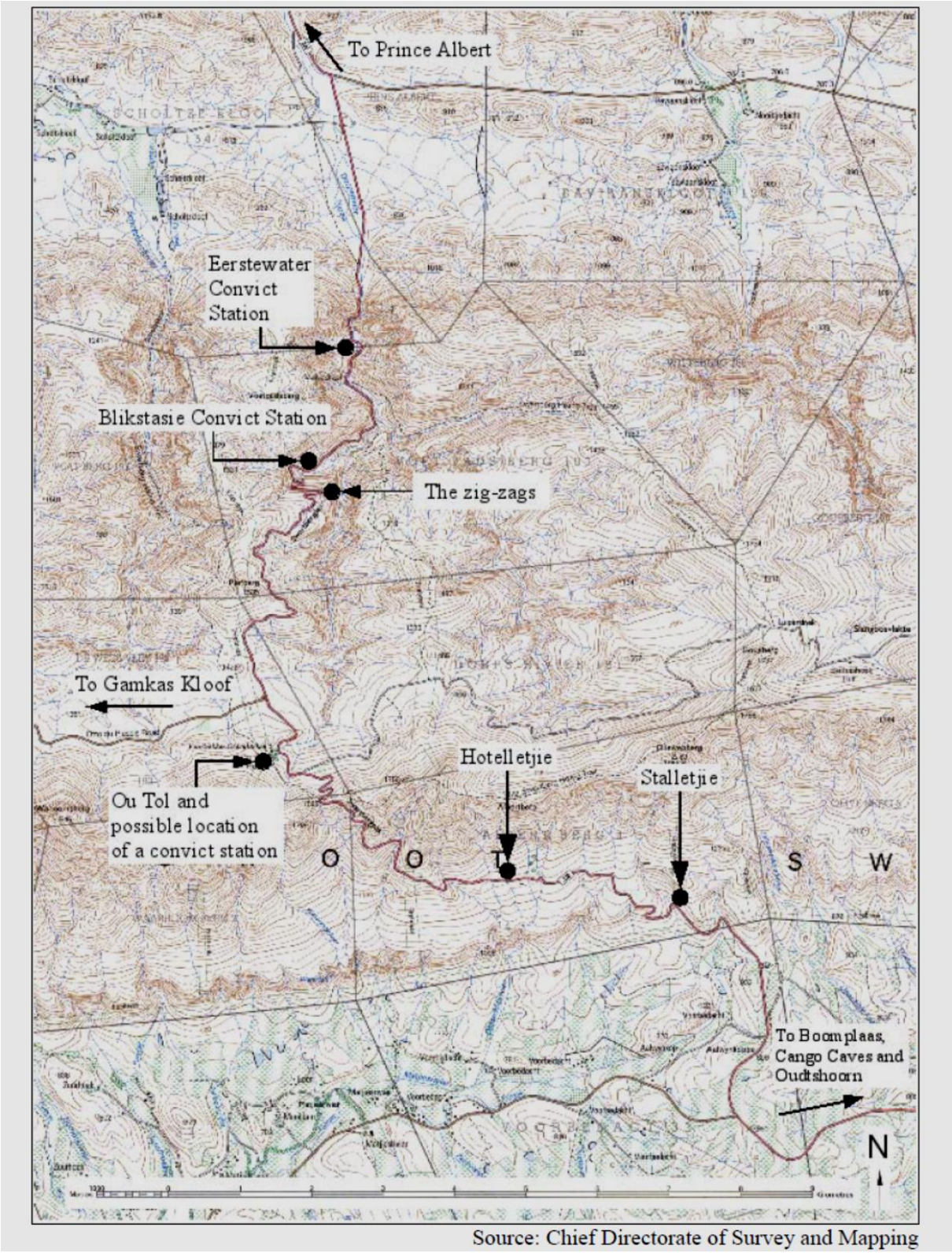


Figure 40. the location of prominent heritage resources of the Swartberg Pass

Impact on Pre-Colonial Archaeology

Since heritage sites, such as archaeological sites, are non-renewable, it is important that they are identified and their significance assessed prior to development. The main cause of impacts to archaeological sites is direct, physical disturbance of the material itself and its

context. The significance of an archaeological site is highly dependent on its geological and spatial context. This means that even though, for example a deep excavation may expose buried archaeological sites and artefacts, the artefacts are relatively meaningless once removed from the area in which they were found. The impacts are likely to be most severe during the construction period although indirect impacts may occur during the operational phase of the project. It is possible that the pylon footings may impact directly on surface and below-surface archaeological remains. However, previous surveys, inland of the coast, have not identified any significant archaeological remains. A targeted survey at the walk-down phase can address these issues.

Impact on Colonial Period

The construction of pylons in close proximity to farmsteads, may result in the destruction of historic rubbish dumps (middens), old kraals or the ruins of old dwellings. For this reason, a targeted walk-down of the line will be required after the final powerline route has been decided.

Impacts to Graves

The pylons may be constructed on/or in close proximity to farm graveyards. A survey during the walk-down phase can address these issues.

Human remains are the most complicated aspects of heritage to mitigate since they require their own public participation process (See Section 36 of the NHRA) before they can be exhumed. Human remains are protected by a plethora of legislation including the Human Tissues Act (Act No 65 of 1983), the Exhumation Ordinance of 1980 and the National Heritage Resources Act (Act No 25 of 1999). In the event of human bones being found on site, HWC must be informed immediately and the remains removed by an archaeologist under an emergency permit. This process will incur some expense as removal of human remains is at the cost of the developer. Time delays may result while application is made to the authorities and an archaeologist is appointed to do the work.

5.7 Possible Visual and landscape Impact (see specialist VIA study in Appendix 4.10)

Visual and aesthetic impacts will result from the construction activities of excavation, erection of towers and transporting of materials. In most areas the construction activities will however be of short duration.

The study area includes landscape features that contribute to a highly valued visual resource in specific regions. Outdoor recreational activities and the tourism industry, latches on to the opportunities the visual resource offer. Many activities and industries are specifically located in areas of pristine natural landscapes or at points where scenic views can be experienced.

The Klein Karoo has managed to redefine itself over the last couple of decades to become a tourist destination. Festivals such as the Klein Karoo Arts Festival have reached enormous popularity and draws people from all over the country. Focus has been placed on the unique agriculture industry in the region and ostrich farming is now synonymous with the Karoo region. In addition, the hop plantations in the Waboomskraal Valley are just as unique and contribute to a specific landscape character.

The study area consists of many different landscape types, each with its unique character and areas of very high scenic quality. The natural pristine mountain ranges provide a picturesque backdrop to almost every view. Even the furthest northern part of the study area still enjoys views of the Swartberg Mountains in the distance, or the mountains in the Karoo National Park, north of Beaufort West.

The transmission line is considered a large-scale project and will be in contrast with the existing landscape characters that have been identified in each landscape type. This can potentially impact on the tourism industry and affect observers' perceptions of the study area.It can be expected that a 400 kV transmission line, which traverses the Nama Karoo landscape and Swartberg Mountains will cause a significant visual impact. Once in place the power line will have an aesthetic/visual impact, which can only be mitigated through careful route selection.

5.8 Possible Impacts on Protected Areas

A number of formally protected areas occur within the Outeniqua Mountains (Witfontein Nature Reserves and the Doringrivier Wilderness Area) and in the Groot Swartberg Mountains (Groot Swartberg Mountain Catchment Area, Swartberg East nature Reserve, Kammanassie Nature Reserve and the Baviaanskloof Nature Reserve east of Willowmore).

The Karoo National Park is also located just north of Beaufort West. An important concern related to Alternative 1 is the line that would have to cross the Groot Swartberg Nature Reserve, near De Rust. Should Alternative 1 be the preferred alignment for the development, it will be important to ensure that the visual impact of the transmission power line and tower structures is mitigated where it crosses the Swartberg Mountain area, since the pass was declared a National Monument and is placed in a relatively pristine environment.

Results from the visual impact study can be used to limit the impacts of the transmission lines in or near to protected areas. One of the ways can be to let the major section of the transmission lines run parallel to the N12 road (Alternative 1). This is also the shortest route.

Figure 41. One of the hiking trails in the Swartberg Nature Reserve

5.9 Possible Tourism and Economic Impact

i. Tourism impact (included in specialist Socio-ecoonomic study in **Appendix 4.4**)

The impact of the proposed transmission lines on the tourism areas needs to be assessed within the context of "sense of place" taking into consideration the visual impact (and visual impact study). It seems as if most tourists visiting the study area will either do so from the N1 in the North, from Beaufort West or Prince Albert or from the South from George (either via the airport, or via the N2 (east or west).

One of the reasons tourists' visit the Great Karoo is for the "wide open horizons" and "rural lifestyle" to "escape from the city life"[20]. Given the "sense of place", it could be considered from a tourism point of view, to keep the selected route as far as possible along the existing transmission lines or other man-made corridors, like the N12 (Alternative 1). The visual impact study can also provide important insight with respect to this. A concern with Alternative 1 could be crossing of the Groot Swartberg Nature Reserve and it is advised to get insight from the Heritage impact assessment study on this. The visual impact study can also provide important insight with respect to this issue.

The George municipal area is part of the Garden Route with scenic mountains, farms, forests and valleys. Tourists also visit the Groot and Klein Karoo area to experience the rural lifestyle

[20] MasterQ Research, (Petrich, 1993).

and open spaces without the visual interference of transmission lines. Results from the visual impact study can be used to limit the impacts of the transmission lines. One of the ways can be to let the major section of the transmission lines run parallel to N12 (Alternative 1). This is also the shortest route.

Figure 42. Accommodation “Keurfontein Country House” (Alternative 2)

The Baviaanskloof World Heritage Site and Wilderness area is to the east of the proposed Alternative 2, but is in relative close proximity of the towns of Rietbron and Willowmore. As an example, the Keurfontein Country House is situated on the N9 between Willowmore and Uniondale. The facililty has two dams that are fed from a fountain in the mountain, and it’s marketing stategy for tourism is that “Guests will enjoy the clean Karoo air, starry nights and mountain views”. The visual impact of any proposed power line in close vicinity to this and other similar establishments would need to be minimised.

ii. Economic impact **(included in specialist Socio-Economic study in Appendix 4.4)**

The impact of the construction of the transmission lines on the economy includes the impact of the construction cost, the operational expenditure and the impact on the broader economy (by allowing the power to be delivered to the existing grid). Capital expenditure data could not be obtained from Eskom to quantify any impacts, but a number of expenditure categories are discussed. A number of components will have to be imported from other provinces into this region, like steel structures, cables, hardware, insulators and cement. This will generate economic activity and employment opportunities in those provinces. A local procurement policy can also be considered by Eskom (where possible and if not already standard practice) on activities like site clearance, road building and assembling to maximize the economic and job creation impact on the local municipalities.

The transmission lines will have some, although a limited impact on the agricultural activity, given the grazing capacity and that grazing can continue under the transmission lines. The operational expenditure will have limited opportunity for employment creation. From an economic point of view, with cost savings in mind, the shortest route, i.e. Alternative 1 can be recommended.

From a practical point of view, it should be noted that Meiringspoort is subject to regular flooding during rainy seasons (winter months) which could impact on any vehicles transporting material to the sites for the construction of the Alternative 1 alignment. Meiringspoort is characterised by ravines, narrow river passages with a winding road that would make it impossible for heavy vehicles to transport materials on without impacting on traffic flow.

The direct operational expenditure of the transmission lines will mainly include the maintenance of infrastructure and access roads to the transmission lines. This will potentially have very limited employment creation opportunities in the local area as existing operational teams can typically pass through once a year to inspect the infrastructure and perform maintenance where needed. Given the low rainfall in the Groot Karoo sections, access roads will only need maintenance on an ad-hoc basis. Local teams can be used for this. Maintenance on Alternative 1 will also be easier given that it is a shorter route and that the larger section of this route is parallel with the N12. This is compared to Alternative 2 where the section from the N9 to Droërivier (about 114 km) is not close to any major routes.

From an economic point of view, Alternative 1 will be preferred given that this is the shortest option and least expensive option to build and maintain. It will also have the least impact on agricultural activities. However, as mentioned earlier, a concern with Alternative 1 can be the crossing of the Groot Swartberg Nature Reserve (a World Heritage Site) and it is advised to get insight from the Heritage Impact Study on this.

5.10 Potential socio-economic impacts (see specialist study in Appendix 4.4)

According to Kevin Leask[21], "The most economical way to build power transmission infrastructure is in a straight line from the source of the power to those who need it". However, it is important to "…take account of social, environmental and heritage concerns".[22]

According to Eskom (2014), it costs about **R2.8 million per km** for a 400 kV transmission line (depending on terrain, types of structures required, etc). As a result a transmission line of 178 km can cost about R498 million compared to a line of 270 km that will be about R756 million.

The impact of the construction of the transmission lines can be subdivided in two categories. One is the impact of the construction cost, purchasing of servitude and operational expenditure of the transmission lines on the surrounding local municipalities and secondly the impact on the broader economy by strengthening the power availability to a growing economy. It is expected that the construction of the proposed transmission lines and the upgrading to the existing substation can take up to 24 months. No potential average construction cost or potential land value information was available at the time of this study and as such no potential impacts could be quantified. Potential costs categories that are encountered during the construction phase (capital expenditure period) are:

- Civil engineering costs (including access roads);
- Earth works (site clearances, foundations, etc);
- Structures (cement foundations, steelworks, electric cables, substations, electrical equipment, etc);

[21] *Eskom chief engineer for transmission planning*
[22] *CSIR, 2014*

- Line material (hardware, insulators, conductors, earth wire, etc);
- Transport of material and workers;
- Purchasing of servitude area.

Major upstream categories include:

- Manufacturing of structural steel for pylons and cables;
- Manufacturing of cement.

Figure 43. During construction of new infrastructure (Gyed V-pylons)[23]

The estimated cost of the proposed Droërivier-Narina-Gourikwa 400 kV Transmission Power Line is R 1 429 743 066[24]. This project for the section between Droërivier and Narina substations, forms approximately 80% of this budget (200km of the total 260km). Some of the capital equipment including steel structures, cables, hardware, insulators, etc. and cement for the foundations will be manufactured outside the study area in places like Gauteng, Western Cape and Coega and this will support economic activity and employment in those areas. Where possible, local suppliers will be used.

It can be advised that Eskom gives preference to local procurement where possible to enhance the positive impact on the local area, although it needs to be taken into consideration that certain skill or certificate will be required in specialist areas and phases. It could also be considered to provide the necessary training in cases where applicable to share skills and experience with the local committee.

The local economy will also benefit through aspects like accommodation, retail, entertainment, etc. Money can also be injected into the pockets of the landowners by buying the servitude area for the transmission line. This will depend on which alternative transmission line option is used and on the land value per ha for the region. Table 3 shows average farm prices for a

[23] *Photo: Eskom Transmission Development Plan 2015-2024*
[24] *Eskom Transmission Development Plan 2015-2024*

selection of properties in George, Oudtshoorn/De Rust, Prince Albert, Uniondale and Beaufort West area.

Prices vary vastly depending on factors like infrastructure (including houses, wineries, guesthouses, etc), water and boreholes (and water rights), fencing, game, proximity to cities, etc. Results show on average much smaller farms for George at much higher prices per hectare. The average price per hectare for George is R287 698 compared to R2 766 for Beaufort West, R14 059 for Oudtshoorn and De Rust, R6 864 for Prince Albert, R4 429 for Uniondale and R3 355 for Willowmore.

Table 3: Average farm prices for a selection of farm properties[25]

	Average farm size, ha (> R5 million)	Average price per ha	Min price per ha	Max price per ha	Sample size
George	188	R287 689	R42 474	R857 143	16
Oudtshoorn/ De Rust	4 646	R14 059	R2 767	R26 190	11
Beaufort West	6 314	R2 766	R1 591	R3 929	10
Prince Albert	4 352	R6 864	R1 035	R21 066	11
Uniondale	4 997	R4 429	R1 899	R8 480	10
Willowmore	3 428	R3 355	NA	NA	1

Potential economic losses will be limited in the Klein and Groot Karoo sections where animals can still graze the land under the transmission lines and as such no real loss in farming activity and production is expected[26]. There are sections in the Klein Karoo in the Oudtshoorn Municipality where some economic losses could occur.

The proposed Alternative 1 crosses the Olifantsriver just south of the N12 with some prime irrigation land that may be impact on. However, the prime irrigation section is only about 2.3 km long and there is an existing transmission line. Another prime agricultural section that may be impacted is just west of the Kammanassie Dam. This is about 1.3 km wide. It is expected that most of the ostrich, small stock farming activities and cattle will be able to continue unhindered by the transmission lines.

Looking at Alternative 2, potential economic losses will be limited in the Groot Karoo sections where animals can still graze the land under the transmission lines and as such no real loss in farming activity. However, the proposed transmission line Alternative 2 crosses a section of about 65 km in the George Municipality parallel to the N9 that has mixed farming activities. Although the majority of this section includes grazing of small and large stock, dry land and irrigated fields are clearly visible. As a result the economic impact of productive agricultural land lost with Alternative 2 will be higher compared to Alternative 1.

The farms of this area are located within a sheep farming agricultural region of the Central Karoo. Cultivation is limited because of the severe climate and soil conditions, and viable agricultural land use is limited to grazing of small stock or game.

[25] *Source: Selected farms from safarmtraders.co.za (May 2015)*
[26] *This is for example in contrast to transmission lines that need to go through plantations.*

As an example, the Boeteka Karoo Padstal and Farm is located next to N12 en route to Oudsthoorn/George (Alternative 1). The Boeteka Karoo Padstal is situated next to an olive tree orchid. During the time of construction, this facility could be impacted upon by the visual disturbance, noise and dust that may result from activities related to the proposed 400kV line.

The vision and dream of expanding the Boeteka Brand has always been to provide the public with fresh homemade traditional products from Boeteka and the surrounding area of Beaufort West. This venture will include giving the wider Beaufort West community the opportunity to market and sell their own home made products in our Padstal.

We will include, other than the freshly made and products at the Boeteka Karoo Padstal, a service to pre-order meaty products such as Karoo Lamb, venison, biltong and dry wors. Pre-ordering any of our products will ensure you of availability and freshness on arrival, and will avoid the disappointment of your favourite traditional farm bread or roosterkoek to be sold out. This will be the ideal opportunity to stock up and pick up en route before your holiday.

Figure 44. Entrance of Game Farm Along the N12 (Alternative 1)

Figure 45. Dysselsdorp - Ostrich farm of Saag Jonker Group (Alternative 1)

5.11 Possible Social Impacts (see specialist study in Appendix 4.9)

The project can deliver many benefits in the long term for communities in the Western Cape and Eastern Cape. Potential negative impacts are also anticipated in the short, which can be reduced or avoided with management measures. It is anticipated that the project has the potential to realise the following positive social impacts:

- Improved quality of life, through
  - Creation of jobs ;
  - Increased procurement opportunities;
  - Increased reliability of energy services; and
  - Improved community health from the introduction and maintenance of safer sources of energy

The project can possibly also introduce negative social impacts, including:

- Loss of assets and disruption in people's lives because of physical displacement, which can arise if residences are located in the same path as the power infrastructure.
- Loss of livelihood from economic displacement, which can arise when:
  - Agricultural or other commercial activities are disrupted in the short or long term;
  - Tourist or holiday facilities become less appealing because of visual intrusion from the power infrastructure;
  - Loss of economic value of properties such as private residential estates because of visual intrusion.
- Increased community health risks from possible increased exposure to HIV/AIDS; and
- Increased community safety risks from increased direct exposure to electrical hazards, if there is tampering with power infrastructure.
- There is also a perception that the electromagnetic fields from power lines will have a negative impact on health of children. The potential of this impact will also be discussed.

5.11.1 Potential Construction Phase Impacts

The anticipated impacts associated with the construction phase of the project are of a short duration, temporary in nature, but could have long term effects on the surrounding environment. The following impacts are anticipated during the construction of the proposed transmission line:

Impact on job opportunities

Power line construction does not create large scale job opportunities. Limited opportunities for local labour are expected as the majority of the construction activities would be undertaken by specialist contractors, which are invariably from the larger population centres.. The short term benefits in this regard are thus deemed to be of a low significance.

Influx of Workers

An influx of workers from outside the study area could negatively impact on the daily living and quality of life of the property owners whose properties are affected by the transmission line alignment. This would mostly only materialise during the intermittent periods when the construction activities are taking place on those properties.

Influx of Jobseekers

An influx of jobseekers is possible, although the rural, remote and sparsely populated study area makes the gathering of large numbers of jobseekers at the construction areas unlikely.

Construction camp impacts

Projects of this nature sometimes involve the development of a construction camp(s) where the temporary construction workers are accommodated. This in itself could impact on the daily living and movement patterns of those living in close proximity to such a facility. Cumulative impacts include misbehaviour of construction workers at the construction camp and mismanagement which could result in safety and security concerns, social conflict and environmental problems. The exact location of a construction camp would determine the intensity of the impact.

Impacts on daily living and movement patterns

Construction related activities could impact on the daily living and movement patterns of the locals e.g. increased construction vehicle activity on the local roads and possible construction of new access roads. This would especially be evident in the agricultural areas where numerous gravel roads connect to tarred roads. Where construction work has to be undertaken on private properties it could also have a negative impact on those owners' daily living and movement patterns.

Impacts on daily living and movement patterns also refer to the increased noise pollution during construction activities, especially where construction would take place in close proximity to dwellings situated in low ambient noise areas (agricultural land). Right-of-way clearing and construction activities, however, will be short term. Noise will thus only be temporary generated and if construction activities adhere to all relevant legislation in this regard and limit construction activities to normal working hours, the impact is anticipated to be minimal.

Disturbance of infrastructure and services

The proposed routes intersect or are not in close proximity to existing infrastructure services such as telecommunication and railway lines. Road crossings are limited. Many rain harvesting features such as berms are evident in the area and great care should be taken to avoid placing towers or construction roads within these structures

Impact on Land use

The proposed alternatives traverse agricultural land. Commercial small stock farming is the predominant land use and it is expected that the impact will be limited and small stock farming could continue undisturbed.

Health related impacts

Health related impacts during the construction phase of the proposed project refer to the spread of sexually transmitted diseases such as HIV/AIDS between workers (usually outsiders) and the local population. The impact of HIV/AIDS on productivity in the study area is already a source of concern. Specific concerns relate to possible promiscuous activities at construction camps if these are located in close proximity to existing settlements and towns.

Safety and Security Impacts

Safety and security impacts include construction related risks and accidents, uncontrolled vehicular access, the perceived increase in crime as a result of outsiders being in the area. Whether real or perceived, these risks would need to be assessed.

Traffic Impact

During construction, the project will inevitably result in disruption of traffic on local, regional and National Roads, but to varying degrees. The severity of the impacts will depend on the order of the road (how many lanes, width, length, turns, etc), the receiving environment and vicinity of land uses and towns.

Meiringspoort is the main problem area and vehicles carrying abnormal loads should be avoided at all cost. Regular flooding during rainy seasons (winter months) will impact on any vehicles transporting material to the sites for the construction of the Alternative 1 alignment. Meiringspoort furthermore has narrow river passages with a winding road that would make it impossible for heavy vehicles to transport materials on without impacting on traffic flow. Alternative 2 would avoid this problem, but in the northern section (where it turns away from the N9 and passes WIllowmore and Rietbron) the roads are mostly farm roads and not designed for heavy vehicles.

5.11.2 Potential Operational Phase Impacts

The operational phase of power lines is a long term process. The impacts usually associated with this phase are therefore perceived by affected parties to be more severe, although not necessarily the case as transmission power lines could be referred to as a "dormant operation". Maintenance undertaken during the operational phase is however also expected to have some short-term impacts. The following impacts are anticipated to occur during the operational stages of the proposed project:

Impact on Job Opportunities

It could be expected that existing Eskom Employees will be responsible for the maintenance of the line and servitude, although some temporary maintenance work could be undertaken by locals, such as repairing damaged roads or fences. The management of the substation and wind farm would be also be managed by Eskom, potentially not resulting in additional Employment opportunities.

Impacts on daily living and movement patterns

Maintenance activities would be undertaken only when required. The impacts on the daily living and movement patterns of affected residents are thus expected to be limited.

Impact on regional and local economy

It is not anticipated that the proposed project would have a significant long term bearing on the affected Local Municipalities, the local communities and/or on the local economy. The electricity generated by the proposed wind farm will feed into the National Electricity grid, managed by Eskom Transmission. The local electricity distribution is managed by Eskom Distribution and the status quo of local electricity service delivery might not change.

Property values

Potential devaluation of properties would depend on the exact location of the line on each property, the land-use, visual impact and possible negative impact on the overall sense of place

The following specific issues were raised by the public during the participation process (also see the Issues and Response Report attached in the PPP Report):

Change in social aspect	Nature of impact
Visual	Visual changes will result in changes in the character of properties. This will have a negative economic impact. Property values and prices will drop. There will be reduced interest in tourism as the nature of the landscape will be affected from a reduction in the quality of the landscape for photography, birding and nature hikes. The planned line will also pass in front of some holiday homes, disrupting the view, and possibly leading to a reduction in property value.
Farming activities disturbed	Farming activities will be disturbed. Irrigation farmers are specifically worried about areas under centre pivot irrigation, with many channels, roads and irrigation lines that will be disrupted or cease to function.
Development Plans disturbed	Future development planning for, for example, wind and solar plants planned for the area, housing developments will have to be accommodated
No Eskom project	Social impacts if the line is not constructed
Poor project management for construction, environmental management and compensation	Employees were poorly skilled and management was poor as well. Eskom has no record of environmental management. No attempt was made to rehabilitate or reimburse owners for damage suffered. We can only hope that the project is given to a suitably qualified and competent private enterprise firm to construct
Security	Eskom does not regularly remove vegetation from its servitudes. This presents unsightly areas where illegal squatters tend to live, posing a security risk to residents.
Noise	Existing power lines are noisy
Radiation	Radiation from lines is a concern.

5.12 Possible impact on Agriculture (see Agricultural study Appendix 4.8)

The construction of a transmission line has only isolated impacts on the soil resource, due to the relatively small, separated footprints of the pylons. However, if an access road is constructed, especially in steeper areas or where erodible soils occur, the possibility of accelerated soil erosion is a reality.

Figure 46. Angora goats at a farm outside Rietbron (Alternative 2)

Specific soil conservation measures, such as contouring, culverts and diversion channels would need to be considered in susceptible areas. In addition, regular monitoring of such roads would need to be carried out. Regarding cultivation and agricultural potential, the main susceptible areas would be areas of irrigation, such as where the transmission line crosses rivers. Here, care should be taken to avoid any areas where irrigation is currently being practiced.

Figure 47. Dorper Sheep in the streets of the town of Klaarstroom[27]

During the Public Participation Process, it came to light that many farmers on the southernmost section of the line (George to Klaarstroom) are concerned about the impact of the project on their existing and planned pivot point irrigation systems. Farmers were concerned about the impact on Karoo vegetation that is used for grazing and may be damaged by vehicles during construction. Renosterveld recovers relatively quickly after disturbance but other veld types take

[27] *Photo courtesy of www.klaarstroom.co.za*

years to recover during which time stock will have to forage elsewhere. Farmers were worried that the project will “sterilise” some camps or reduce the carrying capacity.

Relevant to the study area is the Uniondale Asbos-Renosterveld where Renosterbos (*Elytropappus rhinocerotis*) is dominant on south facing slopes and Asbos (*Pteronia incana*) on north facing slopes. Succulent species (Aloe ferox, Aloe microstigma, Bulbine frutescens, Gasteria brachyphylla, Glottiphyllum depressum, etc.) were observed

It should be noted that the Aloe ferox is harvested for its medicinal and cosmetic uses and that destruction of these plants during construction of the proposed power lines could lead to a loss of income for some communities. Fortunately, the Aloe can be transplanted with ease, and it is recommended that the plants are harvested in the servitude, and replanted where they will not be damaged by construction vehicles or bush clearing.

Figure 48. Aloe Vera Harvesting

5.13 Roads and Traffic

An increase in traffic can be expected during the construction phase. The movement of machinery and vehicles will constitute an additional source of noise to the study area. However, this will be limited to the period of construction and mitigation can involve the use of equipment fitted with noise abatement technology (where possible) and the restriction of construction to certain days and times.

A number of components will have to be transported from other provinces into this region, which may temporarily add traffic (heavy vehicles) to roads in the region. Meiringspoort is subject to regular flooding during rainy seasons (winter months) which could impact on any vehicles transporting material to the sites for the construction. Meiringspoort is characterised by ravines, narrow river passages with a winding road that would make it impossible for heavy vehicles to transport materials on without impacting on traffic flow.

Figure 49. Meiringspoort landscape

6. PUBLIC PARTICIPATION

The Public Participation Process (PPP) was conducted in accordance with **Chapter 6 of the Environmental Impact Assessment Regulations, Published in Government Notice (G.N.) Number R 982 (2014)**. In addition the PPP was guided by the Integrated Environment Management Guidelines Series 7, Public Participation in the EIA process, published in Government Gazette no. 33308, 18 June 2010. See **Appendix 4.1** for Public Participation Report.

6.1 Purpose of Public Participation

The engagement of Interested and Affected Parties (I&AP's) and the Stakeholder Engagement Process is an important part of any environmental Impact assessment. The main objectives of the Stakeholder Engagement / Public Participation Process includes amongst others:

- Informing the adjacent landowners, tenants, residents' associations, ward councillors, the local municipality and other organs of state of the proposed project;
- Establishing lines of communication between the stakeholders, I&AP's and the project team;
- Providing all parties with an opportunity to exchange information and to express their views and concerns regarding the proposed project;
- Obtaining comments/input from stakeholders and I&AP's, and ensuring that all views, issues, concerns and queries raised are fully documented; and
- Identifying all the significant issues associated with the proposed project

6.2 Steps taken to notify I&AP's

See details in **Appendix 4.1** - Public Participation Report.

i) Stakeholder and land owner Identification

Stakeholder and land owner identification will provide a basic understanding of the social context in which the public participation process will be undertaken in the project. The following methods have been used for Stakeholder and land owner identification:

- Windeed searches to identify landowners;
- Consultation with Provincial, District and Local Authorities; and
- Consultation with farmers Association;

ii) Project Announcement

Project announcement, which included the placement of site notices and distribution of Background Information Documents (BID's) in Blanco and Beaufort West commenced during March and April 2015. The public participation process (PPP) part in the EIA was announced in March 2015 and was done as follows.

- Distribution of flyers

  Flyers were distributed to I&APs accompanied by a Background Information document (BID). A registration form with map was distributed. (Knock and drop) from March 2015 to end May 2015.

- Newspaper advertisement

Newspaper advertisement was placed in The Herald (Eastern Cape) on 8 April 2015, Die Courier (Western Cape) on 2 April 2015 & Sunday Times (National) on 29 March 2015 requesting Interested and Affected Parties (I&APs) to register, and submit their comments.

- Newspaper articles
  Newspaper articles were encouraged and numerous reporters were approached and supplied with information on the project. This resulted in the publication of numerous news articles published, broadening the reach of the public notification process.

- Site Notices and Flyers
  Site notices were displayed within the boundaries of the study area from 5 March 2015.

- Background Information Documents
  A Background Information Document was produced and distributed during Scoping phase, which included:
  - A "knock and drop" exercise in Beaufort West and Blanco;
  - Open Day meetings;
  - Information Sharing Sessions with Councillors and officials; and
  - Requests due to advertisements placed.

- Open Days/Focus Group meetings

  Open Days which serve as information sessions to introduce the proposed project to the public and to discuss the project aim were held in August 2015 and details are included in this Scoping Report. Dates of meetings and open days are shown below:

Date	Time	Location
3 August	9H00 to 12H00	Monte-Christo eco estate / Klein Brak
	19H00 to 21h00	George municipal hall
4 August	9H00 to 12H00	Uniondale: Crackling Rosy Restaurant
	19H00 to 21h00	Wilowmore Farmers Union Hall
5 August	9H00 to 12H00	Rietbron library
	19H00 to 21h00	Beaufort West Bowling Club
6 August	9H00 to 12H00	Klaarstroom NG Kerk Saal

At the end of the announcement phase, all comments/input from stakeholders and I&AP's, were captured in the Issues and Response Report (IRR) which forms part of the Final Scoping Report, and issues raised in the EIA meetings transferred into this EIA Report.

NB: During the EIA Phase, further focus group meetings were undertaken in the week of the 19-22 September 2016 to discuss progress on the project. However the minutes of the EIA meeting will only be include in the EIA report and not in this scoping report.

6.3 I&AP Register

An I&AP's register was opened and maintained in terms of Regulation 55 and contains the names, contact details and addresses of:

- All persons who, as a consequence of the public participation process have submitted written comments or attended meetings with the applicant or EAP; and
- All organs of state which have jurisdiction in respect of the activity to which the application relates.

6.4 Public Participation Report

A specialist report is attached to document the Public Participation Process (PPP) that the project consultants have performed during the Scoping Phase of the project. See **Appendix 4.1** for Public Participation Report)

6.5 Review of the Draft Scoping Report

The EIA process for the proposed construction of the Blanco to Droërivier 400kV Power line and Substation commenced in early 2015 with the reference number: 14/12/16/3/3/2/922. This application has however lapsed in accordance with Regulation 23 (1) of the EIA Regulations, 2014 and a new EIA process is currently being initiated. This new process entails (1) the resubmission of a new application to DEA and the project will be assigned a new reference number, (2) the release of a Draft Scoping Report (DSR) to be followed by a Draft Environmental Impact Assessment (DEIA) Report for public review and thereafter (3) submission the final reports to DEA for decision-making.

It must be noted that the contents of both the Draft Scoping and the Draft EIA report will not change as the scope of the project and the environment still remains the same. Please advise if your comments have remained the same or if you have additional or new comments.

The Draft Scoping Report will be made available to all registered I&AP's and Organs of State for review, for a period of 30 days at the following public locations:

* The Envirolution website at www.envirolution.co.za
* Dropbox link sent to registered I&APs
* George Public Library and Beaufort West Public Library

After the commenting period of 30 days for I&AP's, Envirolution (Pty) Ltd will consider the comments received, and complete the final SR. In terms of regulation 43 and 44 I&AP are entitled to comment on reports and plans and the comments must be recorded in the report. NB: As the new process for the project progresses the PPP report will be updated accordingly and Envirolution will submit the final SR together with any previous comments received in the initial scoping process to the Department of Environmental Affairs.

6.6 Authority Review of SR

Hard copies and CDs of the Draft Scoping report will be sent to:

- Department of Environmental Affairs
- Western Cape Department of Environmental Affairs and Development Planning, George;
- Eastern Cape Department of Economic Development and Environmental Affairs (DEDEA),
- District and Local Municipalities
- Department of Water and Sanitation (DWS)

The Draft Scoping Report will also be made available to other Stakeholders, Municipalities and Organs of State on the Envirolution website at www.envirolution.co.za and/or Dropbox.

6.7 Summary of Issues Raised by I&AP's

Issues and concerns raised by I&AP's to date have been integrated into the Issues and Responses Report of this Final Scoping Report. The issues and concerns were raised by means of:

- issues raised during open day meeting and focus group meetings;
- written submissions in response to advertisements
- Telephonic communications with I&AP's;
- Issues raised through written correspondence received from I&AP's (fax, email and mail).

The issues raised during the initial Scoping Phase of the project are presented in the PPP report. The list below provides a summary of the main issues that were raised thus far.

1. **Risk of fires** from the Eskom lines and impact on farms
2. Concerned about the line going past **irrigation** dams and over fences
3. There are currently two power lines along the N12, one of them a 400 KVA line and another, much older line. We have a number of fences crossing this area so would be very much affected by the proposed project. So little has been publicized about this project. Two lines are traversing the property already – we want no more lines
4. There are sights of significant **cultural** value on the farms. Some of the buildings date from the 1800's some bushmen paintings exist on the farms
5. Concerned about the **arable land covered by the servitude**. Pylons will hamper future expansion of pivot point irrigation plans
6. **Wind farm** of Mainstream RP (30km from Scheurfontein) The line will traverse through a planned wind farm. With existing alignment the project will be badly affected.
7. Concerned about the close proximity of the line to the existing house this will be exacerbated with an extra line. There is **no space to place another** line. The existing lines are hampering cutting and cultivation of existing fields. Additional pylons will make mechanization of activities virtually impossible. Suggests that the line be built to the south of the existing line away from cultivated fields.
8. The line will go over **established dams and apple orchards**. Existing orchard support wires close to the existing ESKOM lines build up static electricity with "possible electrocution" . Lines will have to be earthed at extra cost. With the construction of the previous line, construction teams destroyed the road and despite numerous requests from the farm management the damage were not repaired. The farmer had to repair the road at own expense after a year of correspondence and no rectification.
9. The new line and the existing lines are crossing the **catchment dam**. Some of the existing lines have no flight path aversion markers on it causing bird fatalities. In 2015 eagles have collided with the line. Blue Cranes are at risk.
10. The limited **compensation** that is normally paid does not compensate the farmer enough for the "loss" he incurs both financially and loss of aesthetics of his land.
11. There is 'ethical problem" with the line **destroying the natural beauty** of an unspoilt area in south Africa.
12. **Low density of vegetation** (shrubs) in the Karoo is already a problem and further disruption and destruction of the veld would reduce grazing capacity and income. Depending on the rainfall, it could take up to 3years for the veld to return to original state and will be available for grazing. Will farmers be compensated for the time that areas of servitudes that are under rehabilitation cannot be used?

13. **Vehicles for maintenance** will drive for 10Km or more in areas where these plants will be destroyed, leaving ground open for erosion. Angora goats prefer new soft vegetation under the lines and eat the plants rather than graze in the rest of the farm, thus the area will be cleared further and more erosion follow.
14. Disturbed areas should be **fenced** off (at Eskom cost - It would cost R25000 per km to fence both sides of the servitude).However, the area between the road and the line turns into a barren strip without water, so the strip cannot be used as a separate camp for stock. Water systems need to be provided for blocks of veld between fences and servitude.
15. In the Eastern Cape, unpaved roads are not maintained and heavy vehicles will destroy the surface and worsen the situation.
16. *Suurpootjie* **tortoises** found in the Karoo
17. Sections of **stock camps will be sterilised** for a period during and after construction. Rehabilitation takes time and Eskom not always replanting.
18. For **dust** suppression water trucks will be required. Where will water be obtained? From private farms? This is not acceptable.
19. **Electro-magnetic fields** may impact on animal and human health.
20. The line over Uniondale will impact on farm lands where other lines already exist. **Visual** impact to be investigated. Existing and planned Pivot points to be taken into consideration.
21. Concerns about the close proximity of the line to the existing house. The existing lines are hampering cutting and cultivation of **existing fields**. Additional pylons will make mechanisation of activities virtually imposable.
22. A property is 3km long, but only 750 metres wide, with a nature based lodge specialising in the natural beauty and the views. A powerline anywhere along the length of our property with the combined ground clearing would render us **unable to trade** and force closure.
23. Why Eskom wants to run a line over our land when the **existing high voltage lin**e is situated less than 1km to the east of some properties.
24. **Koi San** graves to be investigated
25. Clearing of the servitude in the **Ranteveld** must be approached in an ecologically sensitive manner
26. Farmers already have to pay **levies** for Eskom regarding the network, the environment and services. Can Eskom not cut down (exempt farmers) from levies? In the past lines were built by private sector and later Eskom bought it back.
27. **Cumulative** impact studies must be done on all existing power lines and the other impacts associated with all the numerous mining and renewable energy applications in the area.
28. There will be substantial negative impact of the existing line on priority bird species
29. Maintenance issues – “Eskom sometimes flattens fence lines and leave gates open (break locks) etc”.
30. Could the line not be moved to the area along the slopes of the mountain where the existing 132kv is located? Propose this as another alternative.
31. Can the exiting line not be optimised to carry the extra load?
32. **Cumulative** Avifaunal impact studies must be done
33. **How practical** is the Alternative 2? (Cape Nature comment)

The 2016 draft document was made available to I&APs as part of a new application) to allow further comments. New main issues were not raised, but more details of land use developments and farming activities on individual properties were submitted. Please see the PPP report for correspondence and detailed issues.

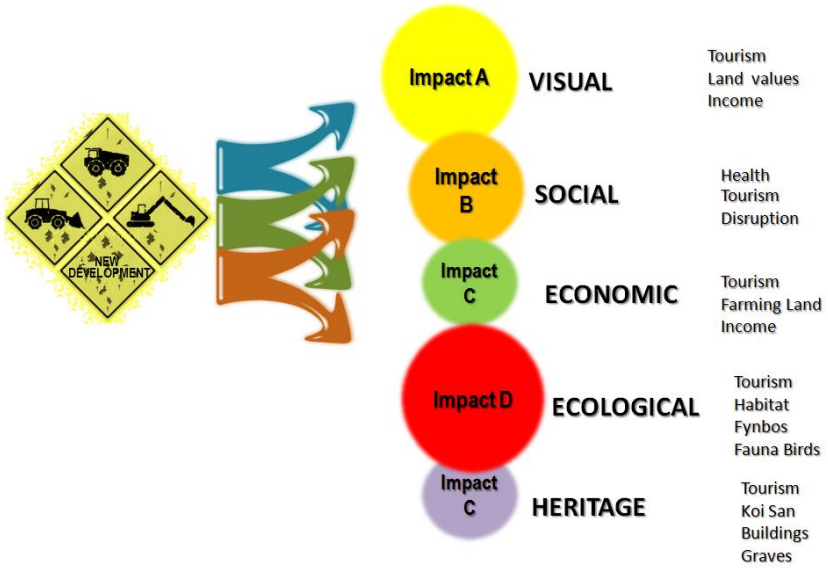
Addition Issues and comments raised during the public review period of this Draft Scoping Report (together with previous comments for the Scoping) will be submitted to DEA and carried over to the EIA Phase for further consideration where applicable.

The most important issues below can be categorised into the following:

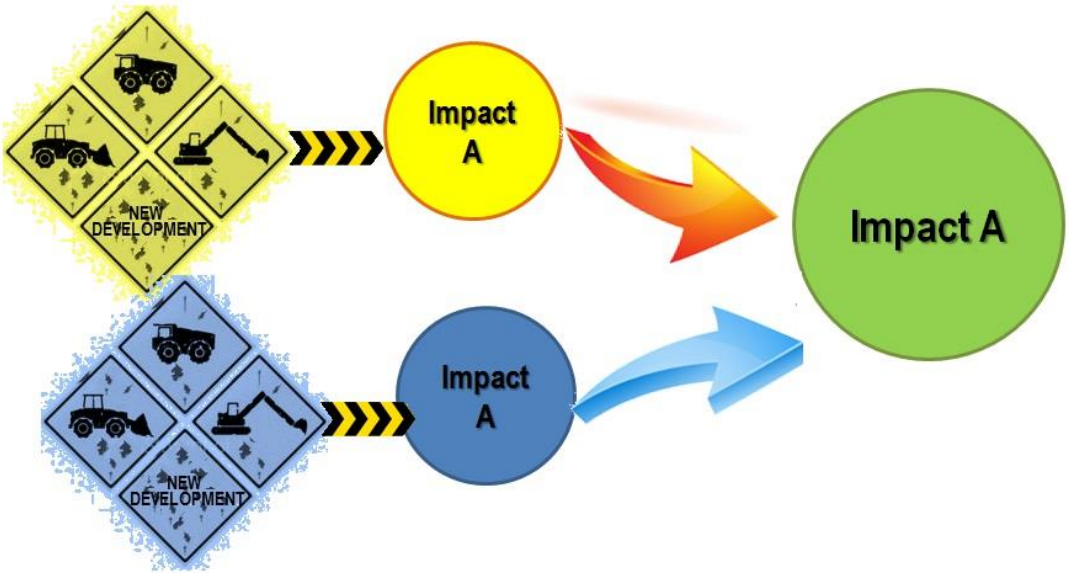
Visual impact (servitude widths, B&Bs, natural areas)
Health issues (electro-magnetic fields)
Maintenance and rehabilitation
Ecology: Disturbance of natural areas & Impact on birds in particular
Economic issues - loss of **farming** infrastructure and land, loss of **tourism** and income, physical (practical) impact on lucern and other crops
Social Issues – impact on tourism (B&B facilities) and farming activites/way of life
Heritage artefacts (Khoi San paintings, graves, old buildings)

These particular issues will be investigated in more detail during the EIA Phase, focussing on the recommended/preferred line alternative. Specialist studies will include reference to the issues that have been raised by the public and stakeholders during the Scoping Phase.

The diagram below shows the schematic representation of the major impacts that were identified.



The project has a combined effect when assessed in conjunction with other activities. The individual insignificant impacts of several developments might have a significant **cumulative** adverse impact on the environment when viewed together, as illustrated in the graph below



The following **cumulative** impacts have been identified in terms of the proposed development and warrant further investigation during the assessment phase:

- Impact on Tourism
- Potential loss of scarce fauna and flora due to developments in the area
- a potential loss of viable and high potential agricultural/ grazing land
- potential increase in visual impacts associated with additional power lines in the area.
- the demand for additional electrical infrastructure to serve the area

7. ASSESSMENT

7.1 Description of the Need and Desirability

The Guideline On Need And Desirability published by the Western Cape Department of Environmental Affairs & Development Planning[28] (DEA&DP), lists 14 questions to determine the need and desirability. Table 4 (below) includes answers relevant to the proposed project.

Table 4. Need and Desirability

NEED ('Timing'):
Question 1: Is the land use (associated with the activity being applied for) considered within the timeframe intended by the existing approved Spatial Development Framework (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). **Answer: Yes** The IDP[29] document for Beaufort West makes mention of further job creation (Local Economic Development) in the region. The project will provide jobs to local communities.
Question 2: Should development, or if applicable, expansion of the town/area concerned in terms of this land use (associated with the activity being applied for) occur here at this point in time? Answer: **No**, the infrastructure is mostly located outside of the town areas.
Question 3: 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) **Answer: Yes** On local level, the project has potential socio-economic benefits, such as jobs. On a national level the project will contribute to strengthen the transmission network of the Western and a Southern Cape areas.
Question 4: 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? **Answer: Yes** The existing infrastructure will be used by the proponent for the proposed project. This Scoping & EIR will determine if additional infrastructure such as roads will be require for the development.
Question 5: 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)? **Answer: No** No negative impact is anticipated on municipal infrastructure planning. The infrastructure of the proposed activity would be provided and maintained by the proponent of the project (Eskom).
Question 6: Is this project part of a national programme to address an issue of national concern or importance?

[28] *DEA&DP (2010) Guideline on Need and Desirability, EIA Guideline and Information Document Series. Western Cape Department of Environmental Affairs & Development Planning (DEA&DP).*

[29] *Beaufort West Municipality DRAFT IDP 2012-2017*

Answer: Yes
The Blanco – Droërivier project will enable the transmission of generated electricity to the national grid.

DESIRABILITY ('placing'):

Question 7: Is the development the best practicable environmental option for this land/site?
Answer: To be determined by EIR
The specialist studies to be conducted during the EIR phase of the project will give a clear indication of environmental options.

Question 8: Would the approval of this application compromise the integrity of the existing approved and credible municipal IDP and SDF as agreed to by the relevant authorities.
Answer: No
The Blanco – Droërivier project will enable the transmission of generated electricity to the national grid, which will support the IDPs and SDFs in terms of surety (reliability) of supply.

Question 9: Would the approval of this application compromise the integrity of the existing environmental management priorities for the area (e.g. as defined in EMFs), and if so, can it be justified in terms of sustainability considerations?
Answer: No
The proposed project will require mitigation of potential negative environmental impacts during the construction phase of the project. During the operational phase of the project, livestock and game grazing and wild animals will continue in the power line servitude.

Question 10: 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 the footprint area within its broader context).
Answer: Yes
The objective of this project is to connect the proposed Blanco (Narina) Transmission Substation to the Droërivier Transmission Substation and the National electricity grid. Specialist studies, such as a Visual Impact Assessment to be conducted during the EIR phase, will determine the most practical and environmentally preferable placement of the lines.

Question 11: How will the activities or the land use associated with the activity applied for, impact on sensitive natural and cultural areas (built and rural/natural environment)?
Answer:
This EIR process will determine the potential impact on the environment and if negative impacts are identified, mitigation measures will be proposed.

Question 12: How will the development impact on people's health and wellbeing (e.g. in terms of noise, odours, visual character and sense of place, etc)?
Answer:
No negative impacts are anticipated regarding noise or odours during the operational phase of the project. Visual character and sense of place impacts are anticipated and the EIAR will determine the extent of impacts and propose mitigation measures if required.
Socio-economic benefits are likely to result from the proposed project and might include job creation. Impact on tourism facilities is an issue that has been raised during the PP process and will be investigated during the EIA phase of the project.

Question 13: Will the proposed activity or the land use associated with the activity applied for, result in unacceptable opportunity costs?
Answer: No
The project area is of linear nature and the primary land use will continue as is.

Question 14: Will the proposed land use result in unacceptable cumulative impacts?
Answer:

The EIAR will determine the full extent of impacts and propose mitigation measures if required.

At the end of the review periods of the Draft Scoping Report, all comments/input from stakeholders and I&AP's were captured in the Issues and Response Report (IRR) which forms part of this Final Scoping Report.

7.2 Route Alternative Evaluation

Both the Preferred Alternative 1 as well as Alternative 2 will create impacts. The magnitude of the impacts and the type of environment that will be influenced must be comparatively evaluated in order to recommend an option and focus the specialist studies. The specialist studies focus must be to fully understand the nature of the impacts and develop mitigation options for the recommended route.

A comparative table has been drawn up where the various environments as well as the impact of the activity on those environments where classified in a simplistic way in order to establish an option with

a) the least possible impacts
b) avoidance of impacts
c) manageable impacts
d) mitigation possibility

The Public Participation has indicated that both routes present aesthetic and practical impacts that are unacceptable to land owners and inhabitants of various properties.

However, as impacts are unavoidable with both alternatives, unpopular choices need to be established in order for the national energy supply grid to function in a developmental society. These choices need to be influenced by empirical evaluation and not emotional or singular individual objections. The choices need also be influenced by the mitigation hierarchy that applies to environmental impact assessments methodology. The rationale behind the scoring method for the Table is that avoidance takes precedent followed by minimisation, management and mitigation.

A further empirical evaluation must be influenced by the type of environment that is being impacted upon e.g. wetlands are heavier weighted environments with more sensitive elements than a broad expanse of Karroo Vegetation. However if avoidance can be implemented in a wetland then the impact value is zero. Similarly avoidance of heritage and Unesco sites (e.g. Swartberg Nature Reserve) are weighted as zero but crossing of the sites has an international impact which is also heavier weighted apart from the impacts that will occur on the bio-physical environment. Visual impacts in a touristic area will also have heavier consideration so the option should fall on the route less travelled.

These issues will be investigated in more detail once an Alternative has been isolated and recommended in the EIA phase to follow.

7.3 Impact Evaluation methodology

Direct, indirect and cumulative impacts of the issues identified through the scoping study, as well as all other issues identified in the EIA phase must be assessed in terms of the following criteria:

- The **nature**, which shall include a description of what causes the effect, what will be affected and how it will be affected.
- The **extent**, wherein it will be indicated whether the impact will be local (limited to the immediate area or site of development) or regional, and a value between 1 and 5 will be assigned as appropriate (with 1 being low and 5 being high):
- The **duration**, wherein it will be indicated whether:
  - very short duration (0–1 years) – assigned a score of 1;
  - short duration (2-5 years) - assigned a score of 2;
  - medium-term (5–15 years) – assigned a score of 3;
  - long term (> 15 years) - assigned a score of 4; or
  - permanent - assigned a score of 5

- The **consequences (magnitude)**, quantified on a scale from 0-10, where 0 is small and will have no effect on the environment, 2 is minor and will not result in an impact on processes, 4 is low and will cause a slight impact on processes, 6 is moderate and will result in processes continuing but in a modified way, 8 is high (processes are altered to the extent that they temporarily cease), and 10 is very high and results in complete destruction of patterns and permanent cessation of processes.

- The **probability** *of occurrence*, which shall describe the likelihood of the impact actually occurring. Probability will be estimated on a scale of 1–5, where:

1 is very improbable (probably will not happen),
2 is improbable (some possibility, but low likelihood),
3 is probable (distinct possibility),
4 is highly probable (most likely) and
5 is definite (impact will occur regardless of any prevention measures).

The potential impacts have been assessed in terms of the following factors:

Probability	Duration
1. Very improbable 2. Improbable (low likelihood) 3. Probable (distinct possibility) 4. Highly probable (most likely 5. Definite (regardless of measures to prevent)	1. A of very short duration (0-1 year) 2. Short duration (2-5 years) 3. Medium term (5-15 years) 4. Long term (>15 years) 5. Permanent(or ongoing during lifetime)

Extent	Magnitude
1. Limited to the site 2. Limited to the local area 3. Limited to the region 4. National 5. International	0. Small or no effect 2. Minor or no impact on processes 4. Low, with slight impact on processes 6. Moderate (processes continue but modified) 8- high (processes altered and stop temporarily) 10. Very high and destructive of patterns with processes permanently stopping

Magnitude + Duration + Extent x Probability = Significance Score

- the **significance**, which shall be determined through a synthesis of the characteristics described above and can be assessed as low, medium or high; and
- the **status**, which will be described as either positive, negative or neutral.
- the degree to which the impact can be **reversed** (low, moderate, high).
- Whether the impact may cause ***irreplaceable*** **loss of resources** (Yes/No).
- Whether the impact can be ***mitigated.***

The **significance** is calculated by combining the criteria in the following formula:

S=(E+D+M)P
S = Significance weighting
E = Extent
D = Duration
M = Magnitude
P = Probability

The **significance weightings** for each potential impact are as follows:

2 < 30 points: Low (i.e. where this impact would not have a direct influence on the decision to develop in the area),

3 30-60 points: Medium (i.e. where the impact could influence the decision to develop in the area unless it is effectively mitigated),

4 > 60 points: High (i.e. where the impact must have an influence on the decision process to develop in the area).

Assessment of impacts will be summarised in the following table format. The rating values as per the above criteria are included In some instances the impact will be similar for all alternatives, but a distinction will be made between impacts that are pertinent for a particular Alternative. The No Go Option will be included in the assessment.

7.4 Assessment Tables

The most important issues that were raised during the Scoping Phase and are included in the tables below are:

Visual impact (servitude widths, B&Bs, natural areas)
Health issues (electro-magnetic fields)
Maintenance and rehabilitation
Ecology: Disturbance of natural areas & Impact on birds
Economic issues - loss of **farming** infrastructure and land
Social Issues – impact on tourism (B&B facilities) and way of life
Heritage artefacts (Khoi San paintings, graves, old buildings)

These particular issues will be investigated in more detail during the EIA Phase. Specialist studies will include reference to the issues that have been raised by the public and stakeholders during this Scoping Phase.

Ecological Impact Assessment:

Loss & disturbance of indigenous vegetation due to clearing of the footprint area		
Nature: The area for the proposed substation and power line will be cleared of vegetation. This will result in the loss of indigenous species, disturbance of species of conservation concern and the fragmentation of vegetation communities. The removal of vegetation will also expose soil increasing the risk of erosion. Both alternatives 1 & 2 intersect vegetation types that are regarded as threatened vegetation types on a national level. Note that all the vegetation types intersected by Alternative 2 within the Eastern Cape section of the route (Uniondale Shale Renosterveld, Steytlerville Karoo, Gamka Karoo, Southern Karoo Riviere & Groot Thicket) are not threatened vegetation types. Alternative 2 may have a higher negative impact on critically endangered vegetation types than Alternative 1, but this depends on the current ecological condition of the intersected areas. (Botanical Specialist Report, Jan Vlok, 2015) Both the alternative routes intersect several known populations of threatened plant species. Of particular concern here is that Alternative 1 intersects populations of threatened plant species within the specially protected and sensitive Swartberg Nature Reserve area. The existing power line already had a negative impact on the local fynbos communities and a parallel 400kV power line will certainly exacerbate the impact, probably with cumulative impacts within this very sensitive environment (Botanical Specialist Report, Jan Vlok, 2015).		
CONSTRUCTION PHASE		
Rating of Impacts	**Without mitigation**	**With mitigation**
Probability	Definite (5)	Definite (5)
Duration	Medium-term (3)	Short Duration (2)
Extent	Limited to Site (1)	Limited to Site (1)
Magnitude	Moderate (6)	Low (4)
Significance	**50 (moderate)**	**35 (moderate)**
Status (positive or negative)	Negative	Negative
OPERATIONAL PHASE		
Probability	Definite (5)	Highly probable (4)
Duration	Medium-term (3)	Short Duration (2)
Extent	Limited to Site (1)	Limited to Site (1)
Magnitude	Moderate (6)	Low (4)
Significance	**50 (moderate)**	**28 (low)**
Status (positive or negative)	Negative	Negative
Reversibility	Low	High
Irreplaceable loss of resources?	Moderate	Low
Can impacts be mitigated?	Yes	
NO GO Option	A No Go Option will not lead to a loss or in disturbance of indigenous vegetation due to clearing of the footprint area.	

Mitigation:

- The Swartberg Nature Reserve should be approached as a very sensitive area and all species of conservation concern to be identified, and trans-located prior to construction.
- The clearing of vegetation must be kept to a minimum and within the power line servitude.
- Once pegged, the site must be inspected during the summer season by a botanist to identify all species of conservation concern along the power line route. These species must be trans-located prior to any construction activities;
- Disturbed areas must be rehabilitated immediately after construction has been completed in that area by planting appropriate indigenous plant species;
- ;During the construction phase workers must be limited to areas under construction and access to the undeveloped areas must be strictly controlled;
- Rehabilitated areas must be monitored to ensure the establishment of re-vegetated areas.

Cumulative impacts: Expected to be minimal. The vegetation on the site is disturbed as a result of human activities and no highly sensitive habitat was identified.

Residual Risks: None anticipated provided that the mitigation measures are implemented correctly and rehabilitation of the site is undertaken.

Proliferation of Alien plant species		
Nature: Alien invasive species will quickly encroach into disturbed areas, particularly adjacent to drainage areas. Both alternatives 1 & 2 intersect will have the potential to disturb areas and result in the spread of alien invasive species.		
CONSTRUCTION PHASE		
Rating of Impacts	**Without mitigation**	**With mitigation**
Probability	Definite (5)	Highly probable (4)
Duration	Medium-term (3)	Medium-term (3)
Extent	Limited to Local Area (2)	Limited to Local Area (2)
Magnitude	High (8)	Moderate (6)
Significance	**65 (high)**	**44 (moderate)**
Status (positive or negative)	Negative	Negative
OPERATIONAL PHASE		
Probability	Highly probable (4)	Probable (3)
Duration	Permanent (5)	Permanent (5)
Extent	Limited to Local Area (2)	Limited to Site (1)
Magnitude	High (8)	Low (4)
Significance	**60 (high)**	**30 (moderate)**
Status (positive or negative)	Negative	Negative
Reversibility	Low	Moderate
Irreplaceable loss of resources?	Moderate	Low
Can impacts be mitigated?	Yes	
NO GO Option	A No Go Option will not lead to the accelerated encroachment of alien invasive species since no additional areas wil be disturbed for the project.	

Mitigation:

- An alien invasive management programme must be incorporated into the Environmental Management Programme;
- Ongoing alien plant control must be undertaken along the power line servitude route;
- Areas which have been disturbed will be quickly colonised by invasive alien species. An ongoing management plan **must** be implemented for the clearing/eradication of alien species.
- Monitor all sites disturbed by construction activities for colonisation by exotics or invasive plants and control these as they emerge.

Cumulative impacts: Expected to be moderate, should mitigation measure not be implemented. Alien invader plant species pose an ecological threat as they alter habitat structure, lower biodiversity (both number and "quality" of species), change nutrient cycling and productivity, and modify food webs.

Residual Risks: None anticipated provided that the mitigation measures are implemented correctly and rehabilitation of the site is undertaken.

Loss of faunal habitat and ecological structure

Nature: The construction phase and operational phase of the power line development will result in the loss of faunal habitats within the area. This impact relates to the complete removal or partial destruction/disturbance of existing vegetation by machinery and workers, impacting directly on the ecological condition of natural vegetation and habitat availability. These activities will have an impact on foraging and breeding ecology of faunal species. Loss of vegetation generally affects nutrient cycles, removes the organic litter layer and results in habitat fragmentation and destruction of wildlife corridors. Both alternatives 1 & 2 intersect vegetation types that are regarded as sensitive, or that influence the breeding and feeding of fauna. The impact is similar for both alternative, but due to the additional length of Alternative 2, the impact may be more than for Alternative 1.

CONSTRUCTION PHASE		
Rating of Impacts	**Without mitigation**	**With mitigation**
Probability	Definite (5)	Definite (5)
Duration	Short Duration (2)	Short Duration (2)
Extent	Limited to Local Area (2)	Limited to Local Area (2)
Magnitude	High (8)	Moderate (6)
Significance	**60 (high)**	**50 (moderate)**
Status (positive or negative)	Negative	Negative
OPERATIONAL PHASE		
Probability	Probable (3)	Improbable (2)
Duration	Permanent (5)	Permanent (5)
Extent	Limited to Site (1)	Limited to Site (1)
Magnitude	Moderate (6)	Low (4)
Significance	**36 (moderate)**	**20 (low)**
Status (positive or negative)	Negative	Negative
Reversibility	Moderate	High
Irreplaceable loss of resources?	Low	Low
Can impacts be mitigated?	Yes	
NO GO Option	A No Go Option will not result in the loss of faunal habitats or ecology in the area.	

Mitigation:

- All construction and maintenance activities must be carried out according to the generally accepted environmental best practice and the temporal and spatial footprint of the development must be kept to a minimum.
- The boundaries of the development footprint areas are to be clearly demarcated and it must be ensured that all activities remain within the demarcated footprint area.
- Edge effects of all construction and operational activities, such as erosion and alien plant species proliferation, which will affect faunal habitats adjacent to the development area, need to be strictly managed.
- Any natural areas beyond the development footprint, which have been affected by the construction activities, must be rehabilitated using indigenous plant species.
- Education and awareness campaigns on faunal species and their habitat are recommended to help increase awareness, respect and responsibility towards the environment for all staff and contractors.

Cumulative impacts: Expected to be minimal. The habitat is however already largely transformed and fragmented due to the adjacent activities and the site is not a unique habitat within the landscape. It is not envisaged that any Red Data species will be displaced by the habitat transformation that will take place as a result of the construction and operation of the proposed development. The impact on smaller, non-Red Data species that are potentially breeding in the area will be local in extent, in that it will not have a significant effect on regional or national populations.

Residual Risks: None anticipated provided that the mitigation measures are implemented correctly and rehabilitation of the site is undertaken.

Direct impact on faunal communities

Nature: Activities involving the clearing/harvesting of natural vegetation will result in the loss of faunal species.

Faunal diversity within the study area has been negatively impacted as a result of historic and on-going disturbances associated with agriculture and housing developments. **. Based on the available spatial planning tools and species distribution data, it is recommended that the B-D alternative 1 is the preferred route option for the Blanco to Droerivier section of the proposed power line.** However, this recommendation is subject to establishing the known distribution range of the subpopulation of Riverine Rabbit in the northern section. It is also suggested that the route be re-aligned to avoid the SKEP reptile priority area north of the Swartberg Mountains. If chosen, on ground surveying of 'sensitive' areas should take place along the route to accommodate adjustments to the alignment (e.g. avoiding rocky outcrops and habitats suitable for SCC).

CONSTRUCTION PHASE		
Rating of Impacts	**Without mitigation**	**With mitigation**
Probability	Definite (5)	Definite (5)
Duration	Short Duration (2)	Short Duration (2)
Extent	Limited to the Local Area (2)	Limited to the Local Area (2)
Magnitude	High (8)	Moderate (6)
Significance	**60 (high)**	**50 (moderate)**
Status (positive or negative)	Negative	Negative
OPERATIONAL PHASE		
Probability	Highly Probable (4)	Probable (3)
Duration	Permanent (5)	Permanent (5)
Extent	Limited to the Local Area (2)	Limited to Site (1)
Magnitude	Moderate (6)	Low (4)
Significance	**52 (moderate)**	**30 (moderate)**
Status (positive or negative)	Negative	Negative
Reversibility	Low	Moderate

Irreplaceable loss of resources?	Moderate	Low
Can impacts be mitigated?	Yes	
NO GO Option	A No Go Option will not change the status quo of faunal communities within the area.	

Mitigation:

- It is recommended that a speed limit of 30km/h is implemented on all roads running through the study area during all phases in order to minimise risk to fauna from vehicles.
- No trapping or hunting of fauna is to take place. Access control must be implemented to ensure that no illegal trapping or poaching takes place.
- Should any Red Data faunal species be noted within the development footprint areas, these species must be relocated to similar habitat within the vacant land to the west of the development area with the assistance of a suitably qualified ecologist.
- Any fauna directly threatened by the construction activities must be removed to a safe location by the ECO or qualified Ecologist.
- All staff and contractors must undergo an environmental induction course held by the ECO as well as faunal education and awareness programmes.

Cumulative impacts: Expected to be moderate to minimal, should the recommended mitigation measures not be adequately implemented. During the operational phase, a further loss of faunal diversity and ecological integrity will occur due to the increase in human activity and potential poaching.

Residual Risks: None anticipated provided that the mitigation measures are implemented correctly and rehabilitation of the site is undertaken.

Impact of disturbance and noise pollution on fauna

Nature: Disturbance created by noise-pollution associated with workers and construction activities can affect local wildlife utilising adjacent habitats, particularly mammalian species. This is likely to be short-lived during the construction phase but will continue to have an impact during the operational life span of the development. The disturbance and noise impact is similar for both alternatives, but due to the additional length of Alternative 2, the impact may be more than for Alternative 1.

CONSTRUCTION PHASE		
Rating of Impacts	**Without mitigation**	**With mitigation**
Probability	Definite (5)	Highly Probable (4)
Duration	Permanent (5)	Permanent 5)
Extent	Limited to Site (1)	Limited to Site (1)
Magnitude	Moderate (6)	Low (4)
Significance	**60 (high)**	**40 (moderate)**
Status (positive or negative)	Negative	Negative
OPERATIONAL PHASE		
Probability	Probable (3)	Improbable (2)
Duration	Permanent (5)	Permanent (5)
Extent	Limited to Site (1)	Limited to Site (1)
Magnitude	Moderate (6)	Low (4)
Significance	**36 (moderate)**	**20 (low)**
Status (positive or negative)	Negative	Negative
Reversibility	Low	Moderate
Irreplaceable loss of resources?	Moderate	Low
Can impacts be mitigated?	Yes	
NO GO Option	A No Go Option will not result in additional noise and disturbance in the area.	

Mitigation:

- Strict control must be maintained over all activities during construction, in line with an approved Construction EMPr.
- Any Red Data species identified in this report observed to be roosting and/or breeding in the vicinity, the ECO must be notified.

Cumulative impacts: ***S***pecies at Nature Reserves and mountainous areas along the power line development route may experience high levels of disturbance. Species are particularly sensitive to disturbance during the breeding season and this must be borne in mind during both the construction and operational phases.

Residual Risks: None anticipated provided that the mitigation measures are implemented correctly and rehabilitation of the site is undertaken.

Avifaunal Impact Assessment: Habitat Destruction

Nature: During the construction phase and maintenance of substations and power lines, some habitat destruction and alteration will occur due to the clearing of servitudes and vegetation at the substation site. Servitudes have to be cleared of excess vegetation at regular intervals in order to allow access to the line for maintenance, to prevent vegetation intrusion and to minimise the risk of fire under the lines. These activities have an impact on foraging, breeding and roosting ecology of avian species within the area through modification of habitat.

Avian species that are most consistently affected by over head transmission lines are water birds that congregate at wetlands and commute between them in flocks, examples being large and / or fast flying species examples such as ducks, geese, flamingos, storks, herons and waders, that have a high collision rate. Game birds and rails have less exposure but are still highly susceptible. Canes, storks, bustards which are large heavy bodied, flocking and low flying are also highly susceptible to collisions with over head transmission power lines.

From an avian point of view Alternative 2 would not be recommended due to the fact that it is the longest of the two options and could cause a greater impact to the avian population, taking in to account the increase of breeding predatory birds such as the Martial Eagle and Eagle Owls. (Avifauna Report, Rodney Chrisford, 2015)

CONSTRUCTION PHASE		
Rating of Impacts	**Without mitigation**	**With mitigation**
Probability	Definite (5)	Highly Probable (4)
Duration	Permanent (5)	Permanent (5)
Extent	Limited to Site (1)	Limited to Site (1)
Magnitude	Moderate (6)	Low (4)
Significance	**60 (high)**	**40 (moderate)**
Status (positive or negative)	Negative	Negative
OPERATIONAL PHASE		
Probability	Probable (3)	Improbable (2)
Duration	Permanent (5)	Permanent (5)
Extent	Limited to Site (1)	Limited to Site (1)
Magnitude	Moderate (6)	Low (4)
Significance	**36 (moderate)**	**20 (low)**
Status (positive or negative)	Negative	Negative
Reversibility	Moderate	High
Irreplaceable loss of resources?	Low	Low
Can impacts be mitigated?	Yes	
NO GO Option	A No Go Option will not result in destruction of any habitats within the study area.	

Mitigation:

- Owners of Game Reserves to be consulted to estimate if and where there is a need for bird flight diverters being attached to the transmission power lines that cross their properties (Avifauna Report, Rodney Chrisford, 2015).
- All construction and maintenance activities must be carried out according to the generally accepted environmental best practice and the temporal and spatial footprint of the development should be kept to a minimum. In particular, care must be taken in the vicinity of the drainage lines and existing roads must be used as much as possible for access during construction.
- The boundaries of the development footprint areas are to be clearly demarcated and it must be ensured that all activities remain within the demarcated footprint area.
- Wetland areas where water birds frequent to be treated as sensitive areas, best to be avoided.
- Bird markers to be placed every 50m on the line where it occurs in the vicinity of water bodies (Avifauna Report, Rodney Chrisford, 2015).
- Provide adequate briefing for site personnel.
- Any bird nests that are found during the construction period must be reported to the Environmental Control Officer (ECO).
- The above measures must be covered in a site specific EMPr and controlled by an ECO.

Cumulative impacts: Expected to be moderate. Portions of the habitat is relatively unique within the landscape. Some Red Data species could be displaced temporarily by the habitat transformation that will take place as a result of the construction and operation of the proposed development.

Residual Risks: None anticipated provided that the mitigation measures are implemented correctly and rehabilitation of the site is undertaken.

Avifaunal Impact Assessment: Disturbance of birds

Nature: Species residing within this landscape often experience varying degrees of disturbance. As a result, disturbance of birds by the proposed substation and power line is anticipated to be of low significance as birds will move away from the area temporarily. Species sensitive to disturbance and ground-nesting species resident within the development footprint will be particularly susceptible.

Game reserves and game lodges attract a large amount of visitors and foreign currency to the area. Taking this in to consideration it would be advisable to consult the owners in regard to the installation of bird flight diverters being attached to the transmission power lines that cross their property to ascertain if the avian impact risks are greater than the aesthetic impact, this would be dependent on the route that is taken and the requirements of the owners. The level of disturbance of birds would be similar for both alternatives, but due to the additional length of Alternative 2, the impact may be more than for Alternative 1.

CONSTRUCTION PHASE		
Rating of Impacts	**Without mitigation**	**With mitigation**
Probability	Definite (5)	Highly Probable (4)
Duration	Short Duration (2)	Short Duration (2)
Extent	Limited to Local Area (2)	Limited to Site (1)
Magnitude	Moderate (6)	Low (4)
Significance	**50 (moderate)**	**28 (low)**
Status (positive or negative)	Negative	Negative
OPERATIONAL PHASE		
Probability	Probable (3)	Improbable (2)
Duration	Permanent (5)	Permanent (5)
Extent	Limited to Site (1)	Limited to Site (1)
Magnitude	Moderate (6)	Low (4)
Significance	**36 (moderate)**	**20 (low)**

Status (positive or negative)	Negative	Negative
Reversibility	Moderate	High
Irreplaceable loss of resources?	Low	Low
Can impacts be mitigated?	Yes	
NO GO Option	A No Go Option will not add to the disturbance of bird life.	

Mitigation:

- Owners of Game Reserves to be consulted to estimate if and where there is a need for bird flight diverters being attached to the transmission power lines that cross their properties (Avifauna Report, Rodney Chrisford, 2015).
- All construction and maintenance activities must be carried out according to the generally accepted environmental best practice and the temporal and spatial footprint of the development should be kept to a minimum. In particular, care must be taken in the vicinity of the drainage lines and existing roads must be used as much as possible for access during construction.
- The boundaries of the development footprint areas are to be clearly demarcated and it must be ensured that all activities remain within the demarcated footprint area.
- Wetland areas where water birds frequent to be treated as sensitive areas, best to be avoided.
- Bird markers to be placed every 50m on the line where it occurs in the vicinity of water bodies (Avifauna Report, Rodney Chrisford, 2015).
- Strict control must be maintained over all activities during construction, in line with an approved Construction EMPr.
- During Construction, if any of the Red Data species identified in this report are observed to be roosting and/or breeding in the vicinity, the ECO must be notified.
- Contractors and working staff should stay within the development footprint and movement outside these areas including avian micro-habitats must be restricted. Water bodies are of particular importance and best avoided by personnel.
- Driving must take place on existing roads and a speed limit of 30km/h must be implemented on all roads running through the study area during all phases.

Cumulative impacts: Impact on birds is expected to be of moderate significance. Species are particularly sensitive to disturbance during the breeding season and this must be borne in mind during both the construction and operational (maintenance) phases.

Residual Risks: None anticipated provided that the mitigation measures are implemented correctly and rehabilitation of the site is undertaken.

Avifaunal Impact Assessment: Electrocution of birds on power line

Nature: Electrocution of birds on associated overhead power lines is an important cause of mortality for a variety of bird species particularly storks, cranes and raptors in South Africa.

The design of the transmission line and associated pylons also has a bearing on the risks to certain avian species. The earthing conductors create one of the biggest risks as it is thinner than the transmission conductors and therefore not as visible to birds in flight. Bird excreta on the infrastructure can also have a negative impact on the transmission lines causing possible power interruptions. Electrocution of birds on pylons will depend on the particular design of the pylon to be utilized for the project, the risks to the birds is determined by the phase to phase and phase to earth clearances (Avifauna Report, Rodney Chrisford, 2015)..

Nesting and roosting of birds on pylon structures can have a positive impact on avifauna, but it could also have a negative affect by causing electrical faults due to added weight, shorts due to excreta and possible fire risks from nesting material. Avian species that are most consistently affected by over head transmission lines are water birds that congregate at wetlands and commute between them in flocks, examples being large and / or fast flying species examples such as ducks, geese, flamingos, storks, herons and waders that have a high collision rate. Game birds and rails have less exposure but are still highly susceptible. Canes, storks, bustards korhaans which are large heavy bodied, flocking and low flying are also highly susceptible

to collisions with over head transmission power lines (Avifauna Report, Rodney Chrisford, 2015). The potential for this impact is similar for both alternatives, but due to the additional length of Alternative 2, the impact may be more than for Alternative 1.

OPERATIONAL PHASE		
Rating of Impacts	**Without mitigation**	**With mitigation**
Probability	Probable (3)	Improbable (2)
Duration	Long term (4)	Long term (4)
Extent	Limited to Local Area (2)	Limited to Local Area (2)
Magnitude	Moderate (6)	Low (4)
Significance	**36 (moderate)**	**20 (low)**
Status (positive or negative)	Negative	Negative
Reversibility	Moderate	High
Irreplaceable loss of resources?	Low	Low
Can impacts be mitigated?	Yes	
NO GO Option	A No Go Option will not result in an increase in the electrocution of birds.	

Mitigation:

- All relevant perching surfaces should be fitted with bird guards and perch guards as deterrents.
- Installation of artificial bird space perches and nesting platforms, at a safe distance from energised.
- Bird markers to be installed in areas of water bodies and where property owners have indicated the occurrence of breeding pairs or bird colonies (Avifauna Report, Rodney Chrisford, 2015).

Cumulative impacts: The impact assessment found the impact of electrocution to be of moderate significance after the mitigation in the form of bird friendly structures.

Residual Risks: None anticipated provided that the mitigation measures are implemented correctly and rehabilitation of the site is undertaken.

Avifaunal Impact Assessment : Summary of collisions of birds with the power line Routes A1 and A2

Nature: Collisions are the biggest single threat posed by transmission power lines to birds in Southern Africa. The Red Data species that are vulnerable to power line collisions are generally long living, slow reproducing species under natural conditions. The potential of collisions of birds exists equally for both alternatives, but due to the additional length of Alternative 2, the impact may be more than for Alternative 1.

OPERATIONAL PHASE		
Significance	**Without mitigation**	**With mitigation**
Collisions with Route A1	39 (moderate)	20 (low)
Collisions with Route A2	52 (moderate)	30 (moderate)
Status (positive or negative)	Negative	Negative
Reversibility	Moderate	High
Irreplaceable loss of resources?	Moderate	Low
Can impacts be mitigated?	Yes	
NO GO Option	A No Go Option will not change the status quo of bird collisions in the area.	

Mitigation:

- Mark sections of line in high sensitivity areas with anti-collision marking devices (diurnal and nocturnal diverters) to increase the visibility of the power line and reduce likelihood of collisions.
- Marking devices should be spaced 10 m apart in areas where the line is located in close proximity of water bodies, and where large winged birds are known to breed.
- Marking devices include spiral vibration dampers, strips, Firefly Bird Flight Diverters, bird flappers, aerial marker spheres, ribbons, tapes, flags and aviation balls.
- Construction of the power line in close proximity to other existing lines will reduce the cumulative impacts and collision risk.

Cumulative impacts: Various species require specific conditions for breeding, resulting in very few successful breeding attempts, or breeding might be restricted to very small areas. These species have not evolved to cope with high adult mortality. Therefore, consistent high adult mortality over an extensive period could have a serious effect on a population's ability to sustain itself in the medium to long term.

Residual Risks: Low risk anticipated provided that the mitigation measures are implemented correctly and rehabilitation of the site is undertaken.

Impact on Wetlands and River courses:

Degradation of wetlands areas & drainage systems

Nature: Construction activities (i.e. excavations and vegetation clearing) expose soil to environmental factors including rainfall and wind which can lead to the removal of topsoil resulting in soil erosion and the deposition of sediment along the banks and into surrounding watercourses. Sedimentation poses a risk to the geomorphologic/functional integrity of these systems (Gouritz River System: Upper Gamka River tributaries in the Quaternary Catchments as well as the Olifants River and its tributaries in the Quaternary Catchments , Southern Cape Coastal Rivers: Upper Maalgate River and Upper Keurbooms River, Gamtoos River System: Upper Groot/Sout River tributaries in the Quaternary Catchments and some valley-bottom/floor wetlands that are largely associated with the rivers as well as some seeps and pans. *(Wetlands Report, Blue Science, 2015)*

The habitat integrity of the rivers range from being largely natural (upper reaches of the larger rivers as well as the smaller streams) to being in the seriously modified ecological state (lower reaches of the larger river systems). The riparian habitat of these rivers tends to be more impacted by the direct impact of the surrounding land use activities which has resulted in removal of the natural indigenous vegetation and the subsequent growth of invasive alien plants. Within the instream habitat, water abstraction and flow modification have the most impact, particularly on the lower reaches. The alternative corridor with the least potential impact on the freshwater features in the area is likely to be the more direct route (Alternative 1) as it would need to cross fewer rivers than the Alternative 2 route. In addition, it would avoid more sensitive areas crossed by the Alternative 2 corridor such as the many smaller tributaries and associated wetlands of the Kammanassie River in the Little Karoo as well as the large area of pans near Beaufort West. The alignment of the route within the corridor could also be determined to minimise the potential impact on the freshwater features within the study area. With mitigation, Alternative 1 is likely to have an impact of a very low significance on the freshwater features while Alternative 2 is likely to have an impact of a low impact. *(Wetlands Report, Blue Science, 2015)*

CONSTRUCTION PHASE		
Rating of Impacts	**Without mitigation**	**With mitigation**
Probability	Definite (5)	Highly probable (4)
Duration	Medium-term (3)	Medium-term (3)
Extent	Limited to Local Area (2)	Limited to Local Area (2)
Magnitude	High (8)	Moderate (6)
Significance	**65 (high)**	**44 (moderate)**

Status (positive or negative)	Negative	Negative
OPERATIONAL PHASE		
Probability	Highly probable (4)	Probable (30)
Duration	Permanent (5)	Permanent (5)
Extent	Limited to Local Area (2)	Limited to the Site (1)
Magnitude	High (8)	Low (4)
Significance	**60 (high)**	**30 (moderate)**
Status (positive or negative)	Negative	Negative
Reversibility	Low	Moderate
Irreplaceable loss of resources?	Moderate	Low
Can impacts be mitigated?	Yes	
NO GO Option	A No Go Option will not change the status quo of wetlands and rivers in the area.	

Mitigation:

- A water use authorization may need to be obtained from the Department of Water and Sanitation: Western Cape Regional Office for approval of the water use aspects of the proposed activities. (Wetlands Report, Blue Science, 2015).
- Where possible the pylons must be constructed outside of drainage channels or at their narrowest point;.
- Use existing tracks and roads to gain access to the work servitude as much as possible

Cumulative impacts: Expected to be moderate, should mitigation measure not be implemented as changes made to the bed or banks of watercourse channels will cause unstable channel conditions causing erosion, meandering, increased potential for flooding and movement of bed material, which will result in property damage adjacent to and downstream of the site.

Residual Risks: None anticipated provided that the mitigation measures are implemented correctly and rehabilitation of the site is undertaken.

Pollution of water courses and soil

Nature: Mismanagement of waste and pollutants like hydrocarbons, construction waste and other hazardous chemicals will result in these substances entering and polluting sensitive natural environments either directly through surface runoff during rainfall events, or subsurface water movement. The impacts would be the similar for Alternative 1 and Alternative 2, with a slightly higher risk for Alternative 2 due to the additional length of the line.

CONSTRUCTION PHASE		
Rating of Impacts	**Without mitigation**	**With mitigation**
Probability	Definite (5)	Highly probable (4)
Duration	Medium-term (3)	Medium-term (3)
Extent	Limited to Local Area (2)	Limited to Local Area (2)
Magnitude	High (8)	Moderate (6)
Significance	**65 (high)**	**44 (moderate)**
Status (positive or negative)	Negative	Negative
OPERATIONAL PHASE		
Probability	Highly probable (4)	Probable (3)
Duration	Permanent (5)	Permanent (5)
Extent	Limited to Local Area (2)	Limited to Site (1)
Magnitude	High (8)	Low (4)
Significance	**60 (high)**	**30 (moderate)**
Status (positive or negative)	Negative	Negative
Reversibility	Low	Moderate
Irreplaceable loss of resources?	Moderate	Low

Can impacts be mitigated?	Yes
NO GO Option	A No Go Option will not add to pollution of water courses and soil within the area.

Mitigation:

- All waste generated during construction is to be disposed of as per the Environmental Management Programme and no washing of paint brushes, containers, wheelbarrows, spades, picks or any other equipment adjacent or in drainage channel is permitted.
- Proper management and disposal of construction waste must occur during the lifespan of the project, including during maintenance of the power lines and substations.
- No release of any substance i.e. cement, oil, that could be toxic to fauna or faunal habitats within the watercourses.
- Portable toilets must be placed 30m away from the edge of the channels.

- Do not locate the construction camp or any depot for any substance which causes or is likely to cause pollution within a distance of 50m from a channel.

  Spillages of fuels, oils and other potentially harmful chemicals must be cleaned up immediately and contaminants properly drained and disposed of using proper solid/hazardous waste facilities (not to be disposed of within the natural environment). Any contaminated soil must be removed and the affected area rehabilitated immediately – consult with a wetland/aquatic specialist if spills occur.

Cumulative impacts: Expected to be moderate, should mitigation measures not be implemented. The impacts would be the similar for Alternative 1 and Alternative 2.

Residual Risks: None anticipated provided that the mitigation measures are implemented correctly and rehabilitation of the site is undertaken.

Heritage Impacts

Destruction/Alteration of Heritage artefacts or features		
Nature: It has been determined that only a very few sites, features or objects of cultural significance dating to the historic period occur sporadically all over the region. As these features are all visible**, it would be easy to avoid them** in the unlikely change that some would occur near the power line route or within the proposed substation site. Rock shelters with rock art and stone age archaeological deposits may occur in the mountains. Early, Middle and Later Stone Age scatters near water sources and in proximity to rocky outcrops, etc. Historical archaeological remains may be located around farmsteads. Remnants of historic roads and passes are located in the area. Cemeteries and isolated graves are located in the area, as associated with settlements and farms. (HIA Report, ACO Associates, 2015) he impacts would be the similar for Alternative 1 and Alternative 2, apart from the fact that Alternative 2 is a much longer line. No preference was given by the HIA Specialists to either alternative.		
CONSTRUCTION PHASE		
Rating of Impacts	**Without mitigation**	**With mitigation**
Probability	Improbable (2)	Highly improbable (1)
Duration	Short Duration (2)	Short Duration (2)
Extent	Limited to the region (3)	Limited to the Local Area (2)
Magnitude	Minor (2)	Minor (1)
Significance	**14 (low)**	**5 (low)**
Status (positive or negative)	Negative	Neutral
OPERATIONAL PHASE		
Probability	Highly improbable (1)	Highly improbable (1)
Duration	Short Duration (2)	Short Duration (2)
Extent	Limited to the region (2)	Limited to the region (2)
Magnitude	Minor (1)	Minor (1)

Significance	**5 (low)**	**5 (low)**
Status (positive or negative)	Neutral	Neutral
Reversibility	Moderate	High
Irreplaceable loss of resources?	Low	Low
Can impacts be mitigated?	Yes	
NO GO Option	A No Go Option will not add to the destruction of any heritage resources within the area.	
Mitigation: As per the study, no heritage features or artefacts are expected in the study area that cannot be avoided, however should any archaeological sites or graves be exposed during construction work, it must immediately be reported to a heritage practitioner so that an investigation and evaluation of the finds can be made. *The NID was submitted to the Heritage Western Cape, who in their comments did not request palaeontological studies for either lines. They have requested that more detail of the Archaeology and Visual Impacts is included in the EIA for the Blanco-Droerivier line. What this means, is that HWC does not need specialist palaeontological reports for either lines.*		
Cumulative impacts: None anticipated. There are no anticipated fatal flaws with regard the construction of the powerline. This desktop review concludes that there are no archaeological reasons to exclude the use of any of the proposed powerline alternatives. (HIA Report, ACO Associates, 2015)		
Residual Risks: None anticipated provided that the mitigation measures are implemented.		

Visual Impacts

Visual impacts		
Nature: A medium visual sensitivity prevails in the region where natural vegetation is the principle land cover. These areas are regarded as having a natural landscape character The proposed project will be exposed and clearly visible and it is expected to be in contrast with the existing characteristics of the landscape. The negative visual impact is pronounced in areas of eco-reserves, mountainous areas and where tourist attractions and facilities are located. The impact is of particular concern where land owners already have power line infrastructure on their properties. Servitude widths between new and existing lines must be taken into consideration. During construction it is expected that most of the impacts will revolve around the damaging of vegetation surrounding the tower footprint. Foundation excavation will expose the underlying soil and will impact on the natural features of the landscape. The presence of a workforce in the servitude will place emphasis on the construction activity and will attract a higher level of attention. The construction of towers is considered low intensity construction as the damage to the vegetation is considered localised and easily rehabilitated. One aspect that can cause significant impacts on both the landscape and the visual receptors is the clearing of vegetation in the servitude. This often results in a very distinct linear corridor that is highly visible. This action removes vegetation that often contributes to the quality of the natural landscape. The significance of vegetation clearance will be a function of how long the section of clearance is, how visible it is from sensitive viewpoints and to what degree it will impact on the character of the landscape. The operational phase will be marked by the commissioning of the power line. The rhythmic spacing of towers/poles across the landscape may cause visual intrusion due to its unfamiliar character, imposing scale and possible servitude clearance that will emphasise the corridor. *(VIA Report, i-scape May 2015)* The potential for a negative visual impact is similar for both alternatives, but due to the additional length of Alternative 2, the impact will be more than for Alternative 1.		
CONSTRUCTION PHASE		
Rating of Impacts	**Without mitigation**	**With mitigation**
Probability	Definite (5)	Highly probable (4)
Duration	Permanent (5)	Permanent (5)
Extent	Minor (2)	Minor (2)
Magnitude	High (8)	Moderate (6)
Significance	**75 (high)**	**52 (moderate)**
Status (positive or negative)	Negative	Negative
OPERATIONAL PHASE		

Probability	Highly probable (4)	Highly probable (4)
Duration	Permanent (5)	Permanent (5)
Extent	Limited to the Local Area (2)	Minor (2)
Magnitude	High (8)	Low (4)
Significance	**60 (high)**	**44 (moderate)**
Status (positive or negative)	Negative	Negative
Reversibility	Low	Moderate
Irreplaceable loss of resources?	Moderate	Low
Can impacts be mitigated?	Yes, to some extent	
NO GO Option	A No Go Option will mean no negative visual impact. Tourism, views and land values will remain unchanged by the Option.	

Mitigation:

- Screen planting along the perimeter of the substation will greatly assist in the concealment of the substation.
- Locate construction camps and stockyards in areas that are already disturbed instead of stripping more vegetation to allow for these facilities. It will be most preferred to locate the construction camps away from farm houses, tourist attractions and pristine areas.
- Establish limits of disturbances during construction through demarcating of the tower footprints in order to prevent unnecessary damage to vegetation;
- Keep to existing road infrastructure as far as possible to minimise the physical damage to vegetation in the power line servitude;
- Implement rehabilitation of disturbed areas as soon as possible to limit the duration of exposed surfaces and the risk of erosion; and
- Previously rehabilitated areas must be monitored to prevent the infestation of weeds that may become an unsightly feature.
- Servitude widths between new and existing lines must be taken into consideration

Cumulative impacts: Expected to be moderate to high, should the recommended mitigation measures not be adequately implemented. The landscape character is such that it generally has a very low screening capacity and that major electrical infrastructure will be easily visible, in particular in the Karoo. Cumulative visual impact from numerous power lines in parallel will increase its visual dominance in the landscape and may reach a threshold point. The landscape and visual receptors in the study area is considered to be generally highly sensitive. This will be narrowed down during a site investigation to identify the areas of highest to lowest sensitivity. (VIA Report, i-scape May 2015)

Residual Risks: None anticipated provided that the mitigation measures are implemented correctly and rehabilitation of the site is undertaken.

Impacts on traffic and local roads

Roads and transport
Nature: *Traffic will be congested as a result of construction activities. In addition, traffic increase can lead to road damage, erosion, accidents and even traffic delays. Construction machinery and heavy vehicles are likely to generate dust which is likely to be perceptible by adjacent residents. Trucks may potentially distribute dust along internal access roads.* The traffic impact is will occur for both alternatives, but due to the additional length of Alternative 2, the impact wil entail more (lower order) roads than for Alternative 1. Also, the area between Uniondale, Willowmore and Rietbron has roads that are mostly used by farmers and tourists, while the section between De Rust and Beaufort West is used by most vehicles travelling between the coast and the northern provinces. This means that heavy load vehicles will occur in rural areas where traffic volumes are generally lower, roads may be of a lower hierargy and livestock may cross the roads. Congestion would be a problem for Alternative 1 along the N12, and for Alternative 2 along the N9 sections. Howeverm during construction, **Meiringspoort** is the main problem area and vehicles carrying abnormal loads should be avoided at all cost. Regular flooding during rainy seasons (winter months) will impact on any vehicles transporting material to the sites for the construction of the Alternative 1 alignment. Meiringspoort furthermore has narrow river passages with a winding road that would make it impossible for heavy vehicles to transport materials on without impacting on traffic flow. Alternative 2 would avoid this problem, but in the northern section (where it turns away from the N9 and passes WIllowmore and Rietbron) the roads are mostly farm roads and not designed for heavy vehicles.

CONSTRUCTION PHASE		
Rating of Impacts	**Without mitigation**	**With mitigation**
Probability	Probable (3)	Improbable (2)
Duration	Limited to Local Area (2)	Limited to Site (1)
Extent	Low (4)	Minor (2)
Magnitude	Moderate (6)	Low (4)
Significance	**36 (moderate)**	**14 (low)**
Status (positive or negative)	Negative	Negative
OPERATIONAL PHASE		
Probability	Probable (3)	Improbable (2)
Duration	Limited to Local Area (2)	Limited to Site (1)
Extent	Low (4)	Minor (2)
Magnitude	Moderate (6)	Low (4)
Significance	**36 (moderate)**	**14 (low)**
Status (positive or negative)	Negative	Negative
Reversibility	Low	Moderate
Irreplaceable loss of resources?	Moderate	Low
Can impacts be mitigated?	Yes	
NO GO Option	A No Go Option means no additional traffic to the area and will prevent disruption on roads.	

Mitigation:

- Vehicular movement of construction vehicles beyond the property boundaries of the site should be outside the am and pm peak hours.
- Where new access roads are required, they should disturb as limited an area as possible
- Areas demarcated as being out of bounds for construction personnel must be sign posted and must be regarded strictly as "no-go' areas. No contractor's personnel, vehicles or machinery may access these areas. Very strict control must be exercised over this aspect of construction activities
- Ensure that the necessary signage and traffic measures are implemented for safe and convenient access to the site from. Measures must also be put in place to ensure that these access points do not get built up with mud or sand.

Cumulative impacts: Expected to be moderate to high, should the recommended mitigation measures not be adequately implemented. Traffic in Meiringspoort is already problematic in high season and construction should not take place during the holiday periods or over weekends, to avoid adding to the problem cumulative to other traffic.

Residual Risks: None anticipated provided that the mitigation measures are implemented correctly and rehabilitation of the site is undertaken.

Social and Socio-economic Impacts

Impact on Property values
Nature: Property values may be impacted upon negatively due to the visual impact. The impact is of concern where land owners already have power line infrastructure on their properties. The rhythmic spacing of towers/poles across the landscape may cause visual intrusion due to its unfamiliar character, imposing scale and possible servitude clearance that will emphasise the corridor. *(VIA Report, i-scape May 2015).* Property values may be impacted upon along Alternative 1 and for Alternative 2 and in particular

where power lines already cross the properties. Due to the longer length of Alternative 2, the impact could be slightly more, but this would depend on the characteristics of the specific property and the surrounding land uses. The actual distance of the line from houses and the backdrop against which the line will impact upon, would play a role in determining the actual effect on property values. Distances between servitudes (where other lines occur on the same property) also plays a role.

Negotiations will be undertaken by Eskom's Land & Rights Department, after the environmental authorisation of the EIA is obtained. The securing the servitude or title of the portions of land required for the proposed project will be undertaken with the following activities(SIA Report, Amina Ismail, April 2015):

- The legal boundaries are identified for each property affected by the project;
- The legal ownership of each property is identified;
- An independent property evaluator is appointed; and
- Negotiations by Transmission negotiators with each legal landowner, statutory bodies and mineral right holders.

Rating of Impacts	Without mitigation	With mitigation
	Without mitigation	**With mitigation**
CONSTRUCTION PHASE		
Rating of Impacts	**Without mitigation**	**With mitigation**
Probability	Improbable (2)	Improbable (2)
Duration	Short-term (3)	Very short-term (3)
Extent	Limited to the Local Area (2)	Limited to Local Area (2)
Magnitude	Moderate (6)	Moderate (6)
Significance	**22 (low)**	**22 (low)**
Status (positive or negative)	Positive	Positive
OPERATIONAL PHASE		
Probability	Improbable (2)	Probable (3)
Duration	Very short-term (1)	Very short-term (1)
Extent	Limited to Site (1)	Limited to Site (1)
Magnitude	Low (4)	Low (4)
Significance	**12 (low)**	**18 (low)**
Status (positive or negative)	Negative	Negative
Reversibility	Low	Low
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	Yes	
NO GO Option	A No Go Option will not change the status quo of land values.	

Mitigation:

- Negotiations to be undertaken by Eskom's Land & Rights Department, after the environmental authorisation of the EIA is obtained.
- All adjacent landowners must be informed of the construction processes prior to commencement of construction activities.
- An independent property valuer must be appointed during negotiations.

Cumulative impacts: Possible negative low impact.

Residual Risks: Low risk anticipated, provided that the mitigation measures are implemented correctly.

Impact on Job opportunities

Nature: *The municipalities' residents and businesses therefore can potentially benefit from work opportunities and expenditure. However, contractors appointed by Eskom may not necessarily come from these areas. Contractors usually have skilled personnel to work on the project. It is possible that where labour may be sourced from local communities, it will be to perform unskilled work such as land clearing and erecting fences.* (SIA Report, Amina Ismail, April 2015)

The number of job opportunities would be comparable for both Alternatives, but because the Alternative 2 option entails a longer line, service providers (manufacturers of towers, cable etc) would in relation have access to more opportunities for Alternative 2.

Rating of Impacts	Without mitigation	With mitigation

	Without mitigation	With mitigation
CONSTRUCTION PHASE		
Rating of Impacts	**Without mitigation**	**With mitigation**
Probability	Improbable (2)	Improbable (2)
Duration	Medium-term (3)	Very short-term (3)
Extent	Limited to the Local Area (2)	Limited to Local Area (2)
Magnitude	Moderate (6)	Moderate (6)
Significance	**22 (low)**	**22 (low)**
Status (positive or negative)	Positive	Positive
OPERATIONAL PHASE		
Probability	Improbable (2)	Probable (3)
Duration	Very short-term (1)	Very short-term (1)
Extent	Limited to Site (1)	Limited to Site (1)
Magnitude	Low (4)	Low (4)
Significance	**12 (low)**	**18 (low)**
Status (positive or negative)	Positive	Positive
Reversibility	Low	Low
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	Yes	
NO GO Option	No Go Option will not provide job opportunities in the area. This is a negative impact. NO GO Option A No Go Option will not change the status quo of land values. The project is intended to strengthen the network. With a No GO option, this will not be possible and the occurrence and frequency of power interruptions will an increased risk. Not to construct a line in the area between Droerivier and Blanco will not be in line with the SIPS for the country. This is the main negative impact of a No Go Alternative.	

Mitigation:

- *Eskom to provide numbers and skills of jobs in the three phases, locally and nationally by contractors. Also procurement targets for locals and nationally.*
- All adjacent landowners must be informed of the construction processes prior to commencement of construction activities.
- Adjacent land owners must be informed timeously of any service stoppages in their areas.
- Notification must include possible timeframes for stoppages.
- Consequences of such stoppages must be clearly indicated to all surrounding/affected land owners.
- Affected land owners must be timeously informed of any/all maintenance of the bulk water services supply which may result in service stoppages to their properties. Again this must include possible timeframes so alternatives

Cumulative impacts: Expected positive impact to be low.

Residual Risks: None anticipated provided that the mitigation measures are implemented correctly and local labour and suppliers be given the opportunity to participate.

Health issues **Impact of Electro-magnetic fields**
Nature: The infrastructure may have a health impacts from electric and magnetic fields. According to Eskom (Eskom, 2015a), the electric field at the boundary of the servitude for its highest voltage transmission line (of 765 kV) is 3kV/m, which is lower than the maximum limit of 5kV/m continuous general public exposure recommended by the International Radiation Protection Association (IRPA) of the World Health Organisation (WHO). The power line in this project therefore is not expected to cause any health effects where communities are located at the boundary or outside the Eskom servitude. From the information obtained from the IRPA and Eskom there is insufficient evidence that electric or magnetic fields are detrimental to communities living outside the servitudes of the 400kV Transmission lines. (SIA Report, Amina Ismail, April 2015). This is valid for both Alternatives.
CONSTRUCTION PHASE

Rating of Impacts	Without mitigation	With mitigation
Probability	Improbable (2)	Improbable (2)
Duration	Medium-term (5)	Very short-term (1)
Extent	Limited to the Local Area (1)	Limited to Site (1)
Magnitude	Low (4)	Low (4)
Significance	**32 (moderate)**	**12 (low)**
Status (positive or negative)	Negative	Negative
OPERATIONAL PHASE		
Probability	Improbable (2)	Improbable (2)
Duration	Very short-term (1)	Very short-term (1)
Extent	Limited to Site (1)	Limited to Site (1)
Magnitude	Minor (2)	Minor (2)
Significance	**8 (low)**	**8 (low)**
Status (positive or negative)	Negative	Negative (Negligible)
Reversibility	Low	Moderate
Irreplaceable loss of resources?	Moderate	Low
Can impacts be mitigated?	Yes	
NO GO Option	No Go Option will not bring additional electromagnetic fields (health risk) to the area.	

Mitigation:

- Eskom Standards and Specifications to be followed during construction, maintenance and operation

Cumulative impacts: The power line in this project therefore is not expected to cause any health effects where communities are located at the boundary or outside the Eskom servitude. From the information obtained from the IRPA and Eskom there is insufficient evidence that electric or magnetic fields are detrimental to communities living outside the servitudes of the 400kV Transmission lines.

Residual Risks: None anticipated

Impact on Tourism & Local Economy

Nature:

Tourism may be impacted upon negatively mostly due to the visual impact. From the point of view of receptors, including local residents and tourists, the presence of a transmission line may negatively affect the sense of place of natural areas, potentially negatively affecting eco-tourism attractions such scenic hiking trails, eco-adventures, and the like. This could have negative social and economic consequences, such as loss of revenue for business enterprises, loss of employment and reduced economic contributions to local GDP (Socio-Economic Report, EMS, 2015) The potential for a negative impact would be comparable for both Alternatives, but the number of known tourist facilities/features are more than along the Alternative 2 route. A direct impact can be avoided through mitigation and careful placement of towers, to ensure that access to facilities is not hindered and to avoid spoiling the views from rooms at B&Bs and lodges.

The impact of the construction of the transmission lines can be subdivided in two categories. One is the impact of the construction cost, purchasing of servitude and operational expenditure of the transmission lines on the surrounding local municipalities and secondly the impact on the broader economy by strengthening the power availability to a growing economy. The local economy will also benefit through aspects like accommodation, retail, entertainment, etc. Money can also be injected into the pockets of the landowners by buying the servitude area for the transmission line. (Socio-Economic Report, EMS, 2015) Potential economic losses will be limited in the Klein and Groot Karoo sections where animals can still graze the land under the transmission lines and as such no real loss in farming activity and production is expected6. There are sections in the Klein Karoo in the Oudtshoorn Municipality where some economic losses could occur. The boost of the economy during construction phase would be to a comparable benefit for Alternative 1 or 2, in particular at towns such as Rietbron and Willowmore that are located away from the most travelled routes,.

The proposed Alternative 1 crosses the Olifantsriver just south of the N12 with some prime irrigation land that may be impact on. However, the prime irrigation section is only about 2.3 km long and there is an existing transmission line. Another prime agricultural section that may be impacted is just west of the Kammanassie Dam. This is about 1.3 km wide. It is expected that most of the ostrich, small stock farming activities and cattle will be able to continue unhindered by the transmission lines. From a pure economic point of view, with cost savings in mind, the shortest route, i.e. Alternative 1 can be recommended. (Socio-Economic Report, EMS, 2015)

Negotiations will be undertaken by Eskom's Land & Rights Department, after the environmental authorisation of the EIA is obtained. The securing the servitude or title of the portions of land required for the proposed project will be undertaken with the following activities(SIA Report, Amina Ismail, April 2015):

- The legal boundaries are identified for each property affected by the project;
- The legal ownership of each property is identified;
- An independent property evaluator is appointed; and
- Negotiations are conducted with each legal landowner, statutory bodies & mineral right holders.

Rating of Impacts	**Without mitigation**	**With mitigation**
	Without mitigation	**With mitigation**
CONSTRUCTION PHASE		
Rating of Impacts	**Without mitigation**	**With mitigation**
Probability	Improbable (2)	Improbable (2)
Duration	Short-term (3)	Very short-term (3)
Extent	Limited to the Local Area (2)	Limited to Local Area (2)
Magnitude	Moderate (6)	Moderate (6)
Significance	**22 (low)**	**22 (low)**
Status (positive or negative)	Positive	Positive
OPERATIONAL PHASE		
Probability	Improbable (2)	Probable (3)
Duration	Very short-term (1)	Very short-term (1)
Extent	Limited to Site (1)	Limited to Site (1)
Magnitude	Low (4)	Low (4)
Significance	**12 (low)**	**18 (low)**
Status (positive or negative)	Negative	Negative
Reversibility	Low	Low
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	Yes	
NO GO Option	The No go Option will prevent negative impacts on tourism (due to disturbance of views, road congestion, noise or dust) No Go Option will not provide job opportunities through tourism in the area during construction. This is a negative impact. A No Go Option will not change the status quo of land values. The project is intended to strengthen the network. With a No GO option, this will not be possible and the occurrence and frequency of power interruptions will an increased risk which will also impact on tourism in the region. Not to construct a line in the area between Droerivier and Blanco will not be in line with the SIPS for the country. This is the main negative impact of a No Go Alternative.	

Mitigation:

- Visual impacts should be mitigated as per the recommendations of the VIA Specialist Report.
- Benefits from construction period to be maximised by employing local labour and service providers, including accommodation, transportation and entertainment.
- An independent property valuer must be appointed during negotiations with property owners.

Cumulative impacts: Possible negative low impact, and moderate positive impact.
Residual Risks: Low risk anticipated, provided that the mitigation measures are implemented correctly.

Agricultural Impacts

Agricultural impacts		
Nature: *The construction of a transmission line has isolated impacts on the soil resource, due to the relatively small, separated footprints of the pylons. However, if an access road is constructed, especially in steeper areas or where erodible soils occur, the possibility of accelerated soil erosion is a reality. Regarding cultivation and agricultural potential, the main susceptible areas would be areas of irrigation, such as where the transmission line crosses rivers (D.G. Paterson Report Number GW/A/2015/20 March 2015)* *Agricultural activities have been identified along both routes, with a variety of farming produce. Areas of irrigation have been identified along the areas of the Langkloof (Alternative 2) and the area between George and De Rust (Alternative 1). These areas are usually smaller farms than in the Karoo and placement of towers should thus be carefully considered. The impact on stock farming (grazing) would be of lower significance than in crop farming where pivot irrigation is used.*		
CONSTRUCTION PHASE		
Rating of Impacts	**Without mitigation**	**With mitigation**
Probability	Definite (5)	Highly probable (4)
Duration	Permanent (5)	Permanent (5)
Extent	Minor (2)	Minor (2)
Magnitude	High (8)	Moderate (6)
Significance	**75 (high)**	**52 (moderate)**
Status (positive or negative)	Negative	Negative
OPERATIONAL PHASE		
Probability	Highly probable (4)	Highly probable (4)
Duration	Permanent (5)	Permanent (5)
Extent	Limited to the Local Area (2)	Minor (2)
Magnitude	High (8)	Low (4)
Significance	**60 (high)**	**44 (moderate)**
Status (positive or negative)	Negative	Negative
Reversibility	Low	Moderate
Irreplaceable loss of resources?	Moderate	Low
Can impacts be mitigated?	Yes (close consultation with farmers recommended)	
NO GO Option	No Go Option will not impact on agricultural activities such as irrigation, grazing. No loss of land will occur to register servitudes.	
Mitigation: • Specific soil conservation measures, such as contouring, culverts and diversion channels would need to be considered in susceptible areas. In addition, regular monitoring of such roads would need to be carried out. • Care should be taken to avoid any areas where irrigation is currently being practiced. • Keep to existing road infrastructure as far as possible to minimise the physical damage to crops and grazing areas in and around the power line servitude; • Implement rehabilitation of disturbed areas as soon as possible to limit the duration of exposed surfaces and the risk of erosion; and • Previously rehabilitated areas must be monitored to prevent the infestation of weeds that may become an unsightly feature and impact on stock feeding behaviour. • Discuss existing and future planning with farmers, in particular regarding placement of pivot points, crop fields and grazing camps		
Cumulative impacts: Expected to be moderate to high, should the recommended mitigation measures not be adequately implemented.		
Residual Risks: None anticipated provided that the mitigation measures are implemented correctly and rehabilitation of the site		

is undertaken.

7.5 Additional evaluation

As many of the impacts are also subjectively weighted with impacts being visual of nature or perceived to be of a quality of life diminishing nature, consideration must be given to priority of impacts. It will be impossible to continue with any project if every individual's needs are separately considered and the "diminishing background" and cumulative effect is not mentioned.

Projects of this nature (that are part of the modern landscape) tend to disappear into the "background" of the environment, whether physically or perceptually and are furthest away from creating impacts once operational. However the support structures or access routes for maintenance will remain a bio-physical impact. Therefore the choice and alignment of the power line route should be done in such a way that tar roads are followed as far as possible to preserve grazing and irrigation areas, and that maintenance is done responsibly.

Most power lines that traverse large tracks of rural land will impact to a certain degree on the production potential of the land. However, to evaluate this loss a perspective on the production capability of the specific farm/vegetation area must be done in order to establish magnitude of loss the farmer. **For the particular study area from Blanco Substation through the Southern and Klein Karoo, agricultural impacts were identified by I&APs as a very prominent concern. For this reason this additional evaluation ha been included in this Scoping Assessment.**

The agricultural assessment gives the grazing capacity of the affected land areas as:

Table 5. **Grazing potential**

Region	Grazing Potential Large Stock (q)	Grazing Potential Small Stock (q)
Southern Karoo	40-60 ha/lsu	8 – 13 ha/ssu
Klein Karoo	14-20 ha/lsu	3.5 - 6 ha/ssu
Coastal Belt	5-10 ha/lsu	1.5 – 3 ha/ssu

The actual area of the grazing land/irrigation land that is affected in the case of a service road can thus be calculated with the known factors inserted in an equation.

Length of access road = a
Breadth of access road = b
Total ha of access road = a x b/10 000 = c

Total ha of specific farm = p
Grazing Potential = q
Stocking potential of farm = p/q = r animal units

Loss of production area = c

Example:
Farm Bittersweet 1111 GL

Extent: 6 400ha (p)
(q) Grazing potential small stock = 10ha/ssu
Thus:
Stocking potential: p/q = r
6 400ha/10 h per ssu = 640 ssu

Production Loss expected:
Length of service road crossing farm (a) = 8 000 metres
Breadth of service road (b) = 6 meters
Potential productive area lost: a x b = c
8 000m x 6m = 48 00m^2

Expressed as hectares = a x b/10 000 = 48 00/10 000
= 4.8 ha (c)

Production lost: c/p x r
= 4.8/6 400 x 640
= 0.48 ssu

This calculation will change for every farm and carrying capacity. However the example serves to illustrate that production losses for grazing are negligible.

An argument can be raised that irrigation potential lost will be bigger than that of grazing. However the off-set to this argument is that the availability of electricity to drive irrigation pumps and pivots for expansion and the stability of the electrical network exceeds the potential production loss and will be made up by the consistency of electrical supply.

Choices affecting the route were thus based on evaluations that are quantifiable and explicable in terms of sustainability and productivity. The social and cultural impacts can thus be addressed by empirical studies and mitigation strategies, without undue economic and bio-physical constraints.

The purpose of the comparison between the two routes can thus been justified to inform the Relevant Reviewing Authorities of the rationale and the conclusions of the Scoping Report as a Tool in the Environmental Impact Assessment process.

Table 6. Impact Rating Score

	Score before mitigation			Score after mitigation	
Receiving Environment	**BD-1 (Preferred)**	**BD-2 (Alt 2)**	**Explanation**	**BD-1 (Preferred)**	**BD-2 (Alt 2)**
Topography	0	0		0	0
Soils and erosion	1	0	Alternative 1 covers smaller area for sheet erosion to occur	1	0
Geology	0	0		0	0
Agriculture/Stock farming	-1	-1	BD-1 Ostrich farming impacted BD-2 Sheep and goat farming impact	0	0
Settlements/Small towns	-1	0		0	1

Receiving Environment	Score before mitigation BD-1 (Preferred)	BD-2 (Alt 2)	Explanation	Score after mitigation BD-1 (Preferred)	BD-2 (Alt 2)
Agriculture/Irrigation	-1	-1	Alternative 2 may have an influence on possible future expansion of irrigation land	0	0
Nature Reserves:					
Swartberg Nature Reserve(Formal A)	-1	0	Swartberg Nature Reserve has been declared a UNESCO world heritage site.	-1	1
Ruitersbos Nature Reserve(Formal A)	-1	0	BD-1 crosses nature reserve	-1	1
Doring Rivier Wilderness(Formal A)	-1	0	BD-1 crosses nature reserve	-1	1
Witfontein Nature Reserve(Formal A)	0	-1	BD-2 skirts the border of the nature reserve	1	0
Mountain Ranges					
Outeniqua	-1	-1	BD-1 and BD-2 crosses mountain	-1	-1
Swartberg Nature Reserve(Formal A)	-1	0	BD-1 crosses mountain	-1	1
Kamannassie	-1	0	BD-1 crosses mountain	-1	1
Bio Physical Environment					
Endangered Mammals	0	-1	BD-2 in areas of reserves	1	0
Protected	-1	0	BD-1 in areas of reserves		
CBA	-1	-1	BD-1 and BD-2 cross CBA's to a lesser or greater degree. In depth assessment of chosen alternative needed.	-1	-1
Threatened Plant Species	-1	-1	BD-1 and BD-2 in areas of threatened species. In depth determination needed for selected alternative	0	0
Vegetation Types threatened	-1	0	BD-2 does not have any threatened vegetation types (see Botanical Report)	0	1
FEPA Fish Points	-1	0	BD-2 does not encroach on threatened fish species wetlands and rivers	0	1
Wetlands/Amphibians	0	-1	A small deviation will avoid wetlands in BD- 2.	1	0
Heritage Sites					
World Herirage Sites	-1	0	BD-1 cannot avoid crossing a UNESCO site	-1	1
Rock Art	-1	-1	Both routes can be constructed to avoid any damage to rock art. Pylon placing and access is not for public viewing.	0	0
Palaeontological impacts	0	0	No impacts on either routes found	0	0
Visual Impacts					
Visual Impacts	-1	-1	The visual impacts as assessed at the Scoping Level are inconclusive	-1	-1

Receiving Environment	Score before mitigation BD-1 (Preferred)	BD-2 (Alt 2)	Explanation	Score after mitigation BD-1 (Preferred)	BD-2 (Alt 2)
			as to a preferred option between the two routes. An in depth study and mitigation hierarchy can only be established once the route is being investigated in the EIA Phase.		
Public Participation					
Public Participation	-1	-1	Opposition was given to both options	-1	-1
Total	**-17**	**-11**		**-5**	**5**

As illustrated by the table above, there are negative impacts for both alternatives. The table shows that Scores of (-1) (0) and (1) have been allocated to the weighted effect of a route alternative on the receiving environment. When a route has an impact of (-1) it creates a negative impact. A score of (0) indicates no or negligible impact and a score of (1) indicate if an impact can be managed according to the mitigation hierarchy. Thus comparisons between the two routes have indicated that Route 2 (BD2) will have less impacts than Route 1 and more manageable impacts.

The negative impacts that are identified in are to be earmarked for further in depth studies during the EIA Phase. The comment of Cape Nature on the 2015 DSR regarding the practicality of the Alternative 2 (to avoid the Swartberg area) will be investigated in particular since the longer line will have economical and practical consequences that need to be assessed. No additional comments were received from Cape Nature during the 2016 review period.

At this stage Alternative 1 is preferred due to the shorter distance which would mean that it would result in a smaller footprint. The Scoping level assessment has however indicated that this route may impact negatively on sensitive vegetation and intensive farming activities. Loss of vegetation along the Alternative 2 route could result in a loss of farming land and income. The latter situation needs to be evaluated in specialist agricultural and ecological studies. During the Public Participation Process, resistance has been given to both alternatives.

The project is intended to strengthen the network. With a No GO option, this will not be possible and the occurrence and frequency of power interruptions will an increased risk. Not to construct a line in the area between Droërivier and Blanco will not be in line with the SIPS for the country. This is the main negative impact of a No Go Alternative.

8. PLAN OF STUDY FOR ENVIRONMENTAL IMPACT ASSESSMENT

A "plan of study for environmental impact assessment" means a study contemplated in regulation 22 which forms part of a scoping report and sets out how an environmental impact assessment will be conducted. The plan of Study for Environmental Impact Assessment is a document which forms part of a scoping report and sets out how an environmental impact assessment must be conducted and must include:

*i) a description of the **alternatives to be considered** and assessed within the preferred site, including the option of not proceeding with the activity;*
*(ii) a description of the **aspects to be assessed** as part of the environmental impact assessment process;*
*(iii) aspects to be assessed by **specialists**;*
*(iv) a description of the **proposed method of assessing** the environmental aspects, including a description of the proposed method of assessing the environmental aspects including aspects to be assessed by specialists;*
*(v) a description of the proposed **method of assessing duration and significance**;*
*(vi) an indication of **the stages** at which the competent authority will be consulted;*
*(vii) particulars of the **public participation process** that will be conducted during the environmental impact assessment process; and*
*(viii) a description of the **tasks** that will be undertaken as part of the environmental impact assessment process;*
*(ix) **identify suitable measures** to avoid, reverse, mitigate or manage identified impacts and to determine the extent of the residual risks that need to be managed and monitored.*

8.1 Description of Tasks

The following tasks will be completed during the EIAR phase:

i. Environmental Impact Assessment Report;
ii. Specialist Studies; and
iii. Public Participation Process.

Environmental Impact Assessment Report;

After the review period of the Scoping Report, more specific recommendations regarding the two alignment alternatives will be included in the EIAR.

The EIAR will contain all information that is necessary for the competent authority to consider the application and to reach a decision. It will detail the process followed during the EIA Phase including details of the PPP and an assessment of each identified potentially significant impact. A draft Environmental Management Programme (EMPr) for the mitigation of impacts will be provided within the EIAR. The EMPr will attempt to mitigate the potential construction related impacts of the power line development.

Cumulative impacts will be assessed within the entire study area. It will include the assessment of electricity generation, transmission and distribution activities of Eskom and Independent Power Producers.

Preliminary investigations of all potential impacts associated with this proposed project have been undertaken by the project specialists during this Scoping phase. Some specialist

studies, such as the Avi-Faunal study have included a site- walkdown of both alternatives, and collection of on-site and project specific data.

Specialist studies in EIA phase

During the Scoping Phase, the need for further Specialist studies has been identified. At the time of this Scoping report, the following detailed specialist studies are proposed to be undertaken during the EIAR Phase:

- Delineation of the **wetland and river boundaries** of the preferred route using the requisite techniques based upon the latest Wetland Classification systems (SANBI, 2009);
- Indicate suitable **buffer zones** as prescribed by the relevant legislation, policies, conservation plans; and
- Assess the status of the observed **faunal and floral populations** observed for the preferred route.
- Assess the possible impacts on the **Heritage** resources along the preferred route (Paleolontological study was not requested by the Provincial Heritage Agency)
- Assess the **Visual** impact of the recommended line alternative
- Assess the **Traffic Impact** of the recommended route (request from DEA after review of the DSR)
- Assess particular **Social and Socio-economic** impacts of the recommended line route

These specialist studies will be documented and recommendations formulated by the specialists for the proposed development. The full impact of construction activities will be described in the EIAR after the integration of the specialist study findings has occurred. Assumptions made and the specialist will explicitly state any uncertainties and gaps in knowledge. An indication will be provided by the specialist of the methodology used in determining the significance of potential environmental impacts. Envirolution Consulting will ensure that the methodology is consistent across all specialist studies in order to facilitate informed integrated decision making. (Appendix 2 requirement of the EIA Regulations "*a description of the aspects to be assessed as part of the environmental impact assessment process*").

Data collected during the EIAR phase will determine the preferred transmission line route alternative. This will guide the required Water Act registration/licensing process.

Data along the recommended route (that will be required for the Water Act Licence Application in particular) will be collected during the EIA phase of the project. This would assist the consultants to acquire further demographic and socio-economic information with regards to the receiving environment and to build on the initial profiling of the local population's socio-economic characteristics.

Public Participation Process of the EIA phase

During the EIA Phase, additional primary data would be gathered by means of consultation with the stakeholders and affected parties, and linkages with the public participation process.

The social impact assessment team will study and analyse the information gathered by the biophysical studies (e.g. information related to technical, environmental, economic and demographic aspects and land-use changes, impact on other facilities, services, and so forth) done in parallel with the public participation process and social studies. This would assist the

social team to assess the impact of the proposed development on the direct (surrounding communities) and indirect (regional) environment.

Proposed Methodology of Assessing Issues and Alternatives

Activities within the framework of the proposed development and their respective construction and operational phases, give rise to certain impacts. For the purpose of assessing these impacts, the project has been divided into phases from which impacting activities can be identified, namely:

a) Status Quo
The site as it currently stands taking cognisance of the disturbance and the impacts remaining,

b) Construction phase
All the construction and construction related activities on site, until the contractor leaves the site.

c) Operational phase
All activities, including the operation and maintenance of the proposed development.

The activities arising from each of the relevant phases have been included in the tables. The assessment endeavours to identify activities, which require certain environmental management actions to mitigate the impacts arising from them. The criteria against which the activities were assessed are given in the next section.

iii. Assessment Criteria

In accordance with Appendix 3 of the 2014 Regulations, Envirolution Consulting will assess each identified potential significant impact and report the findings in the Environmental Impact Assessment Report (EIAR) and will include:

(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 mitigated;
(k) where applicable, a summary of the findings and recommendations of 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 assessment report;

(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;

(m) based on the assessment, and where applicable, recommendations from specialist reports, the recording of proposed impact management objectives, and the impact management outcomes for the development for inclusion in the EMPr as well as for inclusion as conditions of authorisation;

(n) the final proposed alternatives which respond to the impact management measures, avoidance, and mitigation measures identified through the assessment;

(o) 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

(p) a description of any assumptions, uncertainties and gaps in knowledge which relate to the assessment and mitigation measures proposed;

(q) 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;

(r) where the proposed activity does not include operational aspects, the period for which the environmental authorisation is required and the date on which the activity will be concluded and the post construction monitoring requirements finalised;

(s) 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 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 or affected parties;

(t) where applicable, details of any financial provisions for the rehabilitation, closure, and ongoing post decommissioning management of negative environmental impacts;

(u) an indication of any deviation from the approved scoping report, including the plan of study, including-

(i) any deviation from the methodology used in determining the significance of potential
environmental impacts and risks; and

(ii) a motivation for the deviation;

(v) any specific information that may be required by the competent authority; and

(w) any other matters required in terms of section 24(4)(a) and (b) of the Act.

The assessment of the impacts will be conducted according to a synthesis of criteria required by the Integrated Environmental Management procedure.
See Table 7 below.

Table 7. Assessment Criteria

Criteria	Assessment Rating Scales
Cumulative Impacts	• Low – Environmental resources still have significant capacity to respond to change and withstand additional stress; • Medium - Environmental resources have a reduced capacity respond to change and withstand additional stress; and • High - Environmental resources have no capacity respond to change or withstand additional stress

Criteria	Assessment Rating Scales
Nature	• Positive; • Neutral; and • Negative
Extent (Physical and spatial size of the impact)	• Site - The impact could affect the whole, or a measurable portion of the above-mentioned properties; • Local - The impacted area extends only as far as the activity, e.g. a footprint; and • Regional - The impact could affect the area including the neighbouring farms the transport routes and the adjoining towns.
Intensity	• Low Impact (Negligible alteration of natural systems, patterns or processes or social and cultural functions and processes); • Medium - (Notable alteration of natural systems, patterns or processes or social and cultural functions and processes); and • High - (Severe alteration of natural systems, patterns or processes or social and cultural functions and processes).
Duration The lifetime of the impact; this is measured in the context of the lifetime of the proposed base.	• Short-term (0 to 5 years); • Medium term (6 to 15 years); and • Long term (16 to 30 years).
Probability This describes the likelihood of the impacts actually occurring. The impact may occur for any length of time during the life cycle of the activity, and not at any given time. The classes are rated as follows	• Improbable - The possibility of the impact occurring is very low, due either to the circumstances, design or experience; • Probable - There is a possibility that the impact will occur to the extent that provisions must be made therefore; • Highly probable - It is most likely that the impacts will occur at some or other stage of the development. Plans must be drawn up before the undertaking of the activity; and • Definite - The impact will take place regardless of any prevention plans, and there can only be relied on mitigatory actions or contingency plans to contain the effect.
Significance Significance is determined through a synthesis of impact characteristics. Significance is an indication of the importance of the impact in terms of both physical extent and time scale, and therefore indicates the level of mitigation required.	• No significance - The impact is not substantial and does not require any mitigatory action; • Low - The impact is of little importance, but may require limited mitigation; • Medium - The impact is of importance and therefore considered to have a negative impact. Mitigation is required to reduce the negative impacts to acceptable levels; and • High - The impact is of great importance. Failure to mitigate, with the objective of reducing the impact to acceptable levels, could render the entire development option or entire project proposal unacceptable. Mitigation is therefore essential.

iv. Methodology used in assessing alternatives

Alternatives will be assessed according to the impact of the specific alignment on the surrounding environment. Since the impacts of all three alignments will be the same in generic surroundings, the environment on which these will impact will be the variable which will govern the decision of a recommended alignment. i.e. the sensitive areas through which each route alignment passes.

EIAR Public Participation Process

During the Environmental Impact Assessment phase, the draft EIA report will be made available for public review and comments. All stakeholders and registered I&AP's will be notified via e-mail, fax, SMS's and post (depending on the preferred method of communication by stakeholders and I&AP's). The draft EIA report will be made available for 30 days to the I&AP's and Organs of state.

At the end of the review period of the draft EIA Report, all comments/input from stakeholders and I&AP's will be captured in the Issues and Response Report (IRR) which will form part of the final EIA Report. The Final EIAR including the IRR and EMPr, will be submitted to DEA for decision making. All I&AP's on the project database will be notified of the submission of the Final EIAR report.

Authority`s decision: All stakeholders and registered I&AP's will be notified about the Authority`s decision.

Description of the Alternatives to be Considered and Assessed

A Preferred Alternative 1 (red route) and an Alternative 2 route (blue route) have been proposed for the 400 kV transmission line between Blanco (Narina) and Droërivier, The two alternative alignments are proposed within a corridor of 2 km, as indicated in Figure 1 but the actual servitude required will be 55m wide.

Alternative 1:

Alternative 1 (Red) is estimated at about 178 km and is a relative straight line connection (shortest route) between Blanco and Droërivier. The line passes about 16.8km east of Oudtshoorn and crosses over the Groot Swartberg Nature Reserve approximately 14km north-west of De Rust (the nature reserve is stretching over the Swartberg for over 200 km). It loosely runs in a corridor west of the N12 towards the Droërivier substation.

Alternative 2:

Alternative 2 is estimated at 270 km. It uses the same proposed alignment as for the Red corridor till the intersection with the N9 and N12 roads. It loosely follows the N9 in an easterly direction, about 7.6 km east of the Kammanassie Nature Reserve, and west of Uniondale. It departs the N9 just east of the eastern point of the Swartberg Nature Reserve and heads north and north-west towards the Droërivier substation.

Site alternatives for the Droërivier Substation cannot be assessed since the substation already exist and infrastructure will only be upgraded to accommodate the additional line connection.

**The Narina Substation site has received Environmental Authorisation on 1 September 2016.*

Detailed mitigation measures were given in the specialist reports, and will be refined during the EIA phase. Comprehensive management statements will be made that will be employed to adequately address the impacts and risks that were identified for all phase of the proposed development.

At this stage Alternative 1 is preferred due to the shorter distance which would mean that it would result in a smaller footprint. The Scoping level assessment has however indicated that this route may impact negatively on sensitive vegetation and intensive farming activities. Loss of vegetation along the Alternative 2 route could result in a loss of farming land and income. The latter situation needs to be evaluated in specialist agricultural and ecological studies. During the Public Participation Process, resistance has been given to both alternatives, and it is suggested that the specialist studies focus on the areas where I&APs have identified problem areas.

Additional Specialist studies required during EIA phase

Western Cape has made recommendations for reports that are to form part of the EIR. Cape Nature stated that "Similarly detailed baseline assessments of watercourses, wetlands and associated features are required for consideration; as are assessments of the archaeological, palaeontological and heritage features within the study domain".

CapeNature would furthermore require a comparative assessment of the sensitivity of the areas proposed for the route alternatives; and specifically an assessment of the sensitivity of the mountainous crossings in the EIA phase, since the proposed Alternative 2 is shown to cross another mountain range which is presumed to be free of powerline servitudes and thus a baseline assessment of this area is required to adequately compare the impacts of both alternatives.

9. CONCLUSION

The negative impacts that are identified in this Final Scoping Report are **earmarked for further in depth studies during the EIA Phase**. Should any additional impacts be identified, these will be added to the Final Scoping Report. Regarding potential Heritage impacts, the NID was submitted to the Heritage Western Cape (HWC), who in their comments did not request paleontological studies for either line Alternatives. HWC has requested that Archaeology and Visual Impacts is investigated in the EIA for the Blanco-Droërivier line, but that a specialist paleontological report will not be required. The Eastern Cape DEDEAT has requested an ecological study in the EIA Phase to synthesise all the biological information so the ecosystem can be understood. The stakeholder Western Cape has commented on the Project and has made recommendations for reports that are to form part of the EIR. Cape *Nature stated that "Similarly detailed baseline assessments of watercourses, wetlands and associated features are required for consideration*; *as are assessments of the archaeological, paleontological and heritage features within the study domain".* CapeNature would furthermore require a comparative assessment of the sensitivity of the areas proposed for both route alternatives; and specifically an assessment of the sensitivity of the mountainous crossings in the EIA phase, since the proposed Alternative 2 is shown to cross another mountain range (the Kouga Mountain range), which is presumed to be free of powerline servitudes and thus a baseline assessment of this area is required to adequately compare the impacts of both alternatives

At this stage Alternative 1 is preferred due to the shorter distance which would mean that it would result in a smaller footprint**.** The Scoping level assessment has however indicated that this route may impact negatively on intensive farming activities and sensitive vegetation, in particular the Swartberg Area and fynbos. Loss of vegetation along the Alternative 2 route could however also result in a loss of farming land and income. The latter situation needs to be evaluated in specialist agricultural and ecological studies. During the Public Participation Process, resistance has been given to both alternatives.

The project is intended to strengthen the network. With a No GO option, this will not be possible and the occurrence and frequency of power interruptions will an increased risk. Not to construct a line in the area between Droërivier and Blanco will not be in line with the SIPS for the country. This is the main negative impact of a No Go Alternative.

This Draft Scoping Report has been prepared to allow public review and comments that will guide the EIA phase and allow decision making by the authorities regarding the need for information and specialist investigations that may be required during the EIA phase.