

CHAPTER 1: INTRODUCTION

1.1 BACKGROUND

Eskom is the South African utility that generates, transmits and distributes electricity. Eskom supplies about 95% of the country's electricity, and about 60% of the total electricity consumed in Africa. Eskom plays a major role in accelerating growth in the South African economy through the supply of high-quality electricity. Electricity is primarily generated in coal-fired power stations across the country. The electricity is transported from these stations along high voltage transmission power lines (usually 400kV, but also 220kV, 275kV, 533kV and 765kV lines) to Transmission substations or load centres. These substations then feed local distribution substations with power lines from 132kV and smaller voltage, from where electricity is distributed to communities and other users.

Eskom Group Capital Division is in the process of undertaking major infrastructure investments, including the construction of new substations and new transmission power lines. The transmission network supplying electricity to the Northern Cape and Free State Provinces requires strengthening to meet the growing demand in these provinces and to improve service quality and reliability. To address this situation Eskom has to construct a number of new transmission lines, linking its main generating facilities with the demand centres. The strengthening of the electricity network entails the phased construction of various 400kV transmission lines in the proposed Eskom Kimberley Strengthening Phase 4 Project.

The construction of a 400kV power line (among other project components) is a listed activity in terms of Section 24(5) of the National Environmental Management Act (NEMA), Act No 107 of 1998, as amended, and therefore requires environmental authorisation from the Department of Environmental Affairs (DEA). Eskom Transmission has therefore appointed Landscape Dynamics Environmental Consultants as an independent company, to conduct an Environmental Impact Assessment (EIA) to evaluate the potential environmental and social impacts of the proposed project and apply for Environmental Authorisation from the Department of Environmental Affairs.

1.2 PURPOSE AND CONTENT OF THE DOCUMENT

According to the NEMA 2010 regulations that apply to this application, a Scoping & Environmental Impact Assessment process is applicable.

The objectives of the Scoping Report were

- to identify the issues relevant to the activity for which authorisation is being applied for;
- to identify the potential impacts of the activity to enable authority to take into consideration the environmental effects of activities before development decisions are taken;
- to identify potential alternatives to the proposed activity to ensure the objectivity of the assessment process.
- to give all registered Interested & Affected Parties (I&AP's) the opportunity to comment on the preliminary findings and recommendation in terms of a viable route for the project.

The final Scoping Report submitted to the Department of Environmental Affairs (DEA) was approved on 15 April 2015. DEA advised that Landscape Dynamics could proceed with the tasks contemplated in the Plan of Study for the Environmental Impact Report as proposed in Chapter 8 of the Scoping Report.

The content of the Environmental Impact Report (EIR) is based on the above-mentioned approved Plan of Study and is summarised as follows:

- Confirmation of relevant legal requirement
- Project Description
 - a clear description of all the project components
 - relevant technical details;
 - a clear description of the final recommended route corridor with viable alternatives
- Final specialist investigations

Status quo reports were prepared by the specialists during the Scoping Phase. Environmental components that are more site-specific were only done in draft format. The purpose of these reports during the Scoping Phase was to identify obvious areas and/or “No Go” zones before the process has developed too far. Since the Draft Scoping Report was presented to all the I&AP’s, it was possible that the route corridors could be changed in which case the specialists had to revisit the site in order to prepare their final reports for the EIR.

The specialist reports already finalised during the Scoping Phase due to the macro area investigated (not being site-specific) include the following:

- Palaeontology Report
- Geotechnical Engineering Investigation
- Soil & Agricultural Potential Report

The following specialist reports were finalised for the Environmental Impact Report:

- Freshwater Study
- Terrestrial Fauna & Flora Study
- Bird Impact Report
- Heritage Impact Assessment
- Visual Impact Report
- Socio-economic, Tourism and Land Use Potential Impact

- Public Participation Programme

Proceedings, findings and recommendations of the Public Participation Programme (PPP) undertaken during the EIA Phase are summarised and includes the following:

- Distribution of the Draft EIR for comment;
- No comment that could change the outcome of the project as proposed during the Draft EIR phase was received and a second Public Open Day and/or Stakeholder Meeting(s) were not conducted;
- Continuous and direct liaison with the directly affected landowners took place to strive to ultimately present route corridors (preferred and viable alternative) on which reasonable consensus have been reached.
- Distribution of the Final EIR is not required because no significant changes to the Draft EIR were made.
- All comment, objections and concerns raised and submitted by the I&AP’s were addressed during the PPP and all proceedings, recommendations and correspondence is documented in the Final EIR (this document) which is submitted to DEA for their perusal and ultimately the issuing of the Environmental Authorisation.

- Impact Assessment

An impact assessment based on relevant issues and impact identified during both the Scoping and the EIR Phases is supplied in Chapter 6 of this EIR. Impact were evaluated and assessed in terms of extent; duration, probability; magnitude/intensity and significance.

- Environmental Management Plan

An Environmental Management Plan (EMP) was compiled and is included as Appendix F of the EIR. The main objectives of the EMP are to confirm actions and mitigation measures to minimise expected negative impact and enhance positive impact during all development phases (design/pre-construction, construction, and post-construction/operation) in terms of community issues, construction site preparation, construction workers, habitat protection, security, etc. Communication channels and contact details are also be provided.

DEA will review the EIR and EMP and one of the following decisions may apply:

- Grant authorisation of the activity
- Refer the report for specialist review
- Request further information or specialist investigations
- Refuse the activity

Landscape Dynamics endeavours with this report to submit a comprehensive study containing all relevant data and information in order to enable informed, fair and responsible decision-making by DEA.

1.3 LEGAL REQUIREMENT

1.3.1 NATIONAL ENVIRONMENTAL MANAGEMENT ACT (ACT 107 OF 1998)

This application is done in terms of the National Environmental Management Act, 1998 (Act No 107 of 1998) (NEMA) and the Environmental Impact Assessment Regulations published in Government Notice No. R.543, June 2010. Environmental Authorisation is requested for the following listed activities:

Government Notice 544 (Listing Notice 1)	
<p>Listing Notice 1: Number 11 The construction of: (i) canals; (ii) channels; (iii) bridges; (iv) dams; (v) weirs; (vi) bulk storm water outlet structures; (vii) marinas; (viii) jetties exceeding 50m² in size; (ix) slipways exceeding 50m² in size; (x) buildings exceeding 50m² in size; or (xi) infrastructure or structures covering 50m² or more where such construction occurs within a watercourse or within 32m of a watercourse, measured from the edge of a watercourse, excluding where such construction will occur behind the development setback line.</p>	<p>The proposed activities involve the construction of power lines of which the foundations plus associated structures would exceed 50m² – referring to concrete foundations for both the pylons plus cables. As well as a temporary access roads.</p> <p>The proposed pylon structure at this stage is either the Guyed V- Type with a total base width of 26 meters with pointed tower base in the centre; or the Cross-Rope Suspension Type with a distance between base towers of 21 meters.</p> <p>The aquatic features within the study area that would be affected consist of endorheic pans and associated wetland areas and drainage lines.</p>

	<p>The extent to which the watercourses would be affected could however only be determined once the final route design with placement of pylons had been done. A site walkover with the freshwater specialist at that stage will also further confirm the extent to which impact would occur.</p>
<p>Listing Notice 1: Number 18 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 from (i) a watercourse; (ii) the sea; (iii) the seashore; (iv) the littoral active zone, an estuary or a distance of 100 metres inland of the highwater mark of the sea or an estuary, whichever distance is the greater; but excluding where such infilling, depositing, dredging, excavation, removal or moving (i) is for maintenance purposes undertaken in accordance with a management plan agreed to by the relevant environmental authority; or (ii) occurs behind the development setback line</p>	<p>It is proposed that the new substation should be placed in such a manner as to avoid impacting on pans and associated wetland areas - to be confirmed only during the design phase.</p> <p>The concrete foundations will exceed 5 cubic metres per pylon structure with cables and could affect the aquatic features occurring within the study area that consist of endorheic pans and associated wetland areas and drainage lines.</p> <p>The extent to which the watercourses would be affected could however only be determined once the final route design with placement of pylons had been done. A site walkover with the freshwater specialist at that stage will also further confirm the extent to which impact would occur.</p>

Government Notice 545 (Listing Notice 2)

<p>Listing Notice 2: Number 8 The construction of facilities of infrastructure for the transmission and distribution of electricity with a capacity of 275 kilovolts or more, outside an urban area or industrial complex.</p>	<p>The proposed 400kV power line will run mostly outside urban areas and/or industrial complexes on agricultural and game farm land.</p>
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Government Notice 546 (Listing Notice 3)

<p>GN 546, June 2010, Number 14 The clearance of an area of 5 hectares or more of vegetation where 75% or more of the vegetative cover constitutes indigenous vegetation, except where such removal of vegetation is required for: Northern Cape provinces</p> <ol style="list-style-type: none"> (1) purposes of agriculture or afforestation inside areas identified in spatial instruments adopted by the competent authority for agriculture or afforestation purposes; (2) the undertaking of a process or activity included in the list of waste management activities published in terms of section 19 of the National Environmental Management Waste Act, 2008 (Act No. 59 of 2008) in which case the activity is regarded to be excluded from this list. (3) the undertaking of a linear activity falling below the thresholds in Notice 544 of 2010. <p>i) All areas outside urban areas</p>	<p>The study area affects rural land of which some falls on game farms with an indigenous vegetation cover of 75% or more.</p> <p>The extent of the substation site had been confirmed as 5ha each. Eskom requires a servitude width of 55m (27,5m on either side of the line) which will have to be cleared of potential obstructions to the powerline and for construction, inspection and maintenance purposes.</p> <p>The total area to be cleared would exceed 5 hectares.¹</p>
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In terms of the NEMA legislation application for environmental authorisation is lodged with the National Department of Environmental Affairs (DEA). DEA has to evaluate this Scoping Study and based on the findings and proceedings documented in the Scoping Report supply the Environmental Assessment Practitioner (EAP) with a decision to proceed with the EIA or to amend the Scoping Report.

The following departments and government institutions are key commenting authorities:

- Department of Economic Development, Tourism and Environmental Affairs, Northern Cape Provinces (Section Environmental Quality Management).
- Department of Water and Sanitation (DWS), Northern Cape Region
- The South African Heritage Resources Agency (SAHRA). They will advise whether authorisation is also required from the Free State and or Northern Cape Provincial Heritage Authority.

The NEMA can be regarded as the most important piece of general environmental legislation. It provides a framework for environmental law reform and covers three areas, namely:

- Land, planning and development;
- Natural and cultural resources, use and conservation; and
- Pollution control and waste management.

The law is based on the concept of sustainable development. The objective of the NEMA is to provide for co-operative environmental governance through a series of principles relating to:

- The procedures for state decision-making on the environment; and
- The institutions of state which make those decisions.

The NEMA principles serve as:

- A general framework for environmental planning;
- Guidelines according to which the state must exercise its environmental functions; and
- A guide to the interpretation of NEMA itself and of any other law relating to the environment.

NEMA principles are the following:

- Environmental management must put people and their needs first;
- Development must be socially, environmentally and economically sustainable;
- There should be equal access to environmental resources, benefits and services to meet basic human needs;
- Government should promote public participation when making decisions about the environment;
- Communities must be given environmental education;
- Workers have the right to refuse to do work that is harmful to their health or to the environment;
- Decisions must be taken in an open and transparent manner and there must be access to information;
- The role of youth and women in environmental management must be recognised;
- The person or company who pollutes the environment must pay to clean it up;
- The environment is held in trust by the state for the benefit of all South Africans; and
- The utmost caution should be used when permission for new developments is granted.

1.3.2 THE NATIONAL WATER ACT (ACT NO 36 OF 1998)

The National Water Act guides the management of water in South Africa as a common resource. The Act aims to regulate the use of water and activities which may impact on water resources through the categorisation of 'listed water uses' encompassing water extraction, flow attenuation within catchments as well as the potential contamination of water resources. The Department of Water & Sanitation (DWS) is the administering body in this regard.

Should the proposed activities associated with the substation or power line impact on water resources e.g. cross through rivers, the applicant would be responsible to obtain a Water Use License or General Authorisation for the activity from the regional office of DWS.

1.3.3 THE NATIONAL HERITAGE RESOURCES ACT (ACT 25 OF 1999)

The proposed project falls within the scope of Section 38 of the National Heritage Resources Act, (Act 25 of 1999) and the applicable activities are:

- (a) the construction of a road, wall, power line, pipeline, canal or similar form of linear development or barrier exceeding 300m in length;
- (b) any development or other activity which will change the character of a site-
 - exceeding 5 000m² in extent
- (c) the re-zoning of a site exceeding 10 000m² in extent

1.3.4 ADDITIONAL ACTS, FRAMEWORKS AND GUIDELINES

National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004)

The purpose of the Biodiversity Act is to provide for the management and conservation of South Africa's biodiversity within the framework of the NEMA and the protection of species and ecosystems that warrant national protection. As part of its implementation strategy, the National Spatial Biodiversity Assessment was developed. Should protected species and ecosystems be impacted on by the proposed substation or power line, this Act may be applicable and the necessary measures should be taken for implementation.

Note should be taken of the **Alien and Invasive Species Regulations, 1 August 2014 (GNR 598)** which requires that all alien and/or invader plants declared as invaders/weeds, in accordance with the regulations, must be removed.

National Environmental Management: Protected Areas Act (No 57 of 2003)

The Act came into operation on 1 November 2004. The aim of the Act is to provide for the protection and conservation of ecologically viable areas representative of South Africa's biological diversity, natural landscapes and seascapes. In 2004, the National Environmental Management: Protected Areas Amendment Act 31 of 2004 was promulgated to amend Act 57 of 2003 with regard to the application of that Act to national parks and marine protected areas. The NEM: Protected Areas Amendment Act was published for public information on 11 February 2005 and came into operation on 01 November 2005. The NEM: Protected Areas Act, as amended by the NEM: Protected Areas Act 31 of 2004 repeals sections 16, 17 & 18 of the ECA as well as the National Parks Act with the exception of section 2(1) and Schedule 1.

National Environmental Management: Air Quality Act, 2004 (No 39 of 2004)

Section 32 Control of dust; Section 34 Control of Noise; Section 35 Control of offensive odours.

The Constitution Act (No 108 of 1996)

Chapter 2 Bill of Rights; Section 24 Environmental rights; Section 25 Rights in property; Section 32 Administrative justice; Section 33 Access to information.

Expropriation Act (No. 63 of 1975)

Eskom has a policy of "willing buyer, willing seller", and therefore endeavours to purchase land where ever possible or necessary. However, the State and State-owned-enterprises can acquire the rights to use or possess the requisite land through the Expropriation Act (No 63 of 1975). The Expropriation Act requires the determination of compensation based on the principle of market value (i.e. what would the value be in the event of both a willing buyer and a willing seller trading the land). There is a suite of additional legislation, which, in conjunction with the Expropriation Act, could be used to determine the compensation value.

Occupational Health and Safety Act (Act No 85 of 1993)

This Act makes provisions that address the health and safety of persons working at the proposed substation and power line. The Act addresses amongst others the:

- Safety requirements for the operation of plant machinery;
- Protection of persons other than persons at work against hazards to health and safety, arising out of or in connection with the activities of persons at work;
- Establishment of an advisory council for occupational health and safety; and
- Provision for matters connected therewith.

The law states that any person undertaking upgrades or developments for use at work or on any premises shall ensure as far as is reasonably practicable that nothing about the manner in which it is erected or installed make it unsafe or creates a risk to health when properly used.

The Tourism Act, 1993 (Act No. 72 of 1993)

Policy and legislation governing tourism in South Africa emphasises the concepts of responsible tourism and sustainable tourism development. Tourism is legislated in terms of the Tourism Act (Act No. 72 of 1993), which was amended as the Tourism Amendment Act (Act No. 105 of 1996 and the Tourism Second Amendment Act no. 70 of 2000). The 1996 White Paper on Development and Promotion of Tourism in South Africa introduces the concept of “responsible tourism”; i.e. tourism with a responsibility towards the environment, through sustainable use of resources, involvement of local communities, and commitment to safety and security of all concerned. Taking this further, the drive towards “sustainable tourism” development emphasises the optimisation of benefits relating to tourism,

The Conservation of Agricultural Resources Act (No 43 of 1983)

Section 6: Implementation of control measures for alien and invasive plant species.

Atmospheric Pollution Prevention Act (No 45 of 1964) and regulations

Sections 27 – 35: Dust control.

Section 36 – 40: Air pollution by fumes emitted by vehicles.

Occupational Health and Safety Act (No 85 of 1993) and regulations

Section 8: General duties of employers to their employees.

Section 9: General duties of employers and self-employed persons to persons other than their employees.

National Forests Act (No 84 of 1998) and Regulations

Section 7: No person may cut, disturb, damage or destroy any indigenous, living tree in a natural forest, except in terms of a licence issued under section 7(4) or section 23; or an exemption from the provisions of this subsection published by the Minister in the Gazette.

Sections 12-16: These sections deal with protected trees, with the Minister having the power to declare a particular tree, a particular group of trees, a particular woodland; or trees belonging to a particular species, to be a protected tree, group of trees, woodland or species. In terms of section 15, no person may cut, disturb, damage, destroy or remove any protected tree; or collect, remove, transport, export, purchase, sell, donate or in any other manner acquire or dispose of any protected tree, except under a licence granted by the Minister.

Fencing Act (No 31 of 1963)

Section 17: Any person erecting a boundary fence may clean any bush along the line of the fence up to 1.5m on each side thereof and remove any tree standing in the immediate line of the fence. However, this provision must be read in conjunction with the environmental legal provisions relevant to protection of flora.

Fertilisers, Farm Feeds, Agricultural Remedies and Stock Remedies Act (No 36 of 1947) and regulations

Sections 3 to 10: Control of the use of registered pesticides, herbicides (weed killers) and fertilisers. Special precautions must be taken to prevent workers from being exposed to chemical substances in this regard.

White Paper on the Energy Policy of the Republic of South Africa – 1998

Development within the energy sector in South Africa is guided by the White Paper on the Energy Policy, published by the Department of Minerals and Energy (DME) in 1998. This White Paper sets out five objectives for the further development of the energy sector. The five objectives are as follows:

- Increased access to affordable energy services;
- Improved energy governance;
- Stimulating economic development;
- -Managing energy-related environmental and health impacts; and
- Securing supply through diversity.

Furthermore, the Energy Policy identified the need to undertake an Integrated Energy Planning (IEP) process in order to achieve a balance between energy demand and resource availability, whilst taking into account health, safety and environmental aspects. In addition, the policy identified the need for the adoption of a National Integrated Resource Planning (NIRP) approach to provide a long-term cost-effective resource plan for meeting electricity demand, which is consistent with reliable electricity supply and environmental, social and economic policies.

Department of Environmental Affairs Integrated Environmental Management Series

DEA's Information Series were drafted as sources of information about concepts and approaches to Integrated Environmental Management (IEM). IEM is a key instrument of NEMA and provides the overarching framework for the integration of environmental assessment and management principles into environmental decision-making. The aim of the information series is to provide general guidance on techniques, tools and processes for environmental assessment and management.

National Spatial Biodiversity Assessment

The National Spatial Biodiversity Assessment (NSBA) classifies areas as worthy of protection based on their biophysical characteristics, which are ranked according to priority levels.

Protected species – Provincial Ordinances

Provincial ordinances were developed to protect particular plant species within specific provinces. The protection of these species is enforced through permitting requirements associated with provincial lists of protected species. Permits are administered by the provincial departments responsible for environmental affairs.

All relevant Provincial Legislation and Municipal bylaws

National Department of Environmental Affairs: Guidelines

The National Department of Environmental Affairs has a set of guidelines that have to be adhered to during the EIA Process. The following guidelines are applicable:

- Companion Guideline for the Implementation of the Environmental Impact Assessment Regulations (Guideline 5), as published in Government Notice 805 of 10 October 2012.
- Public Participation Guideline for the Environmental Impact Assessment Process (Guideline 7), as published in Government Notice 807 of 10 October 2012.

Eskom Environmental Procedures

Eskom Environmental Procedures in terms of:

- Acquiring of servitudes
- Bush Clearing
- Access to properties

1.3.5 ESKOM PLANNING PROCESSES

The following section, although not legislative, provide supplementary information on some of Eskom's planning processes.

Integrated Resource Plan for Electricity (IRP) – 2010

The Integrated Resource Plan (IRP) is a long-term electricity capacity plan, which defines the need for new generation and transmission capacity for the country. The IRP outlines the concepts and development behind the IRP for the electricity industry in South Africa as well as the strategic objectives of the IRP including the policy and technical parameters that drive the planning process.

The **National Energy Act of 2008 (Act 34 of 2008)** obligates the Minister of Energy to develop and publish an IRP for energy. As electricity forms a sub-component of the energy sector the electricity IRP needs to be integrated into the outlook for energy. The system Operations and Planning Division in Eskom has been mandated by the Department of Energy (DoE), under the New Generation Capacity regulations, to produce the IRP for electricity in consultation with the DoE and the National Energy Regulator of South Africa (NERSA). The objective of the IRP is to develop a sustainable electricity investment strategy for generation capacity and transmission infrastructure for South Africa over the next 25 years. The investment strategy includes implications arising from demand-side management (DSM) and pricing, and including capacity provided by generators (Eskom and independent power producers).

The IRP is intended to:

- Improve the long term reliability of electricity supply through meeting adequacy criteria over and above keeping pace with economic growth and development;
- Ascertain South Africa's capacity investment needs for the medium term business planning environment;
- Consider environmental and other externality impacts and the effect on renewable energy technologies;
- Provide the framework for Ministerial determination of new generation capacity (inclusive of the required feasibility studies) as envisaged in the New Generation Capacity regulations.

1.4 PROJECT TEAM

1.4.1 DETAILS OF THE ENVIRONMENTAL ASSESSMENT PRACTITIONER

Landscape Dynamics Environmental Consultants has been appointed to apply for Environmental Authorisation on behalf of Eskom SOC Limited (Group Capital Division) for this project. Landscape Dynamics cc is an environmental consultancy firm, established in May 1997. The main line of business since that time up to the present date is the compilation of environmental impact assessments. Landscape Dynamics has a broad client base from both the private and government sectors which has developed over the past 17 years of professional services supplied. The operating base for Landscape Dynamics is the entire South Africa; with local representation in Gauteng, the Western Cape, Limpopo, Mpumalanga and Kwazulu-Natal.

The Environmental Assessment Practitioners (EAP's) for this project are Ms Annelize Grobler and Ms Susanna Nel.

The Landscape Dynamics' Company Profile as well as relevant condensed Curriculum Vitae's are attached in Appendix H.

1.4.2 PROFESSIONAL TEAM

The impact that this project might have on the environment could only effectively be assessed if all the environmental project components had satisfactorily been identified and considered. A multi-disciplinary approach was therefore required for this Environmental Impact Assessment.

The EIA Project Team members are the following (condensed CV's are attached in Appendix H):

Company Name	Contact Person(s)	Responsibility and/or Project Component
Landscape Dynamics CC	Ms Annelize Grobler Ms Susanna Nel	EIA Project Management Environmental Assessment Practitioners Public Participation Programme
AMP Property Management & Land Acquisition	Ms Anna-Marie Botha Ms Maritha Duvenage	Route verification Liaison with landowners Socio-Economic, Tourism and Land Use Potential Impact
Evolutionary Studies Institute, University of the Witwatersrand	Prof Marion Bamford	Palaeontology Impact Assessment
Geoset Geotechnical Engineers	Mr David van der Merwe	Geotechnical Engineering Investigation
Terra Africa Consult CC	Ms Marine Pienaar	Soils & Agricultural Potential Report
Blue Science (Pty) Ltd	Dr Toni Belcher & Mr Dana Grobler	Freshwater Impact Assessment Water Use License Applications
Enviroguard Ecological Services CC	Dr Leslie Brown	Terrestrial Fauna & Flora
Chris van Rooyen Consulting	Mr Chris van Rooyen	Bird Impact
Archaetnos Cultural & Heritage Resource Consultants	Dr Anton van Vollenhoven	Heritage Impact Assessment
Newtown Landscape Architects	Mr Graham Young	Visual Impact Assessment
Ivan Pauw & Partners Attorneys	Mr Travis Baikie	Legal Review

The EIA Project Team is supported by the following team members from within Eskom Group Capital Division:

Division within Eskom Group Capital Division	Contact Person(s)	Responsibility and/or Project Component
Eskom Project Development Engineer	Mr Fick Booyesen	Overall Project Management
Eskom Land Development: Manager	Mr Itumeleng Moeng	Project Management
Eskom Land Development: Environment	Ms Lindiwe Motaung	Applicant Representative & Environmental Manager
Eskom Land Development: Acquisition	Mr Koos van der Merwe	Compensation and Servitude Acquisition
Eskom Land Development: Survey	Ms Tinny Makaringe	Mapping
Eskom Land Development: Spatial	Mr Christo Bandehorst	Route Planning
Eskom Land Development: Project Planning	Ms Jamila Kombe	Project Planning
Eskom Land Development: Line Engineering Services	Mr Mdu Mthethwa	Line Designer
Eskom Land Development: Acquisition	Mr Koos van der Merwe	Acquisition

CHAPTER 2: PROJECT INFORMATION

2.1 NEED AND DESIRABILITY

In the past 15 years load has increased in the Hotazel-Kuruman-Kathu-Kimberley-Dealesville corridor by 32.5%. The forecast in this corridor anticipates a huge load growth as a result of high mining activities (diamond, manganese and iron ore mining), electrification and the establishment of small businesses in underdeveloped areas as well as increased housing densities and commercial development in developed areas. Growth is anticipated to quadruple in the next 25-30 years.

The existing network will not be able to support the Hotazel-Kuruman-Kathu-Kimberley-Dealesville corridor load past 2021, therefore strengthening will be required to support the forecasted load and potential renewable generation. In addition, changes in the generation pattern have resulted in Beta Transmission Substation, which is in the Free State Province and the starting point of the Kimberley Strengthening Phase 4 Project, becoming a stronger injection source to this corridor.

The role of grid planning flows from the Eskom Transmission License issued by NERSA of which the main scope of activities is to plan and augment the transmission system in accordance with the South African Grid Code. The Transmission Grid Code (GCD) stipulates that the transmission network shall be N-1 compliant. This implies that the transmission network must be able to supply the load under loss of any of the power lines or equipment. The existing network is currently not compliant and the problem will worsen as the load in the region increases. The solution proposed is to construct a 400kV ring feed supply.

2.2 PROJECT DESCRIPTION

2.2.1 LOCALITY & REGIONAL CONTEXT

The total Eskom Strengthening Phase 4 Project entails the construction of an approximate 390km 400kV power line. The line starts west of the town of Dealesville in the Free State and ends south of Kathu in the Northern Cape. The approximately 390km power line runs east to west, starting at the **Beta** Substation, connects to the **Boundary** Substation, then on to the **Ulco** Substation, connects at the **Olien** Substation, then **Manganore** Substation and ends at the **Ferrum** Substation. The Beta and Boundary Substations are situated in the Free State Province and the Ulco, Olien, Manganore and Ferrum Substations are all situated in the Northern Cape Province.

Due to the significant length and extensive study area across two provinces, the application for Environmental Authorisation for this project was divided into four different applications. These applications are as follows:

- Application 1 (DEA Reference No 14/12/16/3/3/2/647)
Eskom Kimberley Strengthening Phase 4 Project: **Beta to Boundary** (Free State Province)
- Application 2 (DEA Reference No 14/12/16/3/3/2/646)
Eskom Kimberley Strengthening Phase 4 Project: **Boundary to Ulco** (Free State and Northern Cape)
- Application 3 (DEA Reference No 14/1/16/3/3/2/645)
Eskom Kimberley Strengthening Phase 4 Project: **Ulco to Olien to Manganore** (Northern Cape Province)
- Application 4 (DEA Reference No 14/12/16/3/3/2/644)
Eskom Kimberley Strengthening Phase 4 Project: **Manganore to Ferrum** (Northern Cape Province)

Note that this Environmental Impact Report has ONLY been prepared for Application 3 – the ULCO-OLIEN-MANGANORE section of the project.

The line runs in a westerly direction through the areas of the Dikgatlong, Kgatelopele and Tsantsabane Local Municipalities in the Northern Cape Province. The closest towns are Barkley West, Ulco, Danielskuil, Owendale, Koopmansfontein, Lime Acres, Owendale and Postmasburg (refer to the Route & Locality Map attached in Appendix A).

Different route alternatives were considered during the course of the project. The properties that had initially been investigated by the proposed ULCO-OLIEN-MANGANORE application included the following but were not necessarily limited to, various portions of the farms Plaas 217, Plaas 215, Plaas 234, Nooitgedacht 392, Weltevreden 214, Alexandersfontein 213, Koopmansfontein 212, Plaas 375, Plaas 232, Plaas 233, Plaas 277, Plaas 293, Oudekraal 294, Oudekraal 294, Voorspoed 5, Glen Ross 395, Bergmanshoop 4, Plaas 274, Plaas 3, Plaas 3, Portion 2, Plaas 273, Portion 1, Plaas 273, Good Hope 272, Plaas 2, Plaas 11, Cavonne 271, Plaas 270, Plaas 1, Glen Allen 12, Plaas 269, Plaas 13, Plaas 510, Plaas 509, Plaas 295, Plaas 508, Grootvlei 296, Vlakpan Zuid 268, Plaas 297, Plaas 297, Plaas 267, Hartbeesput 266, Rooipan 507, Plaas 298, Plaas 299, Carter Block 458, Engeland 300, Plaas 213, Plaas 377, Plaas 210, Plaas 239, Plaas 240, Plaas 240 and Plaas 269.

The properties that are now affected by the Route One Corridor (Preferred) for the ULCO-OLIEN-MANGANORE application - refer to Appendix A(5) - are the following:

Ulco Substation to Olien Substation

Plaas 217, Plaas 215, Plaas 215 Restant, Plaas 234 Restant, Weltevreden 214 Portion 1 (Nooitgedacht 392), Weltevreden 214 Restant, Alexandersfontein 213, Plaas 213 Portion 2, Koopmansfontein 212 Portion 1, Plaas 377 Remainder, Plaas 210, Plaas 239, Plaas 240 Remainder, Plaas 241, Plaas 375, Plaas 269 Remainder, Vlakpan Zuid 268 Portion 1, Plaas 297 Portion 1, Plaas 267 Remainder, Plaas 298 Portion 3, Plaas 299 Portion 2, Plaas 299 Portion 3, Carter Block 458 Portion 16, Engeland 300 Portion 3 and Engeland 300 Portion 4.

Olien Substation to Manganore Substation

Engeland 300 Portion 4, Plaas 300 Portion 1, Carter Block 458 Portion 16, Carter Block 458 Portion 36, Carter Block 458 Portion 6, Carter Block 458 Portion 7, Carter Block 458 Portion 14, Carter Block 458 Portion 8, Carter Block 458 Portion 17, Carter Block 458 Portion 15, Carter Block 458 Portion 24, Carter Block 458 Portion 5, Carter Block 458 Portion 65, Plaas 457 Remainder, Plaas 457 Portion 5, Plaas 457 Portion 3, Lemoenkloof 456 Portion 1, Plaas 455 Portion 1, Plaas 455 Restant, Plaas 589 Portion 3, Plaas 589 Portion 4, Plaas 589 Portion 5, Plaas 589 Portion 6, Plaas 589 Portion 7, Plaas 589 Portion 15, Plaas 588, Plaas 438 Portion 1, Plaas 437 Remainder, Kapstewel 436 Restant, Kapstewel 436 Portion 4

2.2.2 PROJECT COMPONENTS AND TECHNICAL INFORMATION

The project will consist of the construction of an approximately 57km 400kV power line from the Ulco Substation to the Olien Substation and approximately 58km 400kV power line from the Olien substation to the Manganore Substation (approximate 133km in total of power line to be constructed). A new Olien TX (Transmission) Substation adjacent to the existing Olien DX (Distribution) Substation will also be constructed.

A maximum area of 5 hectares is generally investigated and/or acquired for a transmission substation, although the actual footprint of the substation will be less than 5 hectares. The additional land is however necessary to allow for sufficient space for entries and exits of power lines from all directions.

Different pylon structures are being considered for this project. Find attached diagrams with their dimensions attached in Appendix B. They include the following, with the Guyed and Cross-Rope Suspension Type towers being the preferred option from Eskom's point of view at this stage:

- Guyed Suspension Type - Top width 23m; total base width 26m with pointed tower base in the centre, height average 33m
- Cross-Rope Suspension Type – Top width 29m; distance between base towers 21, height up to 38m.
- Strain Tower Type – Top width 22,8m; base width 22,8; total base 55 meters; height average 33m
- Double Circuit (where more than one power line is carried via the same pylons) – Top width 12,6m; base width 8,05m; height average ranging between 30m and 61,22m
The proposed “double circuit” line is a worst case scenario. It will only be used where no other viable alternative is possible due to huge financial implications and construction constraints.

The final pylon structure will however only be determined during the design phase. The choice of pylon structure will be guided by the site-specific characteristics, i.e. geology, soils, topography, landowners' preference, etc. At this stage it does however appear as if the 'Cross-Rope Suspension Type' pylon is favoured by the engineers for this project specifically.

2.2.3 SERVITUDE DETAILS

The servitude width is 55m, with 27.5m on either side of the line. Note however that for the purpose of the Environmental Impact Assessment a route corridor width of 2km is being investigated for each alternative and a 2km wide route corridor will ultimately be authorised by DEA. This enables slight adjustments within the corridor during the corridor walk-down and servitude negotiations with the relevant landowners without having to enter into an additional environmental authorisation process.

It will be strived to reach reasonable consensus during the EIA process with the directly affected landowners with regards to the route and the 2km wide corridor across their properties. As soon as environmental authorisation has been obtained, Eskom will appoint independent evaluators and the process of negotiation in terms of compensation with the relevant landowners will take place. It is also during this process that site-specific issues will be addressed that include the following:

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

After all agreements had been finalised; the servitudes will be registered against the properties at the deeds office. The property remains that of the landowner, but Eskom will have the right to build and maintain a power line according to the servitude conditions referred to above.

2.2.4 METHOD STATEMENT

The construction of a transmission line involves the following actions:

Surveying (Pegging of tower positions)

- Resources: Surveyor, assistants, survey instruments, 4x4 vehicle, hammers, steel tapes and steel pins.
- The tower positions are pegged using a single steel pin knocked into the ground. The position is reached by utilising GPS co-ordinates taken from the tower staking table. Cross sections of the site will be taken to facilitate the calculation of the tower leg extensions.

- Whilst driving in the field, special care is taken not to drive through visible wet areas and drive through streams. Existing tracks are preferred and will be utilised as far as possible.
- In the event that access is not available or impossible, walking will be an option.
- The surveyor will note all available access routes and problem areas. Access routes will be investigated and agreed upon in writing by the Environmental Control Officer (ECO), where after they will be marked.

Geotechnical Soil Investigations

- Resources: Geotechnical engineer, assistant, operator, ladder, geological pick, 4x4 vehicle and excavator.
- Access routes are followed as agreed upon and marked to reach the tower positions. No multiple tracks will be allowed.
- The excavator will dig a trail pit to the approximate depth of 3m deep x 2m square.
- The topsoil will be removed and placed apart from the rest.
- Geotechnical engineer will climb down the hole by means of the ladder and classify the soil type and propose the tower foundation type to be installed.
- The hole will be backfilled with the excavated soil and then covered with the topsoil.
- In the event of probable oil spillage from the excavator (all vehicles and machinery will be equipped with drip-trays), spillage will be removed using a spill kit as required by environmental specification and disposed of at a registered dumping site.

Setting out of towers

- Resources: Surveyor, assistants, survey equipment, steel measuring tapes, hammers and 4x4 vehicle.
- Once the foundations have been designed and the drawings approved, the surveyor will peg the foundation as per the approved drawings, driving to the tower position via the approved access routes.
- Notes and photographs are to be taken of the position for record purposes both before and after construction.

Foundation Excavations

A site plan or a tower foundation excavation layout plan shall be drawn up as a basis for discussion between the Contractor and the Employer (Site Representative and Environmental Control Officer) resulting in a formal signed document of how the foundation will be excavated at a given site. There are three basic part of this layout plan:

Tower site information

The tower site information includes all the limitations and restrictions as per the Environmental Authorisation for access, operation and demobilisation of the equipment required to install the spread foundation (conventional foundation) such as:

- Restrictions on points of access to the tower position
- Equipment limitations on site
- Underground and overhead services
- Existing structures
- Clearing restrictions
- Presence of surface water
- Environmental restrictions

Foundation Construction Survey

The construction survey establishes the foundation centre hub, reference points, elevations and required depth of the excavations. Before the excavation of the foundation can start, the outline of the tower foundation is set out as per the approved foundation drawing and the depth of the excavation calculated. The centre of the leg excavation is established and the depth calculated in relation to the foundation hub. The foundation hub is used to control the depth of the excavation. (The four corners of the foundation excavation should match the dimensions of the concrete foundation slab if the concrete is cast against in-situ material).

Foundation Site Information

Foundation site information in compliance of the Environmental Authorisation includes the following:

- Access to the tower position;
- Foundation assembly site;
- Spoil pile management;
- Erosion control measurements.

Access to the foundation sites and the sequence of excavating each foundation must be planned to avoid the undercutting of other foundations. Access limitations may require that only one leg foundation may be done at a time; excavated, assembled, set and backfilled. Large spread foundations are often required, which require a spoil pile management plan. The excavated material is normally used for backfilling. The topsoil and fines need to be separated so that they can be replaced as topsoil and used adjacent to the foundation. All surplus material will be removed from site. Erosion control measures to be done in consultation with the ECO.

Excavation

The equipment and methods that are used for the excavation of the foundation depends on the type of soil that is encountered at the excavation site. The following types of soil can be encountered on site (TRMSCAAC1 rev 3):

- “Type 1”: competent soil with equal or better consistency than would be encountered in stiff cohesive soil;
- “Type 2”: less competent soil than “type 1” with weaker or equal consistency in firm to stiff cohesive soils;
- “Type 3”: dry loose non cohesive soil or very soft to soft cohesive soils;
- “Type 4”: submerged cohesion less and cohesive soils. This includes soils below the permanent water table, including soils below a re-occurring perched water table or permeable soils in low lying areas subjected to confirmed seasonal flooding.

Often a high water table will require dewatering of the excavation. Depending on the specific site conditions, open pumping, cut-off drains (trenches), or drainage pits may be necessary to remove the water. Should the water continue to run into or seep from the walls or the bottom of the excavation a sump hole may be dug at one of the corners of the foundation bottom and a small pump used in these pumping holes to keep the foundation dry during the construction of the foundation. Whenever personnel are in the excavations, the safety hazards shall be assessed. There must be good means of ingress and egress from the excavation. Excavated material shall be stock piled away from the edges of the excavation and round rocks and boulders will be preferably placed in a location and manner that will prevent them from rolling back into the excavation. The stability of the side walls shall be inspected to establish the soundness thereof in mitigating against the collapsing of the sides.

Foundation Preparation

After the excavation the stability of the foundation bottom shall be checked to ensure that the bearing capacity is adequate. In the case of foundations in soil type “3” and “4”, a blinding layer of not less than 50mm shall be cast as to have a firm and clean surface to work on. The excavation shall be kept free of water and mud.

Foundation Installation

All the reinforcing shall be placed using the specified bar sizes and spacing top and bottom before the stubs are placed in the centre of the foundation and the rake of the stub set at the required angles.

Foundation Setting

Once the reinforcing and the stubs have been placed the final setting are done. Measurement and levels are set to within the allowable tolerances and checked. Cover blocks are placed and checked that the specified cover is obtained from the bottom and sides of the excavation before first layer of concrete is cast. Successive layers are checked and cast after the cover to the shuttering is checked and released for concrete casting.

Concrete Placing

During the casting of concrete into the foundation slabs, plinths and columns care shall be taken to prevent any spillage of concrete from the concrete mixer trucks. Any spillage shall be cleaned and wasted concrete placed in special containers for this purpose and then disposed of at registered dumping sites. No washing or rinsing of the mixer drums will be undertaken on site. Rinsing will be disposed of in special constructed areas to contain the cement water in consultation with, and approval of the ECO.

Backfilling

Backfilling will be done in layers of 300mm utilising suitable excavated material. Should the excavated material not be suitable, imported material shall be used from approved borrow pits. The final layers shall be done with the topsoil separated from the rest of the excavated material.

Site Restoration

After the backfilling has been completed the excess soil shall be removed from site and dumped at an approved site as agreed with the ECO. The area around the excavation site shall be cleared of all debris and rubbish. The oversight of possible oil, cement and concrete spillage shall be cleared in the specified manner and properly disposed of. All site vehicles and equipment shall be equipped with the necessary oil drip trays.

Tower Assembly and Erection

Access to the Tower sites and the sequence of assembly and erection of each tower will be planned to avoid unsafe working conditions. All site vehicles and equipment shall be equipped with oil drip trays.

Stringing of Phase and Earth Conductors

Puller and Tensioner Site Information

Tower site information in compliance with the Environmental Authorisation will include the following:

- Access to the proposed Puller, tensioner and drum station positions as per the agreement and approval of the ECO.
- Access to tower positions to offload and dress towers with Insulators and Hardware.
- Access to Tower positions along the servitude to install the pilot ropes/ cables as per agreement with, and approval of the ECO.
- Possible clearing/ cutting of bush and trees that may foul the stringing of the conductors.

Installation of Pilot Cables

Once the stringing section (approximately 2000m to 3000m depending on the terrain) has been established and agreed upon, the pilot cables/ ropes are run out along the servitude and installed onto the stringing pulley blocks. Should access along the servitude be inadequate for the pulling vehicle due to the presence of wetlands or deep valleys, a light rope or fish line can either be walked through or pulled through by other approved means and the pilot cable then pulled along the servitude. Both ends of the pilot cable are attached to the Puller and the Tensioner, ready for pulling the phase and earth wire conductors.

Stringing Operation

The conductors (one phase at a time) are pulled through the tensioner from the drums and then attached to the Pilot cable. The puller then starts applying tension to the pilot cable to lift the cable off the ground, to a height of 1m to 3m to prevent any damage to the conductors by dragging them on the surface and the clearing of obstacles along the servitude.

Regulating and Sagging

Once stringing has been completed, the conductors are pulled to the required tension as per the sag and tension charts using a dynamometer of sag boards attached to the towers in a predetermined span. The conductors are made of dead-ends applied and attached to the strain towers. Suspension towers and the conductors are placed in the suspension clamps and the pulley blocks lowered to the ground for collection and installation on the following stringing section.

Site Rehabilitation

After the completion of the binding in of the conductors, all pulley blocks and ropes shall be removed from site using the access routes agreed upon. All rubbish will be collected and placed in the required bins for collection and disposal at registered dumping sites. Once the site has been cleared the ECO shall undertake an inspection to see that all the conditions as stated in the EA have been complied with and then sign off the release. Special care shall always be taken when crossing wetlands and river streams in compliance with the requirements of the Water Use License. All site vehicles and equipment shall be equipped with oil drip trays.

2.2.4 DESIGN, CONSTRUCTION AND OPERATIONAL TARGETS

The construction phase for the proposed project will take approximately 24 months to complete and will entail the following process post authorisation:

- **Corridor walk-down:** This will be undertaken by both the Eskom Engineers and the relevant specialists (Fauna & Flora Specialist; Bird Impact Specialist; as well as the Heritage Impact Specialist). The purpose of this walk-down is to ensure that all site specific sensitivities are avoided. During this process the exact design and co-ordinates of the proposed pylons will be established.
- **Construction Camps:** The specific areas will be confirmed during the design phase of the project, also to be visited during the corridor walk-down. These construction sites will be secured by temporary fencing and 24-hour guarding personnel.
- **Vegetation clearance:** A 55 metre (27.5 metres on either side of the power line) servitude is required for the proposed 400kV power line. Tall trees will be cleared along the entire length of the servitude. Maintenance of the vegetation will be done by Eskom during the operational phase of the project.
- **Pylon footings:** Foundations will be laid for the footings of the pylons.
- **Steelwork structures:** The pylons will be erected in segments.
- **Stringing:** Once the pylons have been erected, cables will be strung between the pylons.
- **Feeder bays and Transformers:** Feeder bays and transformers will be erected on vacant land identified adjacent to the existing Ulco DX Substation where the new Ulco TX Substation will be built.

Since the proposed power line will be approximately 94km in length, the aforementioned tasks may occur simultaneously along the power line corridor.

Draft Scoping Report to I&AP's	December 2014
Final Scoping Report submitted to DEA	March 2015
Finalisation of all specialist studies	March-June 2015
Submission Draft EIR and EMP's to I&AP's	September 2015
Submission of Final EIR and EMP to I&AP's, if required	November 2015
Submission of Final EIR and EMP to DEA	November 2015
Environmental Authorisation	January/February 2016
Appeal period ending	February/March 2016
Servitude rights (valuations, negotiations and registrations)	April 2016 – March 2017
Detail Design and Detail Site Overview with Specialists	April 2016 – March 2017
Construction Period	April 2017 – March 2019

CHAPTER 3: ALTERNATIVES

3.1 NO GO ALTERNATIVE

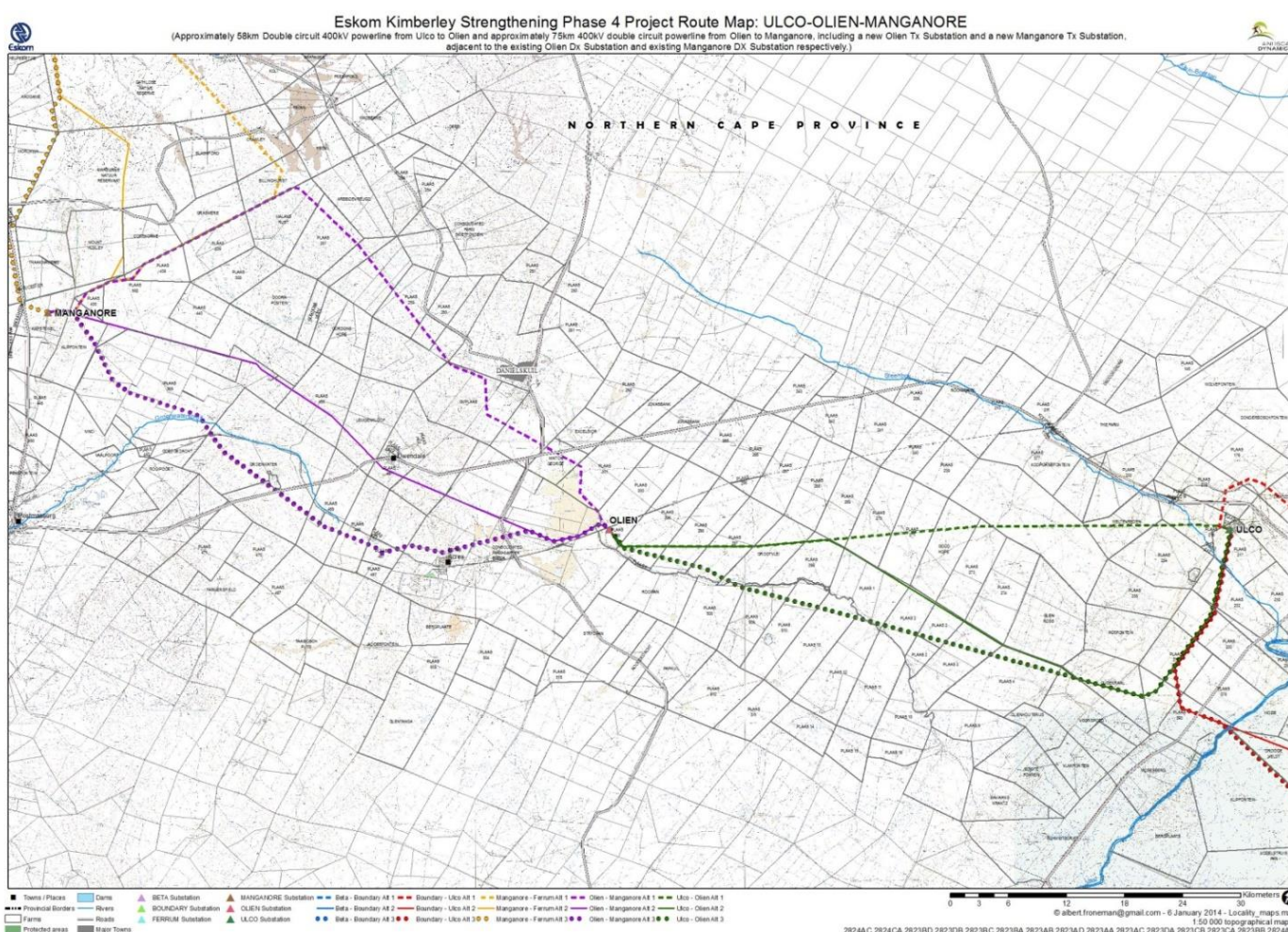
This is the “do nothing” alternative. Under these circumstances no power line will be constructed, a new substation will not be constructed and there would obviously be no changes to the environment.

With this alternative, current and future network constraints under N-1 contingency in the Northern Cape and Free State Provinces will not be alleviated. The reliability of electricity supply to the Northern Cape and Free State Provinces remain a significant concern unless other sources of power generation and transmission are identified and implemented within the very near future. It is important to realise that alternative sources of energy provision are also associated with significant project components and are also subject to relevant legal requirements for which the authorisation process can reasonable take between 12 and 24 months. With increasing economic activity and demand for electricity in these provinces, the regional impact of electricity failures would be significantly increasing.

The “No Go” option cannot be considered a responsible and viable alternative.

3.2 ROUTE ALTERNATIVES INITIALLY PRESENTED AND INVESTIGATED

The route alternatives as per the map below (A3 copy attached in Appendix A.2) were investigated during the site visit which was undertaken by the EAPs, Eskom personnel as well as the specialists in January 2014.



- *Route Alternative 3 – dotted line between Ulco and Olien Substations (southern route) and Route Alternative 3 – dotted line between Olien and Manganore Substations (southern route)*

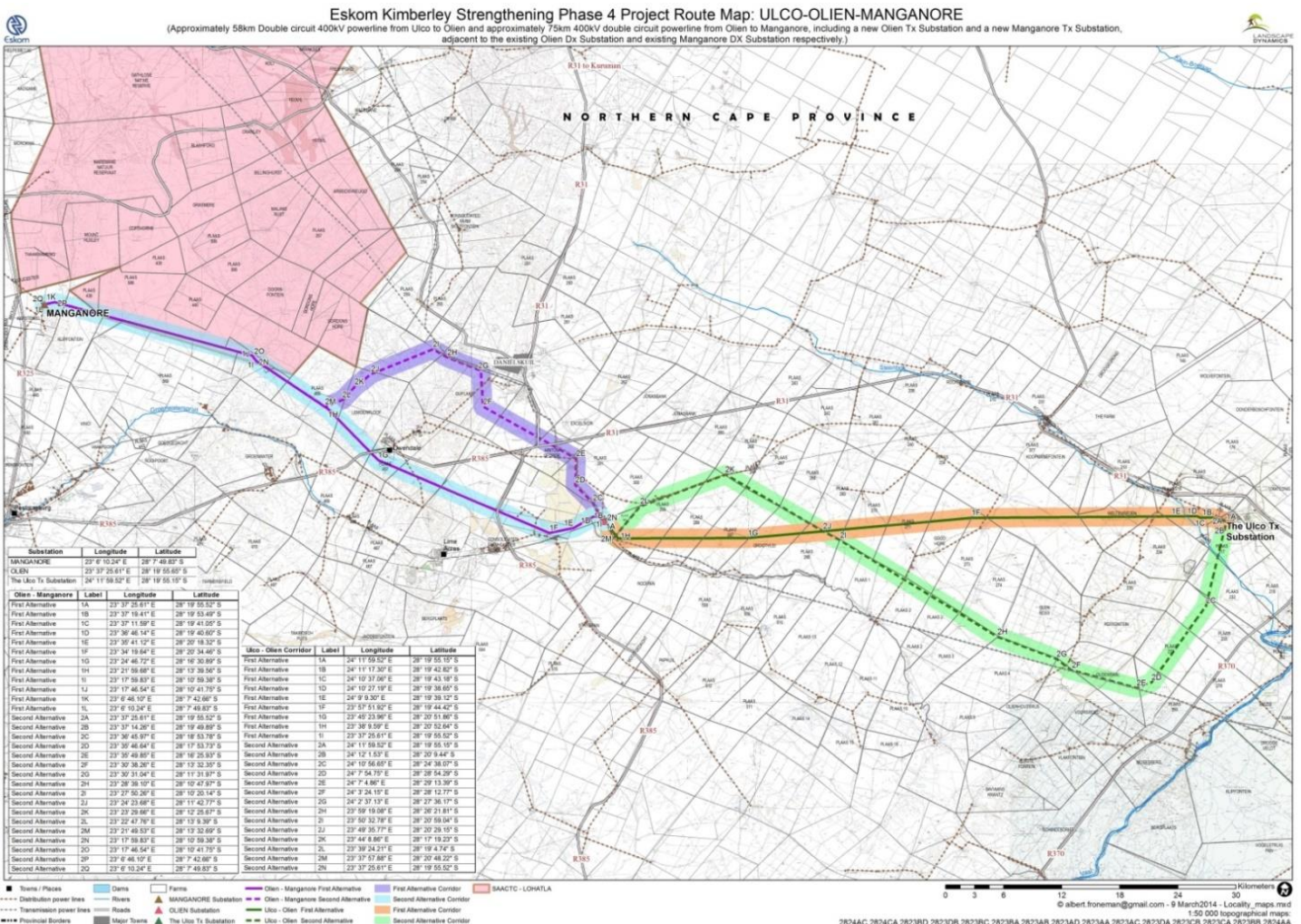
It was very clear that Route Alternative 3 (the southern route between the Ulco and Manganore Substations) will not be feasible due to various environmentally sensitive features within the direct vicinity of this route. This includes pans, wetlands and other habitats with high conservation values. It will not be possible for the power line structures to be placed outside of these areas and impacts could be expected that would be extremely difficult to mitigate. This route could therefore not be seen as viable at all and it was decided at the site meeting that further investigations will not serve any purpose and this route was scrapped as an alternative. It was not presented to the public as an alternative route.

- *Route Alternative 1 – dashed line between Olien and Manganore Substations*

It came to the attention of the EIA team during the site visit that a section of Route Alternative 1, the northern route between the Olien and Manganore Substations as indicated on the map above, transects through the property of the SA Lohatla Army Training Combat Centre, which is a no-fly zone (the pink shaded area in the map below clearly indicates this no-fly zone). This route is therefore, amongst other, not feasible since helicopters are extensively used by Eskom Transmission for construction and maintenance on 400kV power lines. This part of the route was scrapped as an alternative and it was not presented to the public as an alternative route.

Route & Corridor Alternatives as assessed by the specialists and presented as part of the public participation programme (an A3 size map is attached in Appendix A3)

The three route corridor alternatives investigated by the specialists and presented to the public are as follows:



3.3 ROUTE DESCRIPTION

A general description of the macro area of all route corridors is provided below.

The proposed area in which the power lines are to be constructed is located within the Dikgatlong, Kgatelopele and Tsantsabane Local Municipalities. Towns within the area include Ulco, Danielskuil, Koopmansfontein, Lime Acres and Owendale. The Manganore substation at the western extent of the study area is located approximately 21 km north-east of Postmasburg, while the Ulco Substation at the eastern extent of the study area is located adjacent to the Ulco Mine and approximately 39km north-west of Barkley West. The various power line alternatives run either north or south, of the road between Ulco and Postmasburg.

The majority of the landscape is relatively flat, with the area being located between the Ghaap escarpment at Ulco to the east and the Klipfonteinheuwels at Manganore to the west. The surrounding rural landscape consists of relatively flat plains on the Ghaap Plateau dotted with the hills of Asbesberge near Danielskuil and the Klipfonteinheuwels further to the west at Manganore. The edge of the scarp trends in a north-east to south-east direction with a height of approximately 75m to 80m at Ulco. The Ghaap Plateau rises at an average gradient of 1 in 60 in a westerly direction. Small rounded hillocks of up to 15m occur on the escarpment that is incised by a number of seasonal streams that drain towards the Vaal River.

Land use within the study area consists largely of a mix of natural areas and game or livestock farming. Limestone mining takes place at Ulco and Lime Acres/Danielskuil. There are also diamond mines near Lime Acres as well as some salt mining. A number of Eskom power lines already transect the landscape.

In terms of rivers, the study area lies across the watershed between the east flowing rivers into the Vaal River, the south-west flowing river, the Groenwaterspruit, which discharges into the Orange River as the Soutloop River near Boegoeberg and the north-west flowing river, the Ga-Mogara River which discharges into the Kuruman and Molopo Rivers before it too reaches the Orange River at Riemvasmaak. Within the study area, the greatest portion consists of the catchments of the east-flowing tributaries of the Vaal River, the Klein-Riet and the Steenbok Rivers. A wide variety of pans occur largely in the eastern half of the study area which is referred to as the 'panneveld' on many maps. The two large pans, the Great Pan and Rooipan at Lime Acres are the most significant of these features.



View of the typical landscape within the study area, showing some of the depression pans occurring in the area

The geology in the area consists of a mixture of Transvaal, Ventersdorp and Karoo Supergroups which are tertiary to recent secondary deposits with carbonate rocks dominating together with surficial deposits, lavas and sub-ordinate shales and dolerites.

Loose sands and loamy soils can be found over bedrock of shale or calcrete with lime generally present. In general the soils within the western portion of the study area are freely drained, structure-less red soils with a high base status that may have restricted soil depth, excessive drainage, high erodibility and low natural fertility. Within the eastern portion of the area the soils (Mispah and Hutton soil forms) are shallow over hard or weathering rock and are of a restricted depth with lime generally present. The area to the west represents the hillocks where little to no soil is present. Properties that are conducive to the formation of the pans are present within the eastern half of the study area on the Ghaap Plateau.

The study area consists of the following natural vegetation types, Schmidtsdrif Thornveld to the east of Ulco, Ghaap Plateau Vaalbosveld within the central portion between Ulco and Danielskuil. Between Danielskuil and Manganore a mix of Kuruman Mountain Bushveld Kuruman Thornveld, as well as Olifantshoek Plains Thornveld and Postmasburg Thornveld in the western extent of the proposed routes. There are still large portions of these vegetation types remaining and as a result they are all considered to be Least Threatened vegetation types. Other vegetation that may be affected is that of Southern Kalahari Salt Pans (considered Least Threatened) and the riparian vegetation along the various streams in the area. The riparian vegetation along the rivers and streams are in general already in a largely natural to moderately modified condition as a result of farming activities taking place along these rivers.

3.4 RECOMMENDATION IN TERMS OF ROUTE CORRIDORS RESULTING FROM THE SCOPING PHASE

The initially proposed routes (attached in Appendix A3) were presented to all the stakeholders (government departments, municipalities and other) as well as directly affected landowners. The extent and detail of the community consultation is described in detail in Chapter 5. Extensive negotiations and constructive meetings took place with the affected parties and it was proposed to amend the proposed route corridors as supplied in the map below (an A3 size copy is attached as Appendix A4). It was made clear during the consultation process that these proposed routes could still be amended or could even result in a combination of both routes, depending on the outcome of specialist investigations and further community consultation.

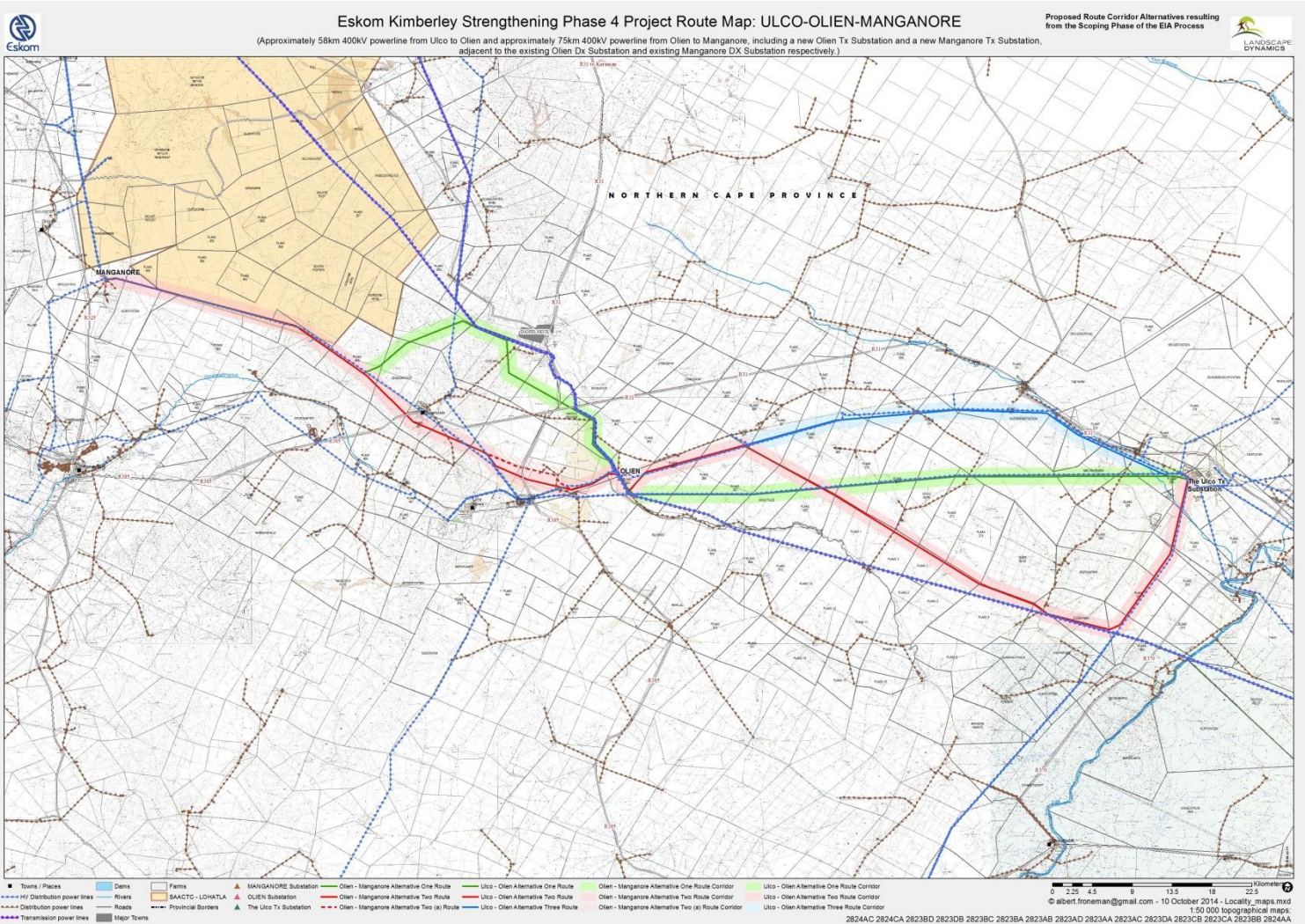
Ulco Substation to Olien Substation (see map below)

- *Alternative 1 (green route)* stays in the same position.
- *Alternative 2 (pink route)* stays the same after the initial change on the southern side of the river.
- *New Alternative 3 (blue route)*: The corridor from Ulco Substation heads northwest towards the R31 and follows the road and runs parallel to the existing Nooibos – Ulco 132kV power line. The corridor then bends west parallel to the Plateau –Nooibos 132kV power line. From the Plateau Substation the corridor follows the Plateau - Trewill 132kV power line in a south-westerly direction, until reaching the area of the Olien Substation. The length of this proposal is approximately 60km.

Advantages: This route runs adjacent to the road and close to existing infrastructure including the R31 road, 132kV power lines and a railway line.

Limitations: The route still crosses game farms, this however seems to be unavoidable in the study area.

Alternative 1 seems to be the best route since it is parallel to existing power lines and crosses already disturbed areas.



Olien Substation to Manganore Substation

- *Alternative 1 (green route)* stays in the same position
- *Alternative 2 (pink route)*: The corridor from the Olien Substation will need to be deviated in the area of the farm Carter Block 458, Hay. There are two alternative deviations, namely Alternative 2 (solid red line) and Alternative 2a (dashed line).

Alternative 2 is recommended since it is shorter and will follow existing power lines and farm boundaries as far as possible. It will also avoid the mining area of Idwala.

The proposed 400kV power lines will not directly affect the residential areas, but will influence rural farms in the area. The power line may cross inhabited farm land, tourist and mining areas. The alternative routes cross over combinations of agricultural, tourist, game farms and mining properties.

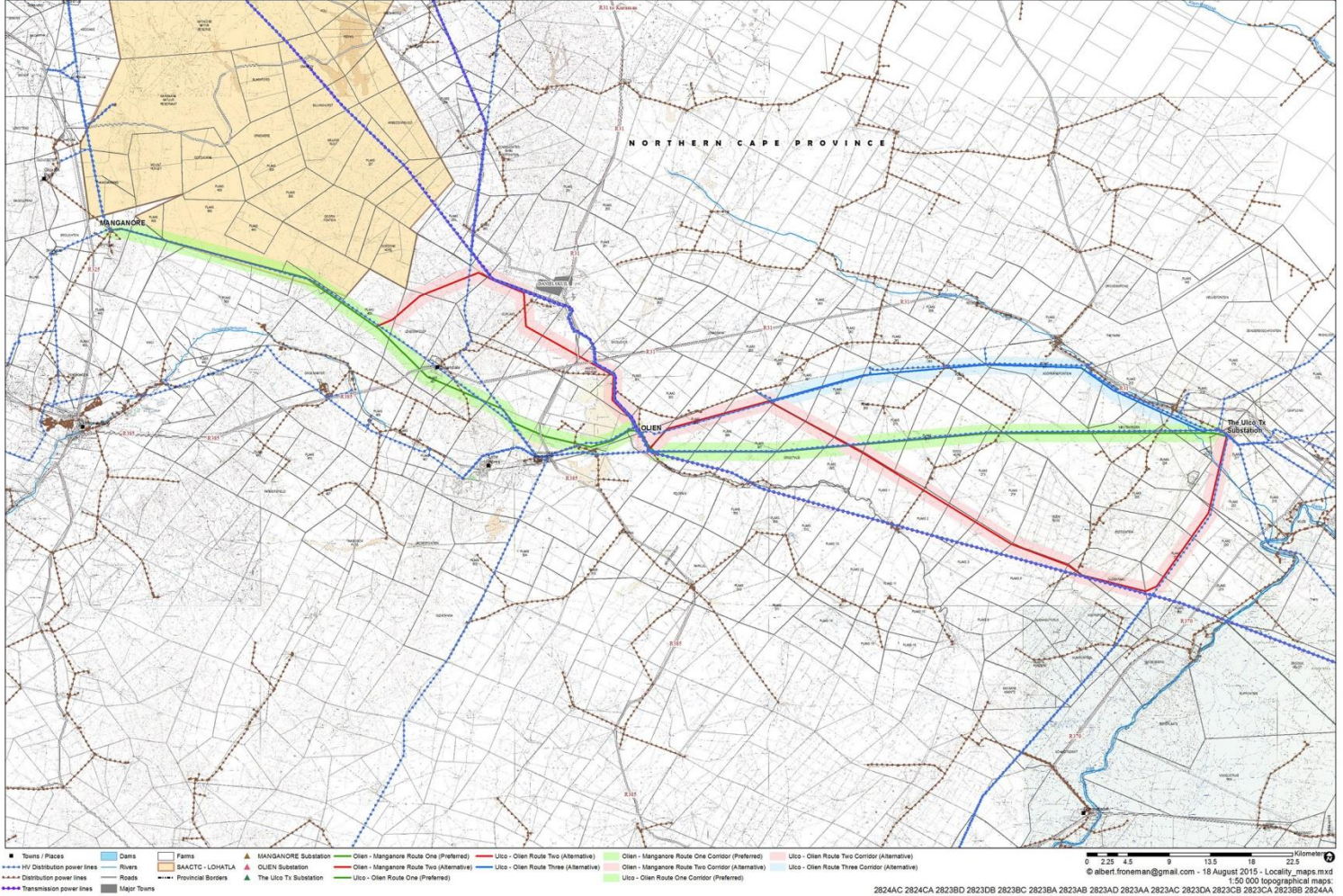
3.5 DESCRIPTION OF THE ROUTE CORRIDORS PROPOSED FOR ENVIRONMENTAL AUTHORISATION

Attached in Appendix A(5) is an A3 copy of the "**Route Map with Preferred Route Corridor and Alternative Route Corridor**" that is proposed for Environmental Authorisation. Also attached as Appendix A(5) is the co-ordinates of the Preferred Route Corridor.



Environmental Impact Report : Proposed Route Corridors (Preferred and Alternative)
Eskom Kimberley Strengthening Phase 4 Project Route Map: ULCO-OLIEN-MANGANORE

(Approximately 58km 400kV powerline from Ulco to Olien and approximately 75km 400kV powerline from Olien to Manganore, including a new Olien Tx Substation and a new Manganore Tx Substation adjacent to the existing Olien Dx Substation and existing Manganore DX Substation respectively.)



ROUTE ONE CORRIDOR (PREFERRED) – Green route

Route description

From Ulco substation on Plaas 217, the line heads west on southern side of the existing Ulco – Olien 132kV and Silverstreams – Ulco 132kV power lines, crossing over Plaas 215, Plaas 234, Weltevreden 214, Plaas 375, Plaas 273, Good Hope 272, Plaas 271 Plaas 270, Plaas 269, Plaas 295, Grootvlei 296, Plaas 297 and Plaas 298. On Plaas 299 the corridor bends north crossing over Plaas 300 into Olien Substation.

The proposed corridor route exits on the northern side of Olien Substation then turns south west, parallel to the Olien – Silverstream 132kV power line, crossing over Carter Block 458. On portion 7 of Carter Block the corridor bends parallel to the southern boundary and crosses over portions of Carter Block 458. The corridor crosses Plaas 457, passing on the southern side of Owendale, followed by Lemoenkloof 456, until Plaas 455. On Plaas 455 the corridor bends parallel to the existing Manganore – Silverstreams 132kV power line, until it reaches Manganore Substation. The route is designed to avoid the Lohatla Military Base property which is a “no fly zone”. High voltage power lines require helicopters during construction and maintenance phases.

Recommendation

During consultation with land owners it became apparent that it will be preferred if the proposed power line can be as close as possible to farm boundaries and existing power lines and it should have the smallest possible impact on properties. The mining area of Idwala should also be avoided.

It also makes economic sense to recommend the shortest route as the preferred route option.

The specialist studies undertaken for this project concluded as follows:

Freshwater Impact Assessment

All of the proposed activities for the proposed route alternatives will have a low to no significance impact with mitigation (including final route selection), both within the construction and operation phases of the project.

Fauna & Flora

In general the different vegetation types should not experience a permanent or long term negative impact if all mitigation measures are applied. Based on an ecological perspective (in sequence of preference) Alternative Corridors 3 and 1 would be preferred from Ulco to Olien, while either Alternative Corridors 1 or 2 would be preferred from Olien to Manganore. These routes will have the least ecological influence and are generally already influenced by roads, current power lines and other human influences.

Avifauna

The Route One Corridor as proposed in the EIR route alignments emerged as the combination with the lowest risk score and is the preferred route alignment from an avifauna perspective.

Heritage / Cultural / Archaeology / Palaeontology

There is no specific preference for any of the route alternatives.

Visual

Ulco-Olien: The potential impact is high, but spatially concentrated. Both Route Options 1 and 3 are acceptable within the context of the study area as the impact is contained and has been rerouted to avoid major conflicts with sensitive land uses.

Olien-Manganore: From a visual impact perspective both of the alternative two route corridors are supported.

The Preferred Route One Corridor alignment as proposed is preferred by landowners because it is as close as possible to farm boundaries and existing power lines and would have a small impact on properties and agricultural activities. It is the shortest route and also has the support of the various specialist studies undertaken. The mining area of Idwala is also avoided.

This route is therefore proposed for Environmental Authorisation.

ROUTE TWO CORRIDOR (ALTERNATIVE) – *Pink route*

The proposed corridor route heads south from Ulco Substation parallel to the Herbert – Ulco 132kV power line on the western side of R370 from Delpportshoop to Schmidtsdrift. The route then bends, on Plaas 293 in a western direction parallel to the Boundary – Olien 1 and 2 275kV power lines. On Voorspoed 5 the line bends north-west, crossing Plaas 4, Plaas 3, Plaas 2, Plaas 1, Plaas 295, Grootvlei 296, Plaas 297 along farm boundaries until reaching the Plateau – Trewill on Plaas 298. The corridor bends parallel to this existing 132kV until reaching Olien Substation on Plaas 300.

This is the most northern alternative and is mostly parallel to existing Olien – Ferrum 1 and 2 275kV power lines. From the Olien Substation the line heads north-west crossing the R385 and R31 to pass on the southern side of Danielskuil and Idwala Lime Plant. On Doorn Vlei 305 the line bends south west crossing over Lemoenkloof 456 until Plaas 455 where the corridor continues as in alternative 1.

ROUTE THREE CORRIDOR (ALTERNATIVE) (between the Ulco and Olien substations) – *Blue route*

This corridor exits Ulco Substation similar to alternative 1 on the western side of the substation and then turns parallel, on Plaas 215, to the existing Nooibos – Ulco 132kV power line. It crosses over Weltevreden 214, Plaas 213, Koopmansfontein 212. On Plaas 377, the corridor bends west parallel to the Nooibos – Plateau 132kV power line, crossing over Plaas 210, Plaas 239, Plaas 240, Plaas 241, Plaas 269. It passes Plateau substation and continues parallel to Plateau – Trewill 132kV power line crossing over Plaas 268, Plaas 267, Plaas 266. On Plaas 298 the corridor follows alternative 2 until reaching Olien Substation.

CHAPTER 4: RECEIVING ENVIRONMENT

4.1 BIOPHYSICAL ENVIRONMENT

4.1.1 CLIMATE

Danielskuil normally receives about 269mm of rain per year, with most rainfall occurring mainly during summer and autumn with very dry winters. The lowest rainfall (0mm) occurs in June and the highest (66mm) in March. The average midday temperatures for Danielskuil range from 15.8°C in June to 31.8°C in January. The region is the coldest during July when the mercury drops to -0.2°C on average during the night.

4.1.2 GEOLOGY, SOILS & GROUNDWATER

An *Engineering Geological Investigation* was undertaken by Geoset CC and is attached in Appendix C(1). A summary thereof is provided below.

The proposed alternative corridors between the Ulco, Olien and Manganore Substations were investigated to determine the expected engineering geological properties that will influence the placement of pylons:

Topography

The site is located from flat areas to a gentle to low gradient slopes with small dolerite koppies or hills, with average elevations of 1100 MASL at the Ulco Substation and 1440 metres above mean sea level at the Manganore Substation, below the koppie, confirming the relative flatness of the area. The Ghaap Plateau and Asbesberg mountain (west of Lime Acres) and the smaller Klipfonteinheuwels (at Manganore Substation) mountain ranges are intersected by the power lines.

Site Geology

The general thickness of the soil cover will in general marginally decrease moving from east to west, and will increasingly be covered by recent Aeolian dune sand, underlain by calcrete presented as hard pan calcrete.

Although the geology map indicates the presence of dune sand as Qs: Aeolian dune sand of red and grey colour, and calcrete as Qc: Calcrete, calcified pandune and surface limestone, it is evident that the aeolian dune sand covers the calcrete in many places which is found in depth, and it is present along these corridors.

The south-eastern area is underlain by recent Aeolian dune sand, underlain by calcrete or dolomite, dolomitic limestone, chert and lenses of limestone and shale and chert, of the Ghaap Plateau and Schmidtsdrift and Vryheid Formations of the Campbell Group of the Griqualand West Supergroup. The Ulco (Vgh/Vgu) Member of the Ghaap Plateau was found northwest of Ulco and consist of fine grained dolomite and stromatolitic limestone with interbedded chert, with a banded iron formation at the top, underlain by the Vryburg Formation (Va/Vv) comprising siltstone, shale, quartzite, gritstone and conglomerate.

Andesitic lava of the Allanridge Formation (Vo/Ra), Platberg Group of the Ventersdorp Supergroup comprises the small portion southwest of the corridor between Olien and Manganore Substation. It consists of amygdaloidal or porphyritic andesitic lava, quartzite and conglomerate, in many places covered by aeolian sand and calcrete gravel.

The Asbestos Hills Ironstone Formation of the Griquatown Group, Griqualandwest Supergroup west of Danielskuil comprises the largest western areas, and it consist of banded ironstone, with amphibolites and crocidolite. The upper soil may only consist of Aeolian dune sand and should be removed for construction on underlying competent bedrock or calcrete.

There are two limestone quarries mined in the area west of Ulco including Lime Acres and some economic deposits may occur along the corridors, and it should be addressed during the final geotechnical ground survey, should it be required. The locality of diamondiferous gravel mines were noted on the farm Gorrakop 234 and Klipfontein 235 within the proposed corridors, as well as the large Finch open cast mine.

Asbestos and crocidolite were mined at the Old Danielskuil, Groenwater and Postmasburg asbestos mines.

The bedrock is in many portions covered by transported material which may consist mainly of dune sand.

Groundwater Conditions

Drainage mainly takes place through sheet wash and a few drainage channels and pans are present adjacent to the corridors. Drainage occurs in a south-easterly direction to the Klein Riet River, a tributary to the Vaal River, and in a south-westerly direction towards the Groenwaterspruit, west of Postmasburg into to the Orange River. The confluence of the Vaal River and Orange Rivers were noted far south of the investigated area. The river crossing at three intervals of the Klein Riet River needs extra attention and the 1: 100 year flood lines should be determined and used in spacing the pylons.

The permanent water table on site is expected to be deeper than 1,5m below natural ground surface. A perched water table within the Aeolian sand may exist on shallow bedrock with low permeability characteristics of the rock mass, during long periods of consistent rain.

Soil Profiles

All terrain land forms or mapping units should be sampled and more than adequate characterization of each represented soil horizon should be determined through evaluation of the gathered information.

The typical natural soil profiles of the test pits with substantial soil cover must be represented as an overall impression by the profiler and the complete logs should be considered for specific details, and some photos should be taken of rock outcrop and shallow rock for a visual characterization.

In many areas difficult excavation can be expected along the corridors, and a competent TLB, pneumatic tools and even blasting may be required to reach installation depths for services, or for the placement of the pylons. Refusal of a normal TLB is expected in almost all test pits, typically at depths less than 1,5m in depth. To ensure the stability of excavations, it will need standard sidewall protection

Slope Stability and erosion

The potential for lateral soil movement or erosion is medium, and the Aeolian sand can easily be washed away during thunderstorms. Except for local slope instability within opened trenches specifically within shale or layered mudstone, and the possible collapse of unstable open pit side walls encountered, no other slope instability is expected within these relative flat areas.

All open excavations exceeding 1,5m in depth must be supported.

Excavation classification with respect to services

Problems regarding excavatability can be expected along the routes, with some outcrop and sub outcrop areas possibly classified as medium hard rock excavation in restricted and non-restricted excavation (SANS 1200 D).

The area may be classified regarding excavation properties and it can range from easily excavated by hand to intermediate excavation where a competent TLB, pneumatic tools and even where blasting is required.

Unstable pit side walls may be encountered and to ensure the stability of excavations, it will need standard sidewall protection in excavations exceeding 1,5m.

Impact of the geotechnical character of the corridors on the placement of pylons

During the final engineering geological investigation it is essential to determine and quantify the extent of potential problems associated with the area. The ideal conditions may be listed as follows:

- A smooth surface gradient with slopes less than 12E. Accessibility should not be restricted by topography (plateau areas).
- No potential for slope instability features - landslides, mud flows.
- Easy excavation for foundations and installation of pylons.
- Foundations above the ground water level or perched water table, with not too low permeability.
- Development above or outside the 1:100 year flood line.
- Adequate surface and subsurface drainage conditions, with minimal erosion potential.
- No presence of problematic soils, for example heaving clays, compressible clays, sand with some collapse potential, or dispersive soils, that will require expensive remedial measures.
- No potential for surface subsidence due to the presence of dolomite (sinkholes) or undermining.
- No damaging differential subsidence or movement (less than 5mm total movement at the surface allowed).
- The site should be placed away from potential pollutants such as waste disposal or sewer sites.

Evaluation for the placement of pylons

No seepage or the presence of perennial fluctuations of ground water was encountered on site, but a seasonal perched water table may exist on top of the bedrock or within the pedogenetic layer comprising nodular or hard pan calcrete.

Special care must be taken to ensure adequate surface drainage to prevent the accumulation of water next to structures.

The area may contain low and low to medium expansive soil, and together with a medium compressible and a highly collapse potential, foundations will need special precautionary measures to minimize soil movement associated with a variation in moisture content of the soil.

Some problems regarding excavatability can be expected on calcrete and within the ironstone and dolomite and special equipment such as large excavators and blasting will be required for the placement of services.

A dolomite stability evaluation may be required as large areas within the investigated area contains dolomite and limestone of the Griqualand West Supergroup, as some sinkholes and dolines can be expected and can possibly form, especially within the mined areas where the water table is drawn down to enable the mining and as such combined with blasting act as a trigger mechanism for the activation of a sinkhole.

Retaining walls as well as slope stabilization measures are recommended on all constructed embankments exceeding 1,5m, as unstable pit walls may be encountered.

Storm water control measures such as ponding pools are recommended to control peak flows during thunderstorms. All embankments must be adequately compacted and vegetated with grass to limit any excessive erosion and scouring of the landscape.

Some mining activities on site or history of mining or contaminated land in the area were found, and limestone and gypsum mining as well as alluvial and Kimberlite diamond mining occur regularly in the area.

The likelihood for the development of borrow pits along the routes should be investigated to provide construction material, or this can be sourced from overburden material from the existing mines.

All road building and construction materials will in the interim be sourced from established commercial activities in and around the existing mines.

The placement of the Eskom pylons is possible along the routes if the recommended precautionary measures and possibly difficult excavation of service and foundation construction is anticipated.

Drainage

The corridors are located on shallow slopes less than 4%, with some steeper slopes next to the ironstone koppies, usually affected by the placement of the pylons.

Drainage takes place through sheet wash, and two prominent drainage channels intersects the corridors, with some large pans in the centre portions near Olien.

Drainage generally occurs in a south-westerly (or north-easterly) direction towards the Vaal River, and then south to the Orange River.

No seepage or the presence of perennial fluctuations of ground water was encountered on site, but a seasonal perched water table may exist on top of the shallow bedrock sandstone, mudstone, lava, lime stone, dolomite, ironstone or where calcrete nodules or hard pan calcrete is expected.

Ground water in the form of seepage may be intersected in some test pits during the final field investigation, and some problems are foreseen and normal water tightening techniques such as damp course on foundation levels may be required.

The aeolian sand is expected to exhibit a moderate to high permeability, which possibly accounts for the absence of a connected network of proper drainage features between the pans.

Special care must be taken to ensure adequate surface drainage to prevent the accumulation of water next to structures. Storm water diversion measures such as ponding pools are recommended to control peak flows during thunderstorms. All embankments should be adequately compacted and planted with grass to stop any excessive erosion and scouring of the landscape.

Development Zones

Provisional development zones were determined, indicating the expected geotechnical conditions of each site class: *Potentially low to medium expansive and compressible and highly collapsible* soil with thickness up to 750mm which classified as site class C2H1 (with up to 10mm differential movement measured at surface) requiring *special foundations* varying through to site class HCR (with less than 7,5mm soil movement measured at surface) requiring *normal or modified normal construction* or a soil raft, with associated site drainage provisions. Substantial financial implications are expected in Geotechnical Zone PR where scattered rock, shallow rock and rock outcrop are expected, but will possibly prove as excellent and stable foundation material for the pylons.

4.1.3 SURFACE WATER

A Freshwater Assessment was undertaken by BlueScience CC and is attached in Appendix D(3) based on the route map provided in Appendix A(3) "*Route Map of Corridor Alternatives resulting from the Scoping Phase*" and a Freshwater Constraints Map is provided in Appendix A5. A short summary thereof is provided below.

The freshwater assessment is intended to inform the authorisation process for the proposed Eskom Kimberley Strengthening Phase 4 Project. Three alternative routes were considered in the Scoping Phase (and described in detail in the Scoping Report) and two final routes considered for the Environmental Impact Phase, where a 2km wide corridor was investigated for all the route alternatives. A 5km radius was also considered around the substation sites.

Aquatic features which occur within the study area include the following:

- The Klein-Riet and the Steenbok River Systems, which are east flowing tributaries that originate near Danielskuil and drain the Ghaap Plateau before discharging into the Vaal River upstream of Smidtsdrif;
- The Groenwaterspruit, south-west flowing tributary of the Skeifontein River which discharges into the Orange River as the Soutloop River near Boegoeberg;
- The Ga-Mogara River which flows to the north-west before discharging into the Kuruman River and then the Molopo River. The Molopo River has its confluence with the Orange River at Riemvasmaak.
- A wide variety of pans occur largely in the eastern half of the study area which is referred to as the 'panneveld' on many maps. The two large pans, the Great Pan and Rooipan near Lime Acres are the most significant of these features.

All of these freshwater features tend to be seasonal to ephemeral, mostly only carrying water for short periods of time during the rainy season (March-April). These features provide some habitat for biota and in particular avifauna but are usually also usually subject to cycles of degradation and regeneration as a result of grazing of livestock.

The habitat integrity of the Klein-Riet River is deemed to be in a moderately to largely modified ecological state while the Steenbok and Groenwaterspruit are in a largely natural to moderately modified state. The Ga-Mogara River in its upper reaches is located within the South African Army Combat Training Centre and is still in a largely natural state. The riparian habitat of these rivers tends to be more impacted by the surrounding activities. The ecological importance and sensitivity of the rivers assessed is deemed to be moderate.

The pans in the study area are subjected to physical habitat modification with some flow and water quality modification largely as a result of the surrounding farming and peri-urban activities, as well as some mining activities in or adjacent to the larger pans. In terms of the current ecological state of the wetland areas, they are as a whole considered to be in a moderately modified state, with the smaller pans in general in a less impacted ecological state. In terms of goods and services, the larger provide more valuable goods and services. Goods and services provided by the pans include some flood attenuation and sediment trapping functionality, as well as the provision of natural resources such as salt and habitat for aquatic life (water birds such as flamingos).

All of the proposed activities for the proposed route alternatives will have a low to no significance impact with mitigation (including final route selection), both within the construction and operation phases of the project.

Due to the relatively small extent of the pans within the area, the alignment of the route within the corridor of either route could rather be determined to minimise the number of freshwater features and their buffers crossed and have the least potential impact on the freshwater features within the study area. This is with the exception of the Great Pan near the Olien Substation, which will need to be passed either to the east or south of the pan, allowing for the recommended buffer.

Where the proposed power lines are located close to freshwater features it is proposed that a buffer of 50m from the centre of the drainage lines and approximately 500m (varies depending on wetland cluster) from the edge of the pans be implemented. The new Olien Substation should preferably be placed west of the existing substations and as close to the railway line as possible. There are no freshwater features within a 5km radius of the Manganore substation.

A water use authorisation may need to be obtained from the Department of Water Affairs Northern Cape Regional Office for approval of the water use aspects of the proposed activities.

4.1.4 VEGETATION

A Vegetation and Faunal Report based on the route map provided in Appendix A(3) "Route Map of Corridor Alternatives resulting from the Scoping Phase" and an Ecological Sensitivity Map is provided in Appendix A5. The main findings are summarised as follows:

Vegetation types

On a small scale the proposed routes fall within the savanna biome and within a larger regional scale the proposed routes are according to Mucina & Rutherford (2006) located within the Eastern Kalahari Bushveld Bioregion (SVk). Seven different vegetation types could be identified:

Schmidtsdrif Thornveld (SVk6)

This vegetation type occurs on slightly undulating plains with a well-developed woody layer with *Acacia tortilis*, *Acacia karroo*, *Boscia albitrunca*, *Acacia mellifera*, *Acacia erioloba* (sparse), and *Tarchonanthus camphoratus*. It occurs on Dwyka diamictites and Ecca shales of the Karoo Supergroup.

From a conservation point of view it is regarded as being a least threatened vegetation type, although only 2% is statutorily conserved. The vegetation is mostly used for cattle and game farming.

Ghaap Plateau Vaalbosveld (SVk7)

The Ghaap Plateau Vaalbosveld vegetation type occurs on relatively flat plateau areas south and east of the town Danielskuil in the Northern Cape Province. The area comprises of surface limestone, calcrete, dolomite and chert ridges. The soil is flat rocky outcrops or otherwise shallow, stony soil of the Mispah and Hutton soil forms.

The vegetation is dominated by the woody species *Olea europaea* subsp. *africana*, *Tarchonanthus camphoratus*, *Euclea crispa*, *Euclea undulate*, *Diospyros austro-africana*, *Acacia karroo*, *Acacia mellifera*, *Searsia lancea*, *Acacia hebeclada*, the grasses *Cenchrus ciliaris*, *Digitaria eriantha*, *Themeda triandra*, *Enneapogon scoparius*, *Aristida adscensionis* and the forbs *Geigeria filifolia*, *Hermbstaedtia odorata*, *Limeum fenestratum* and *Aloe grandidentata*.

Although none of this vegetation type is statutorily conserved it is regarded as a least threatened vegetation type with minor erosion degradation.

Kuruman Thornveld (SVk9)

The vegetation is characterised by an open to closed woody layer. The topography ranges from areas with rocky plains to ridges, with "rocky pavements" in the proposed areas, with a dense woody layer. The vegetation type has also isolated, sparse, red, wind-blown, deep sandy texture soil.

The vegetation is dominated by the woody species *Tarchonanthus camphoratus*, *Grewia flava*, *Lycium hirsutum*, *Acacia erioloba*, the grasses *Eragrostis lehmanniana*, *Aristida stipitata* and *Aristida meridionalis*. Important taxa: *Acacia haematoxylon*, *Blepharis marginata*, *Digitaria polyphylla* and *Corchorus pinnatipartitus*. Endemic taxon: *Gnaphalium englerianum*

Although none of this vegetation type is statutorily conserved it is regarded as a least threatened vegetation ecosystem.

Kuruman Mountain Bushveld (SVk10)

The Kuruman Mountain Bushveld (SVk10) (Mucina & Rutherford 2006) comprises rolling hills with gentle to moderate midslopes. The vegetation is mostly open shrubveld with shallow sandy texture soil of the Hutton soil form.

The vegetation is characterised by the dominance of the shrub *Searsia ciliata* with the grasses *Andropogon chinensis*, *Andropogon chirensis*, *Antheophora pubescens*, *Themeda triandra*, and *Triraphus andropogonoides* co-dominant. The protected geophyte *Boophone disticha* is also present within this vegetation type.

Although none of this vegetation type is statutorily conserved it is regarded as a least threatened vegetation ecosystem with little erosion. This vegetation type is mostly used for grazing purposes with heavy grazing evident in some areas.

Olifantshoek Plains Thornveld (SVk13)

The vegetation and landscape is characterised by wide plains with open tree and shrub layers while the grass layer is not well-developed. The deep (>1.2m), aeolian, sandy soil is red. Silcrete, calcrete and lavas of the Griqualand West Supergroup were also found in this vegetation type.

The vegetation is dominated by the small tree *Boscia albitrunca* and the grasses *Schmidtia pappophoroides* and *Stipagrostis uniplumis*. Other prominent species include *Acacia erioloba*, *Terminalia sericea*, *Tarchonanthus camphoratus*, *Rhigozum obovatum*, *Digitaria eriantha* *Pollichia campestris*, *Acanthosicyos naudinianus* and *Oxygonum delagoense*.

Although none of this vegetation type is statutorily conserved it is regarded as a least threatened vegetation system with little erosion. A small section of this vegetation type is conserved in the Witsand Nature Reserve.

Postmasburg Thornveld (SVk14)

The area comprises flats surrounded by mountains with open shrubby thornveld. The vegetation structure is mostly a dense shrub layer with few trees and a sparse grass layer. The deep (>1.2m), aeolian, sandy soil is red. Silcrete, calcrete and lavas of the Griqualand West Supergroup were also found in this vegetation type.

The vegetation is dominated by the small tree *Boscia albitrunca* and the grasses *Schmidtia pappophoroides* and *Stipagrostis uniplumis*.

None of this vegetation type is statutorily conserved, but little is transformed and it is regarded as a least threatened vegetation system with little erosion.

Southern Kalahari Salt Pans (AZi4)

These areas are described as systems of endorheic closed pans with low grasslands and often devoid of vegetation. Dwarf shrubs often dominate the edges of the pans. The soil is white comprising clay and sandy clay with a high pH reaching values of 9. The pan bottoms are dry for most of the year with water collecting in the central parts during rainfall events only.

The vegetation is characterised by the dominance of *Sporobolus* grass species and *Enneapogon desvauxii* while the succulent shrub *Zygophyllum tenue* and the shrubs *Lycium* spp and *Rhigozum* spp. are prominent.

This vegetation type is regarded as least threatened though the pans are subject to some degradation caused by animals grazing in the area during the wet season especially.

Vegetation units

The study area comprises natural vegetation used mainly for domestic stock grazing as well as free moving game species. The area comprises seven different vegetation units all mostly natural in species composition.

The ***Tarchonanthus camphoratus* shrubland (Vegetation Unit 1)** occurs within the western section of the proposed powerline corridors. The vegetation is natural although some degradation due to grazing is evident in some areas.

This vegetation unit occurs over a large area in this region and is regarded as a common vegetation type not threatened. Thus from a plant ecological and ecosystem functioning point of view this area has a low-medium conservation value.

The ***Tarchonanthus camphoratus-Senegalia mellifera* shrubland (Vegetation Unit 2)** is located mostly on the corridors stretching from Olien to Manganore. The vegetation has a moderate to low species richness but is degraded and dominated by the shrubs *Tarchonanthus camphoratus*, *Senegalia mellifera* and *Vachellia tortilis*. The area is mostly used for grazing by animals.

From a plant ecological and ecosystem functioning point of view this vegetation unit is regarded as having a low-medium conservation value.

Although Vegetation Unit 2 is not threatened and no red data species were recorded, it is advisable that the placement of the pylons is physically verified in the field during a walkdown exercise by a qualified ecologist to ensure that micro-habitats within the scattered calcrete and limestone outcrops are not affected.

The ***Tarchonanthus camphoratus-Searsia ciliata* shrubland (Vegetation Unit 3)** is located west of the town of Danielskuil within the Kuruman Thornveld (SVk9) vegetation type. The area has a relatively low species richness with a low vegetation cover.

This vegetation is common within the region and is not regarded as threatened. It is mainly used for grazing by domestic animals and game. From a plant ecological and ecosystem functioning point of view this area has a low to medium conservation value.

The ***Tarchonanthus camphoratus-Schmidtia pappophoroides* open woodland (Vegetation Unit 4)** occurs as a small area along the proposed corridor between the town of Danielskuil and Manganore power station. The vegetation is mostly natural with a moderate species richness comprising climax species mostly. The vegetation is mostly used for grazing by domestic animals and game.

The declining red data tree *Vachellia erioloba* is prominent in this vegetation unit and consists mainly of large individuals taller than 5m. This vegetation unit is from a plant ecological and ecosystem functioning point of view regarded as having a medium conservation value.

Vegetation Unit 5 (*Olea europaea* subsp. *africana*-*Aristida meridionalis* woodland) has a moderately high species richness with mostly climax species present. This unit is relatively different from any other of the units due to a different vegetation composition and structure. The scattered low-lying rocky outcrops and hills form important habitat for rupicolous faunal species such as Elephant Shrews, Rock Hyrax, Southern Pygmy Toad as well as several reptile species and are considered as sensitive.

The proposed towers should be positioned away from any major rocky outcrop. This unit is fairly natural and regarded as having a medium conservation value.

The ***Panicum coloratum-Eragrostis bicolor* grassland (Vegetation Unit 6)** is associated with the floodplain on the plains landscape of the Ghaap plateau. These areas form depressions that collect water during high rainfall events. The area is classified as a seasonally wet wetland and is regarded as sensitive ecosystems that should be protected. No rare or endangered species were observed, but this area is regarded as having a medium-high conservation value from a plant and animal as well as ecological and ecosystem functioning point of view.

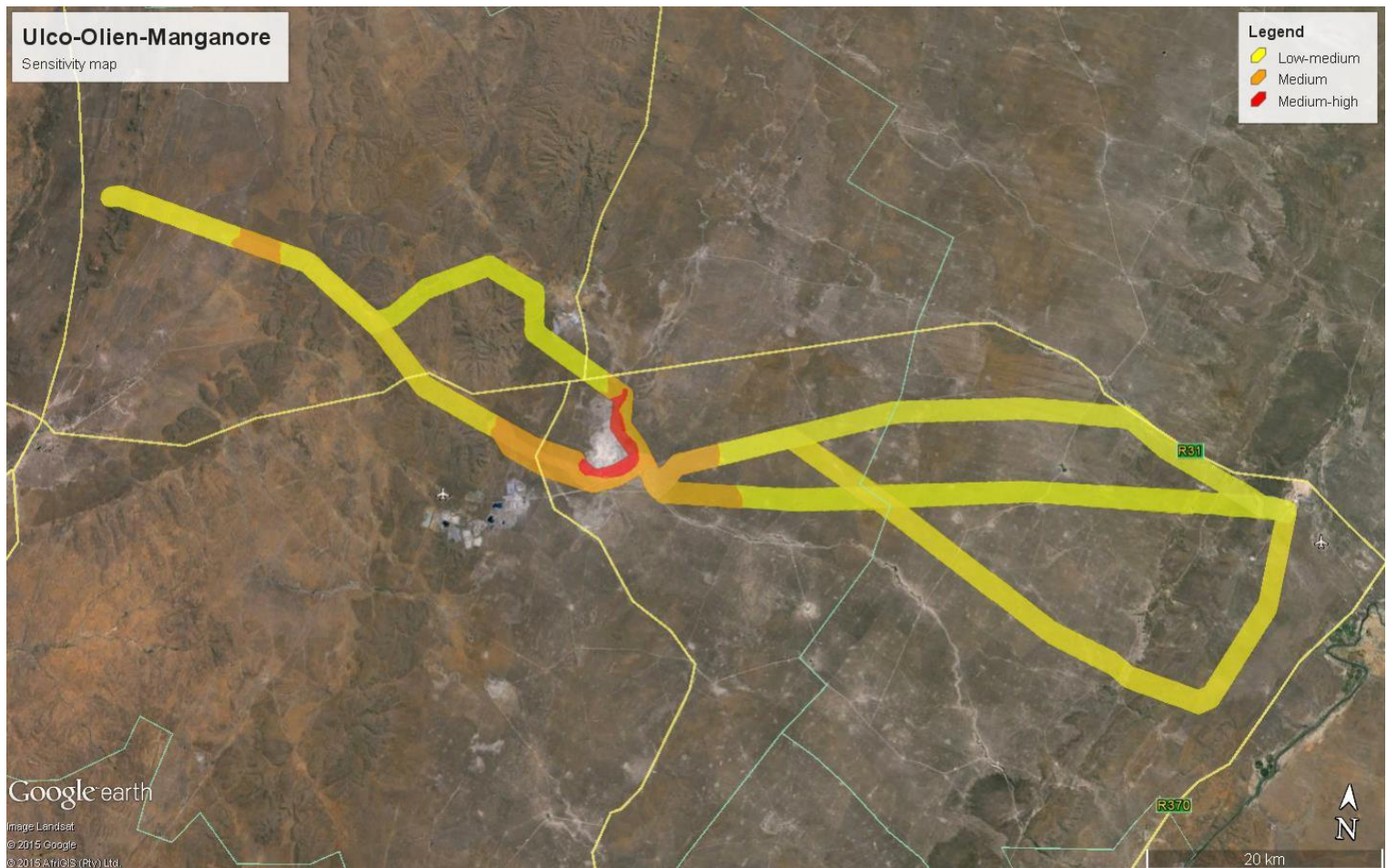
The ***Searsia lancea-Tarchonanthus camphoratus* shrubland (Vegetation Unit 7)** is dominated by the shrub *Tarchonanthus camphoratus* that seems to have densified in some areas. The unit has a moderate to low species richness and is degraded due to cattle grazing and also other human induced influences (e.g.

power lines, roads etc) that contributes to a degraded condition in large areas.

The declining red data tree *Vachellia erioloba* was found to be present in low numbers within this unit. From a plant ecological and ecosystem functioning point of view this unit has a low-medium conservation value.

Sensitivity analysis

A sensitivity analysis was done for the seven vegetation units identified. The results indicate that Units 1, 2, 3 and 7 have low-medium sensitivity while Units 4, 5 and 6 have medium sensitivity (mostly due to the threatened species present) and Unit 6 due to it being a seasonal wetland.



Red data species

Only one red data species which is also a protected species namely *Vachellia erioloba* (camel thorn) was found to be present in the study area. This species has a conservation status of “declining” due to its removal for fire wood and other agricultural activities.

Protected species

The Department of Forestry and Fisheries developed a list of protected tree species. In terms of Section 15(1) of the National Forests Act, 1998, no person may cut, disturb, damage or destroy any protected tree or possess, collect, remove, transport, export, purchase, sell, donate or in any other manner acquire or dispose of any protected tree or any forest product derived from a protected tree, except under a license or exemption granted by the Minister to an applicant and subject to such period and conditions as may be stipulated. Trees are protected for a variety of reasons, and some species require strict protection while others require control over harvesting and utilisation. The Department of Agriculture, Forestry and Fisheries (DAFF) will have to be approached to obtain the required permits for the removal of any protected tree species. The most recent list of protected tree species was published in GN 908 of 21 November 2014.

One protected species (which is also a declining red data species), namely *Vachellia erioloba* (camel thorn) has been recorded within the study area.

The DAFF / Eskom developed a document in 2012 titled: “Basic Guidelines for the handling of EIAs and License Applications for Eskom SOC Holdings Linear Infrastructure affecting Natural Forests, Protected Trees or State Forests”. According to this document and in relation to new planned Eskom linear infrastructure, “protected trees do not need to be removed from the whole servitude, only from under the lines (this is not necessary for smaller tree species such as Shepherd’s trees) and trees in the way of towers to be erected”. The Northern Cape is a semi-arid region and unnecessary clearance of vegetation may expose soil, subjecting it to wind erosion that may take many years to recover after disturbance.

Medicinal species

Three medicinal plant species have been identified within the study area. These plants occur throughout the southern African region on various soil types and areas. None are threatened species.

Plant name	Plant part used	Medicinal use	Vegetation Unit
<i>Lippia javanica</i>	Leaves & twigs	Coughs, cold, stomach problems, bronchitis, headaches	7
<i>Tarchonanthus camphoratus</i>	Leaves & twigs	Stomach trouble, headache, toothache, inflammation	1, 2, 3, 4, 5, 7
<i>Ziziphus mucronata</i>	Roots, bark or leaves	Cough & chest problems; diarrhea; pain relief	1, 2, 3, 4, 5, 7

Alien plant species

A total of two different declared alien invasive species, the tree *Opuntia ficus-indica* (Unit 2) and *Cylindropuntia imbricata* (Unit 1) were found within the study area.

Opuntia ficus-indica and *Cylindropuntia imbricata*, are declared category 1 weeds (CARA) and category 1b plants (NEMBA). All category 1 plants must be removed and eradicated by the land owner by law. It is therefore important that these plants are removed from the different vegetation units and that a programme is implemented on a long-term basis to control the spread of these plants.

Indigenous invader plant species

One indigenous invader species namely *Acacia mellifera* was found to be present in the study area. This species is part of the natural ecosystem and do not pose a threat to the environment under natural conditions. Where vegetation is disturbed due to overgrazing, agricultural activities, general mismanagement etc., these species can quickly spread, forming dense stands that replace other indigenous species.

Selecting an alternative

In general the different vegetation types should not experience a permanent or long term negative impact if all mitigation measures are applied. Based on an ecological perspective (in sequence of preference) Alternative Corridors 3 and 1 would be preferred from Ulco to Olien, while Alternative Corridors 1 or 2 would be preferred from Olien to Manganore. These two routes will have the least ecological influence and are generally already influenced by roads, current power lines and other human influences. Alternative Route 2a (as per the map resulting from the Scoping Phase attached as Appendix A4) from Olien to Manganore would pass too close to Unit 6 (wetland/pan system) and it is recommended that it is not considered.

Conclusion

The purpose of any ecological assessment is to determine areas of high sensitivity and to provide guidelines to ensure that the proposed development is ecologically sensitive and to prevent unnecessary destruction of natural ecosystems. It is mostly unavoidable to prevent all development especially power lines to cross and affect sensitive areas. It is therefore important that all possibilities for such power lines are investigated in

order to provide ecologically sound recommendations on routes to be followed.

Most of the land is used for agriculture and grazing by domestic stock with free roaming game. All of the Vegetation Units have been evaluated in terms of the indigenous, alien and threatened (protected, red data etc.) plant species present as well as the total ecosystem and its vegetation ecological functioning. Units 4 and 5 were found to have medium conservation values and sensitivity to disturbance. Unit 4 is mostly natural and has a large number of the declining red data tree *Vachellia erioloba* present. Unit 5 has a completely different species composition and structure than that which occurs in the region with smaller microhabitats presented by the tree clumps and calcrete outcrops. Unit 6 has no sensitive species, though being classified as a wetland this ecosystem is sensitive to disturbance. All the other units were found to have a low-medium conservation value and low-medium sensitivity to disturbance. It is recommended that no pylons are placed within the wetland area while the bush clumps and calcrete outcrops of Unit 5 should be avoided as far as possible. It is important that the tree *Vachellia erioloba* is not removed unnecessarily.

The impact on habitat fragmentation would be low and could be mitigated. All other impacts were found to be acceptable after mitigation.

None of the impacts assessed for the different vegetation units will have a high negative effect on the environment and no unit was found to be highly sensitive to development.

4.1.5 FAUNA

A *Vegetation and Faunal Scoping Report* was undertaken by EnviroGuard Ecological Services CC and is attached in Appendix D(1). A summary of the relevant sections is provided below.

Nama-Karoo and Succulent Karoo, now almost devoid of large wild ungulates, holds some 10 million Sheep (*Ovis aries*) and Goats (*Capra hircus*). The once plentiful and diverse set of nomadic herbivores has been replaced by large encamped herds of small livestock with specialist feeding habits. Nearly 200 years of this treatment has had a devastating effect on the Karoo soils and vegetation. Prolonged heavy grazing is considered to suppress shoot/root formation and flowering in the Nama-Karoo and Succulent-Karoo flora, which leads to compositional changes and depletion and thinning out of the vegetation, particularly those components that the sheep find palatable. Changes in the structure and composition of the vegetation affect the associated fauna. Thinning of the already sparse vegetation layer has greatly accelerated rates of soil erosion. Although conditions have improved since the 1950's, vegetation changes in the Nama-Karoo and Succulent-Karoo are now difficult or even impossible to reverse. The changed herbivore community and the resultant impacts on the vegetation have led to lower productivity of karroid vegetation. This, in turn, is thought to have affected the food chain and ultimately reduced the density of tertiary predators, particularly mammals as well as large eagles. High livestock densities also pose considerable threat to wildlife, since high numbers of domesticated animals generally cause a displacement of game, as there is less suitable habitat available. Furthermore, wild predators and scavengers such as the Black-backed Jackal, Caracal, Leopard and the Cape vulture have been eradicated by livestock farmers who see these animals as a threat to their livelihoods. Poisoned carcasses are often used for this purpose; this method is indiscriminate and therefore poses considerable threat to all predators and scavengers; especially the threatened White-backed and Lappet-faced Vultures. Poaching and illegal hunting (dogs) are further reducing the remnant faunal populations.

Mammals

The majority of larger mammal species are likely to have been eradicated or have moved away from the area, as a result of previous agricultural activities, hunting and poaching as well as severe habitat alteration and degradation. The settlements surrounding the site as well as several informal settlements and associated hunting and poaching limits the suitability of the site for larger mammal species. High levels of hunting were

noted on and surrounding the site with the use of dogs and wire snares as well as several empty shotgun cartridges. Several dog tracks were observed along the existing Eskom servitudes as well as hunting with dogs was observed during the site visit. The collection or harvesting of wood (stumps) and rock material as well as the frequent burning of the vegetation reduces available refuge habitat and exposes remaining smaller terrestrial mammals to increased predation levels. The use of wire snares for high intensity poaching activities will significantly affect remaining smaller mammal species such as rabbits and mongooses. Secondary access roads and vehicles (motor cars, motor cycles, quad bikes) which transverse the area and bisect the valley bottom wetlands increase access to the site as well as potential road fatalities. Major road networks (R31) with high vehicular traffic increase the risk of road fatalities (hedgehogs, hares) of mammals. Smaller mammal species are extremely vulnerable to feral cats and dogs.

Threatened mammal species

Due habitat transformation and destruction as well as the high level of human activity makes it unlikely that the study area comprises significant habitat for any larger threatened mammal species. These are restricted to the private game parks in the area.

The majority reptile species are sensitive to severe habitat alteration and fragmentation. Due to current agricultural activities in the area coupled with increased habitat degradation (overgrazing, soil erosion) and disturbances are all causal factors in the alteration of reptile species occurring in these areas. Limited low-lying quartzite and dolerite rock outcrops occur around the proposed alignments and provide favourable refuges for certain snake and lizard species (rupicolous species). The removal of rock material for commercial activities from the de-proclaimed Vaalbos Nature Reserve will have a high negative impact on remaining rupicolous reptile species.

The indiscriminate killing of all snake species as well as the illegal collecting of certain species for private and the commercial pet industry reduces reptile populations especially snake populations drastically. The frequent burning of the grassland vegetation on the site will have a high impact on remaining reptiles. Fires during the winter months will severely impact on the hibernating species, which are extremely sluggish. Fires during the early summer months destroy the emerging reptiles as well as refuge areas increasing predation risks.

Threatened Reptile Species

No threatened reptile species have been recorded from the Delpportshoop (Ulco), Limes Acres and Danielskuil/Postmasburg (Manganore) 2823AA, 2823AB, 2823AC, 2823BB, 2823BC, 2823BD and 2824BA quarter degree grid cells (QDGC) according to SARCA's ReptileMAP. Four endemic reptile species namely Distant's Ground Agama (*Agama aculeate distanti*), the Marico Gecko (*Pachydactylus mariquensis*), Thin-tailed Legless Skink (*Acontias gracilicauda*) and Greater Padloper (*Homopus femoralis*) have been recorded in the adjacent grid squares. The Southern African Python (*Python natalensis*), Water Monitor (*Varanus niloticus*) and Rock or White-throated Monitors (*Varanus albigularis*) are protected species.

Amphibians

Seven frog species were recorded from the seasonal and permanent (farm dams) wetland habitats around the proposed alignments including Raucous Toad (*Amietophrynus rangeri*), Drakensberg River Frog (*Amietia quecketii*), Cape River Frog (*Amietia fuscigicula*), Bubbling Kassina (*Kassina senegalensis*), Tremelo Sand Frog (*Tomopterna cryptotis*), Natal Sand Frog (*Tomopterna natalensis*) and Common Platanna (*Xenopus laevis*). All frog species recorded are common and widespread.

The Giant Bullfrog is currently assigned as a near-threatened species (IUCN Red List category). Giant Bullfrogs have been recorded from the Kimberly area and adjacent grid squares during previous surveys as well as during the South African Frog Atlas Project (SAFAP). It is however highly unlikely that the proposed alternative power line alignments will have a significant impact on remaining bullfrog populations if the proposed tower positions are placed away from the any seasonal wetland habitats (especially seasonally inundated pans/grassland). No Giant Bullfrogs must be captured on disturbed during the construction phase.

Selecting an alternative

Alternative Route 2a (as per the map resulting from the Scoping Phase attached as Appendix A4) from Olien to Manganore is in close proximity to a sensitive wetland/pan system and is the least preferred from an amphibian perspective.

Conclusion of fauna

Development within the Route One Corridor (Preferred) can be supported, should all mitigation measures be applied.

4.1.6 AVI-FAUNA

A *Bird Impact Report* was undertaken by Mr Chris van Rooyen and Mr Albert Froneman and is attached in Appendix D(2). A summary thereof is provided below.

Important Bird Areas

The Ulco substation is situated approximately 27km south of an Important Bird Area (IBA), namely SA028 (Spitskop Dam), but the IBA is not expected to be impacted directly by the proposed project. The closest vulture breeding areas are situated about 50km away towards Kimberley.

Description of bird habitat classes

Savanna

The study area is situated in savanna, consisting primarily of Schmidtsdrif Thornveld (east of Ulco), Ghaap Plateau Vaalbosveld (between Ulco and Olien), and a mixture of Kuruman Mountain Bushveld, Kuruman Thornveld and Olifantshoek Plains Thornveld (between Olien and Manganore). Just west of Ulco Substation, the Ghaap Plateau starts with its distinctive Ghaap Plateau Vaalbosveld, which consists of a well-developed shrub layer of *Tarchonanthus camphoratus* with very few trees. Kuruman Mountain Bushveld occurs west of Olien substation on rolling hills with generally gentle to moderate slopes and hill pediments with an open shrubveld with *Lebeckia macrantha* prominent in places, and a well-developed grass layer. Kuruman Thornveld occurs on flat, rocky plains and some sloping hills with very well-developed, closed shrub layer and well-developed open tree stratum consisting of *Acacia erioloba*. Olifantshoek Plains Thornveld consists of open tree and shrub layers with a sparse grass layer. In the extreme east of the study area, Schmidtsdrif Thornveld occurs mostly between Delportshoop and Ulco and is a closed shrubby thornveld dominated by *Acacia mellifera* and *Acacia tortillis*. Apart from grasses, bulbous and annual herbaceous plant species are also prominent. The vegetation is sometimes very disturbed due to overgrazing by goats and other browsers.

The power line sensitive Red Data avifauna occurring in this habitat is typically arid woodland species i.e. White-backed Vulture, Tawny Eagle, Martial Eagle, Lanner Falcon, Verreaux's Eagle (ridges and koppies), Secretarybird and Kori Bustard.

Pans

An important feature of the arid landscape where the proposed power line is located is the presence of pans, particularly on the Ghaap Plateau. Pans are endorheic wetlands having closed drainage systems; water usually flows in from small catchments but with no outflow from the pan basins themselves. They are characteristic of poorly drained, relatively flat and dry regions. Water loss is mainly through evaporation, sometimes resulting in saline conditions, especially in the most arid regions. When flooded, the water depth is shallow (<3m), and flooding characteristically ephemeral. When flooded, pans are important for a variety of power line sensitive Red Data species which potentially occur in the study area e.g. Black Stork, Blue Crane, Greater Flamingo, Lesser Flamingo, Abdim's Stork and Maccoa Duck. Flooded pans are also used by raptors and vultures for drinking and bathing. When dry, the pans are usually covered in short grass often dominated by *Sporobolus* species, with a mixture of dwarf shrubs. Species that may seek out dry pans are Double-

banded Courser, Burchell's Courser, Ludwig's Bustard, Kori Bustard, Secretarybird and Blue Crane. The most significant pans in the study area are the Great Pan and Rooipan north-east and east of Lime Acres.

Rivers

The study area contains no major rivers, the Vaal River just skirts the study area east of Ulco substation. The study area does contain several ephemeral drainage lines, the largest being the Klein-Rietrivier and Steenbokrivier. After rains, when large pools form in the ephemeral river channels, they are important for a variety of waterbirds, including Red Data Black Stork, while Abdim's Stork are attracted to the grass-covered river channels and adjacent floodplain areas. The grassy river channels are also attractive to Ludwig's Bustards and Secretarybirds.

Agricultural lands

The study area contains a small section of irrigated agricultural lands in the extreme eastern section, along the Vaal River. Although agricultural lands completely destroy the structure of the original vegetation, some birds do benefit from this transformation. Abdim's Stork, Blue Crane and Ludwig's Bustard (to a lesser extent) are the Red Data species most likely to utilise agricultural lands in the study area. Abdim's Stork can occur in flocks of several hundred on irrigated fields.

Cliffs and ridges

In places the proposed alignments do cross steep terrain, specifically near Ulco substation, at the edge of the Ghaap Plateau, which consists of a series of low cliffs. These cliffs are potentially suitable roosting and breeding habitat for a number of Red Data power line sensitive species, e.g. Black Stork, Lanner Falcon, and Verreaux's Eagle. In the west of the study area, near Manganore Substation, the Klipfontein Hills and a couple of isolated inselbergs also provide suitable habitat for the aforementioned species.

Red data species

A total of 14 Red Data species have been recorded by SABAP2 in the QDGCs that are bisected by the various corridors. An additional species, the Kori Bustard *Ardeotis kori* almost certainly also occur in the study area. For each species, the potential for occurring in a specific habitat class was indicated, as well as the potential impact most likely associated with this specific species – refer to the table on page 15 of the Bird Impact Report as attached in Appendix D2.

Potential impacts

Electrocutions

Due to the large size of the clearances on overhead lines of 400kV, electrocutions are ruled out as even the largest birds cannot physically bridge the gap between energised and/or energised and earthed components. The risk of electrocution posed to Red Data species by the new power line infrastructure is likely to be negligible.

Collisions

The most likely potential candidates for collision mortality on the proposed power line are Kori Bustard, Greater Flamingo, Lesser Flamingo, Secretarybird, Abdim's Stork, White-backed Vulture, Black Stork, Verreaux's Eagle, Martial Eagle and Blue Crane. Ludwig's Bustard will also be at risk, based on the species flight characteristics and tendency to fly long distances between foraging and roosting areas and when migrating. The proposed corridors are all situated in the savanna biome, which is not the ideal habitat for the species. The highest risk for Ludwig's Bustard is likely to be at dry riverbeds and dry pans. Flamingos and Maccoca Ducks might be at risk near water bodies, particularly large pans when flooded. Kori Bustards might be at risk anywhere in the savanna habitat, particularly when flying to roost sites in the late afternoon and early evening. Secretarybirds will be most at risk in areas of open woodland with a prominent grass layer, and when descending to pans to drink, and in dry riverbeds and dry pans. Abdim's Stork will be at risk at flooded pans, where they often roost in large numbers, in irrigated areas, where they forage in large numbers, and in river

floodplains and dry pans. White-backed Vultures are at risk when descending to waterbodies to drink and bath or to carcasses. Black Stork will be at risk in river beds and pans. Black Stork, Lanner Falcon and Verreaux's Eagle will be most at risk where the proposed lines cross the low cliffs at the edge of the Ghaap Plateau. Tawny Eagle and Martial Eagle might be at risk anywhere in savanna habitat, but particularly when coming down and leaving from pans when visiting to drink and bath. Burchell's Courser, Lanner Falcon and Double-banded Courser are also potentially at risk of collisions, but less so than the larger species as they are more agile and therefore less likely to collide with the earthwires of the proposed lines. The coursers are also not likely to regularly fly at power line heights.

Displacement and habitat destruction and disturbance

During the construction phase and maintenance of power lines and substations, some habitat destruction and transformation inevitably takes place. This happens with the construction of access roads, the clearing of servitudes and the levelling of substation yards. Servitudes have to be cleared of excess vegetation at regular intervals in order to allow access to the line for maintenance, to prevent vegetation from intruding into the legally prescribed clearance gap between the ground and the conductors and to minimise the risk of fire under the line, which can result in electrical flashovers. These activities have an impact on birds breeding, foraging and roosting in or in close proximity of the servitude through transformation of habitat, which could result in temporary or permanent displacement. In the present instance, the risk of displacement of Red Data species due to habitat destruction is likely to be fairly limited, given the nature of the habitat.

Apart from direct habitat destruction, the above mentioned construction and maintenance activities also impact on birds through disturbance; this could lead to breeding failure if the disturbance happens during a critical part of the breeding cycle. Construction activities in close proximity could be a source of disturbance and could lead to temporary breeding failure or even permanent abandonment of nests. This is a particular concern where the proposed line crosses the edge of the Ghaap Plateau, as there might potentially be breeding Verreaux's Eagle on the low cliffs along the edge of the plateau.

Selection of a preferred alternative

On the Ulco-Olien corridors, Alternative Two Route Corridor emerged with the highest risk score (approximately 30 % higher than the other two corridor alternatives), while the other two route corridors received almost identical risk scores. In the case of Olien – Manganore, Route Two Corridor (Alternative) emerged with the highest risk score. The Route One Corridor as proposed in the EIR route alignments emerged as the combination with the lowest risk score and is the preferred route alignment from an avifauna perspective.

Mitigation

It is not the objective of this report to attempt to demarcate all sections of power line for all the alternative corridors that would need to be mitigated for potential collisions or disturbance of Red Data breeding species. This can only be done once the final alignments have been selected and tower positions have been finalised. At this stage, the following recommendations are put forward from a potential bird impact perspective:

- The Route One Corridor (Preferred) was assessed to be the corridor with the lowest risk to birds. It is therefore recommended that these alternatives are used.
- Once the final alignments and tower positions have been selected, the sections of the line that would need the application of Bird Flight Diverters to mitigate for potential collisions should be indicated by the avifaunal specialist by means of a "walk-through" exercise. This exercise should be informed by an analysis of satellite imagery supplemented by on site ground-truthing (physical inspection). The type of Bird Flight Diverter to be used and the marking scheme will be determined during that phase of the project.
- The Eskom standard procedure with regard to the clearing of vegetation must be strictly adhered to, to minimise the extent of habitat destruction and disturbance during the construction phase. Existing roads should be used as far as possible to prevent further habitat fragmentation through the construction of new access roads, and to limit the construction footprint.

4.2 CULTURAL/HISTORICAL ENVIRONMENT

4.2.1 PALAEOLOGY

A *Palaeontological Impact Assessment* was undertaken by Prof Marion Bamford and is attached in Appendix C(3). A summary thereof is provided below.

Since none of the rock formations or sediments in the region is potentially fossiliferous, being too old or too young, the project to erect power lines and substations between the Ulco, Olien and Manganore substations may continue as far as the palaeontology is concerned. If however, any fossils are discovered during the excavations then it is strongly recommended that the fossils are rescued and a palaeontologist is called to assess their importance and make further recommendations.

No phase 2 palaeontological impact assessment is required.

4.2.2 ARCHAEOLOGY & CULTURAL HERITAGE

A *Heritage Impact Report* was undertaken by Archætnos Culture & Cultural Resource Consultants and is attached in Appendix D(4). A summary thereof is provided below.

One site of cultural heritage significance was found within the Route One Corridor (Preferred) on the section between the Ulco-Olien substations. However, it would be easy to avoid the site. No further action is necessary with regards to the site identified as long as the development stays at least 20m from it.

There is no specific preference for any of the route alternatives. Areas to be avoided would be high-lying areas such as hills or mountains, but very few of these were encountered during the survey. None of the alternatives routes are within a 10km radius of a world heritage site.

It should be noted that due to the nature of the subterranean presence of archaeological and/or historical sites, features or artifacts, the possibility to find these during the course of construction work are always real. Care should therefore be taken, when development work commences, that if any of these are accidentally discovered, a qualified archaeologist be called in to investigate. The results of such an investigation should be submitted to SAHRA and the recommended mitigation measures should be included in the Environmental Management Plan.

By not placing the pylon positions on sites of significance, no further action will be necessary as these sites may be over-spanned. The only exception is graves which may not be over-spanned and for which a 20m buffer zone is recommended. A final walk-down, to inspect pylon positions, is therefore recommended.

The proposed development may therefore continue as long as the above mentioned recommendations are adhered to.

4.3 SOCIO-ECONOMIC, TOURISM AND LAND USE

A *Socio-Economic, Tourism and Land Use Potential Impact Report* was undertaken by AMP Property Management and Land Acquisition and is attached in Appendix D(6). A summary of the relevant sections is provided below.

4.3.1 LANDUSE

Game Farms and Nature Reserves

Several game farms are located in the area of study; most of which cater for international hunters.

Mining

- *Idwala mine*: This mine is on Ouplaas on the southern side Danielskuil in the NCP. The mine may be affected by alternative 1 of the Olien to Manganore power line corridor. Production started in 1975 and the mining of high grade limestone, crushing, screening and milling take place at this operation.
- *Finch mine*: falls within the corridor of alternative 2 of the Olien to Manganore power line. According to Mining Atlas “the mine has been on care and maintenance for some time” and its status is suspended. InfoMine states that on the 25th of January 2008 there was reported that the reason for the suspension had been that the electricity supply in the Northern Cape Province was increasingly unreliable, which impeded the mine progress.
- *Ulco*: is one of the largest cement mines and factories in the Southern Hemisphere. It is operated by Afrisam, who has made great leaps in running an environmentally friendly plant.

Agriculture

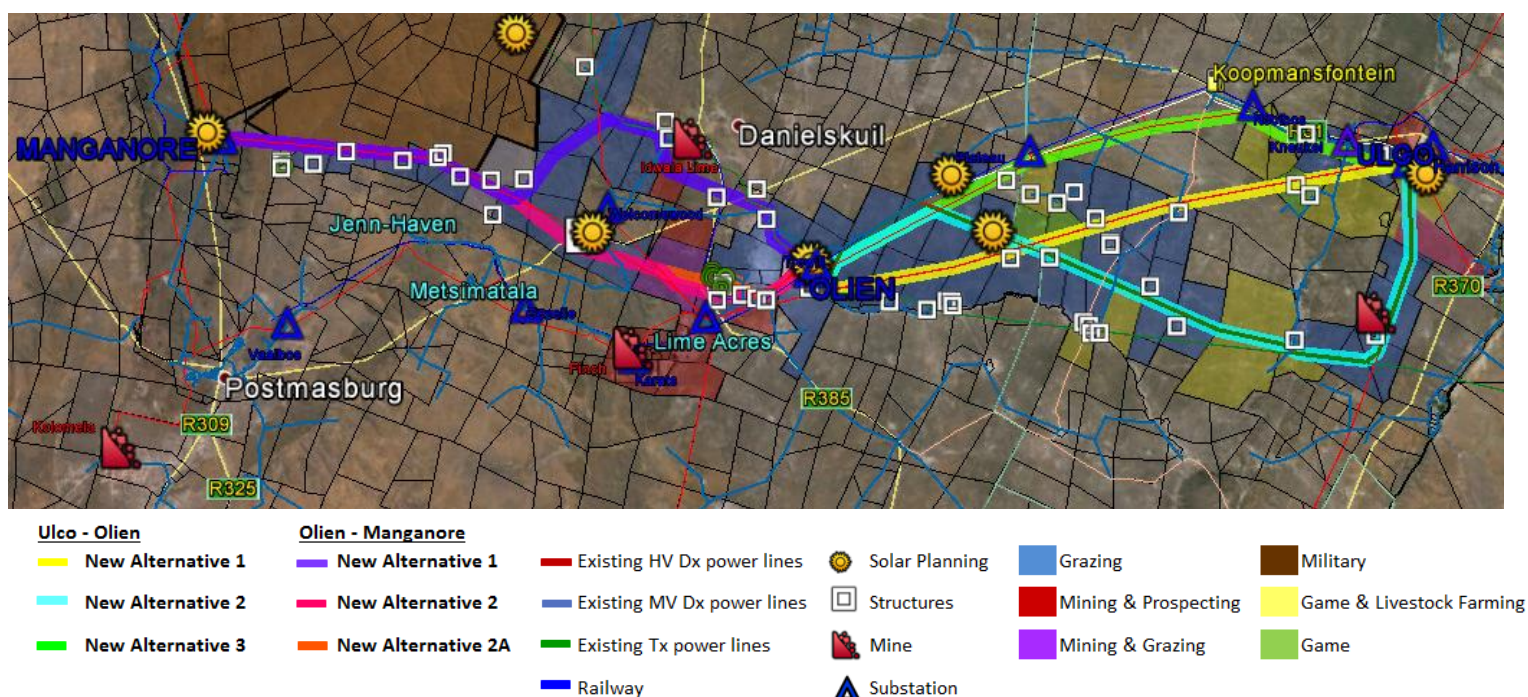
Agricultural activities mostly consist out of game and livestock farming. There are a few areas with arable lands most of which are irrigated.

Solar Energy Facilities

According to Savannah Environmental (Pty) Ltd and other I & AP's, EIA's are being conducted for Solar Energy Facilities on the following properties: Plaas 217; Plaas 267; Grootvlei 296; Plaas 300 and Kapstewel 436.

Land Use Summary

Currently the most of the farms in the area of study is used for grazing of livestock and/or game. There are several mines especially in the lime and diamond sector.



4.3.2 SOCIO-ECONOMY AND TOURISM

A *Socio-Economic, Tourism and Land Use Potential Impact Report* was undertaken by AMP Property Management and Land Acquisition and is attached in Appendix C(1). A summary of the relevant sections is provided below.

Social Change Processes

The purpose of this section is to describe the social processes that this proposed Eskom project will entail. It is important to understand that social and economic change processes can evolve to relevant impacts. The following processes are predicted in the different phases of the project:

- *Demographic Processes*

In small communities the movement of people looking for new opportunities is more visible. This may happen during the construction phase, where people of other areas will be looking for jobs. However job opportunities during the construction phase will be very limited since most contractors do not use many unskilled labourers. In the operational phase the greater electricity capacity may indirectly attract development of industries which may offer new work opportunities.

- *Economic Processes*

Macro-economic factors as well as the way that people make a living in the area will have an effect on the economic processes. There may be a possibility for a small amount of temporary jobs for unskilled workers during the construction phase, but the operational phase will be performed by Eskom employees.

- *Geographic Processes*

These processes affect the land-use patterns of the community. Most of the land is grazing for game and livestock, but there are areas with irrigated lands and pivots. There will be a time period during construction when the farms will be encroached upon, should there be structures on the properties. During the design phase, pylon placing will be done in a manner that has minimum encroachment on the property and is most economically sustainable.

In the case of game farms the power line will not only impact the farms in terms of aesthetics but may also be a danger and inconvenience with regards to helicopters, which play a significant role in game farming in terms of game counting, capture and darting.

- *Institutional and Legal Processes*

These processes affect the efficiency of organisations, which include government and non-government agencies, as well as the commercial sector that is responsible for the supply of the services that the people depend on. The power line will not have a great effect on these processes with regards to normal livestock and agricultural farming. The negative aesthetic value associated with power lines is found to be a major concern for game farmers, since they are often involved with international investors who may be discouraged from the area.

- *Emancipatory and Empowerment Processes*

Emancipatory and empowerment processes lead to the ability of the local community to participate in the decisions that will have an effect on their lives. The proposed power line will not have a direct benefit for the local people, since it will be between two substations, the influence is therefore of an indirect nature since the substations will feed the local electricity network with a better quality supply. Therefore it will be applicable in the operational phase. As discussed above it will provide the possibility for economic growth in the area.

- *Socio-Cultural Processes*

The aspects in the culture and the way people live together are applicable in this section. During construction there may be an influx of people from other areas mainly for labour purposes.

Social Impact Assessment Categories

- *Health and Social Wellbeing*
 - Future aspirations – Economic growth regarding farming, tourism and mining activities.
 - Feeling in relation to project – great sense of fear and resistance was experienced initially, but with consultation and explanation it changed positive regarding many private land owners. It was established to rather work together in planning an environmentally acceptable route than to force a route on the land owners. Special consideration needs to be taken into account where crossing over game farms.

- *Quality of living environment*
 - Quality of physical environment - There will be exposure to minimum dust and noise of vehicles in the construction phase. Construction workers will be fitted with PPE and be in the possession of identification when in the construction area.
 - Aesthetic Quality- The visual impact of the structures was addressed.
 - Adequacy of physical infrastructure. The route next to the existing roads as well as sections next to existing power lines will be preferred to minimise additional impacts. Gates should be closed at all times.
 - Personal safety and risk exposure. This is a high risk to property owners. No unauthorised entrance will be acceptable. Staying on next to existing roads where possible will be more acceptable – not accessing the total farm. No fires on construction sites.
 - Crime and violence. Eskom and the contractors are not welcome due to the perception that livestock thefts can increase.
 - Fire risk prevention. Eskom Transmission implemented the AFIS system where three satellites monitor (two of which are MODIS by NASA) which together track fires. The system updates every 15 minutes and fires as small as 0.25ha can be picked up. If these fires come within 2.5km from transmission power lines, warnings are sent via text messages to relevant Eskom employees mobile phones. Where possible national control can temporarily isolate the circuit under threat. Fire suppression teams are sent out where available.
 - Eskom registers servitudes for power lines. This means that the property still belongs to the relevant land owner, and Eskom owns the right to have a power line over the property. Since the property still belongs to the land owner, it is still the responsibility of the land owner. Eskom does however do maintenance of the vegetation under the power lines to decrease the fire risk under the lines.

- *Economic impacts and material wellbeing*
 - Property values. There may be a negative effect on the property values pending on the utilisation of the land. The influence will be taken into consideration during the valuation process where a valuation is to be done and land owners is to receive market value compensation.
 - Employment. Only limited unskilled work opportunities may be available to local communities.
 - Replacement costs of environmental functions. Land owners will be able to continue farming activities.
 - Structure planning must be liaised with land owners in cultivated fields.

- *Cultural impacts*
 - Loss of natural and cultural heritage. Refer to relevant report.

- *Family and Community impacts*
 - Social networks. The proposed route is mostly over game and agricultural farm land and a good neighbouring relationship exists.
 - Community connections. Social network exist in the community where a group will support each other. This is essential in the form of farmers associations. The relevant associations in the area have been informed about the proposed project and is considered part of the I&AP's.

- *Institutional, legal, political and equity impacts*
 - Impact equity. There should be a fair distribution of the impacts across the community. This project will ensure a better supply of electricity and fewer interruptions to all.
 - Other institutions that will also possibly be affected are state owned organisations like SANRAL, Transnet as well as the relevant municipalities and provinces.
- *Gender relations*
 - Gender division of labour. According to Statistics South Africa TLM have a greater than 50,3% female population. There are normally not woman employed as unskilled labour for the construction of power lines.

Conclusion

The socially preferred route will have the minimum impact on individual properties. There are several game farms in the area west of the Ulco Substation and towards the Olien Substation. The power line may have an impact on the aesthetic value of these properties and should be considered. In the area of the Olien and Manganore Substations, there is a greater amount of mining areas. It is essential that future mining plans be considered in order to construct the power line in a long term sustainable route, and avoid future deviations.

Considering the information available from research conducted through desktop studies, site visits and consultation with Eskom, land owners and other relevant individuals it became apparent that new alternative corridors need to be considered for the proposed power line.

The route corridors as presented in Paragraph 3.4 and the map as attached in Appendix A(3) is a result of, amongst other, these studies.

4.3.3 SOILS & AGRICULTURAL POTENTIAL

An *Soil and Agricultural Potential Baseline Study* was undertaken by TerraAfrica Consults and is attached in Appendix C(3). A summary thereof is provided below.

Land Types

The following land types were identified within the macro study area:

- *Land Type Ae2*

The land type is found in landscapes where the slope is between 1% and 6% and slope length between 800 and 4000 m for Landscape Position 4 and slope of 0 to 2% and slope length between 5 and 1000 meters for Landscape Position 5. The soil forms in this land type mainly consist of deep to medium-deep red apedal soils of the Hutton form with patches of yellow-brown apedal Clovelly soils and shallow, rocky Mispah soils dispersed in between. According to the land type chart these soils are underlain by banded ironstone and jaspillite with subordinate amphibolite and crocidolite (Asbestos Hills Formation) and fine and coarse-grained dolomite, chert and dolomitic limestone (Ghaap Plateau Formation).

- *Land Type Ae214*

This land type is found in four different landscape positions where Positions 1 and 3 are associated with areas with hilltops and steeper slopes of between 0 and 8% and slope lengths of 100 to 500m and 500m to 2000m. For the flatter landscape positions, the slope is between 0 and 2% and slope length between 50 and 1000 m for Landscape Position 4 and slope of 0 to 2% and slope length between 50 and 200 meters for Landscape Position 5. The soil forms in this land type are dominated by red apedal Hutton soils with varying depth. The geology underlying this land type is amygdaloidal andesitic lava with interbedded tuff, agglomerate, chert and red jasper.

- *Land Type Ae215*

This land type is associated with very shallow valley bottoms with only two landscape positions. Both of these positions (4 and 5) have very little slope (0 – 2 %) and long slope lengths. This land type is also dominated by soils of the red Hutton form but also included wetter soil of the Kroonstad form.

- *Land Type Ae216*

This land type is very similar to land type Ae216 in that is associated with very shallow valley bottoms with only two landscape positions. Both of these positions (4 and 5) have very little slope (0 – 2 %) and long slope lengths. This land type is also dominated by soils of the red Hutton form and also includes soil of the Valsrivier form and stream beds. The geology underlying is land type is amygdaloidal andesitic lava with interbeds of tuff, agglomerate, chert and red jasper of the Ongeluk Formation.

- *Land Type Ah21*

The land type represents areas where duplex soils with non-red B horizons comprise more than half of the area covered by it and where the slopes are relatively flat. The soils are dominantly shallow to deep structure duplex with a limited occurrence of swelling soils in depressions. According to this classification, the land capability and land use is predominantly extensive grazing due to climatic and soil constraints. Due to the level terrain soil erosion is not a major factor but the duplex soils are very susceptible to such if the terrain is physically disturbed. The site also falls into an area with low potential due to relatively low and erratic rainfall

- *Land Type Dc5*

Land type Dc5 consist of a combination of duplex soils where clay accumulation through the soil profiles have resulted in more structured soil forms such as that of the Valsrivier, Swartland and Oakleaf forms. It is found in flatter landscape positions with long slope lengths.

Soil classification

Five different main soil groups are present in the entire Ulco-Olien-Manganore baseline area as well as in the areas currently indicated as the proposed alternative corridors for the project. Below follows a description of each of the groups:

- *Lithic soils (Group 2)*

This group include shallow, rocky soils that are considered rather young in pedogenesis (soil formation processes). The lithic group is dominated by soils of the Mispah and Glenrosa forms and also include rocky outcrops (in this area more specifically dolerite outcrops). These soils have sandy texture, while topsoil structure is apedal and the profiles are very shallow (as shallow as 0.10 m of soil on a rocky layer). The orthic A-horizon of the lithic soil group is unsuitable for annual cropping or forage plants (poor rooting medium since the low total available moisture causes the soil to be drought prone). This soil group covers the smallest area of the three groups within the study area and is limited to the south-western part of the study site. Only alternative three has 4.2 kilometres of the proposed corridor that falls within the lithic soils.

The pans identified on site are endorheic pans that formed as a result of low infiltration rate of the soils present on site. These pans are underlain by rock and hardpan carbonate horizons where water accumulates during thunderstorms during the summer months. The water in the pans remains present until the high evaporation rate resulted in all the water evaporating. This leaves the soil surface barren and the lack vegetation on the soil surface cause sand to erode away as a result of wind erosion. The rock and/or carbonate horizon does not function as a conventional wetland and therefore the soils present in the pans are not considered sensitive. Sensitivity of these pans is more related to the ecosystems that are supported by the temporary water supply in the summer months.

- *Oxidic soils (Groups 1, 2 and 3)*

The soil group consists of an orthic A horizon on a red or yellow-brown apedal B horizon overlying unspecified material. The B1-horizon has more or less uniform "red" or "yellow" soil colours in both the moist and dry

states and has weak structure or is structureless in the moist state. The red and yellow apedal horizons are per definition non-calcareous within 1500mm of the soil surface, but may contain small lime nodules as was the case on site. Textures are coarse to medium sand to sandy-loam in the topsoil and medium to fine sandy-loam in the subsoil. Structure is weak blocky (dominant) or apedal in all horizons. These red-yellow apedal soils dominate the western half of the entire study area. The clay content for this soil group is less than 15%.

- *Prismacutanic and/or pedocutanic soils (Group 1)*

Prismacutanic and/or pedocutanic soils have strong B horizon structure and a marked increase in clay content down the soil profile, compared to the overlying horizon, from which it is separated by a clear or abrupt boundary. This clear change between adjacent horizons has resulted in the term “duplex soils” being given to this group. The soils have high erosion susceptibility and the B horizon is often sufficiently hard to be an impediment to both root growth and water movement.

The marked enrichment with clay in the subsoil results in strong blocky structure and cutanic character (clay skins). The cutans give the peds shiny surfaces that reflect the light and are often a different colour to the interior of the peds. The orthic A horizon often has a weak structure and when it contains sufficient clay it may become hard or very hard when dry (a feature known as ‘hard-setting’).

Amounts of organic matter are low giving their (orthic) top soils a grey or brown colour. Base status varies from low to high, a range directly correlated to the amount of clay in either the overlying horizon or the B horizon itself. The soils have a low phosphate (P) fixing ability and often have moderate reserves of plant nutrients. Prismacutanic and/or pedocutanic soils dominate the eastern half of the site and the clay content ranges between 15% and 35%. All three corridor alternatives occur within this soil grouping.

Soil Depth

The Environmental Potential Atlas indicated that soil depths in the study area are divided into two groups i.e. soils shallower than 450mm and soils between 450 and 750mm (Figure 13). Deeper soils are present on the eastern portion of the study area and are associated with the pedocutanic and prismacutanic soil forms. The shallower soils are present on the western part of the side and are found in the areas associated with the oxidic soils as well as the lithic soil group.

Agricultural Potential

The dominant land-use in the larger study area prior is cattle and small livestock farming. This included the commercial farming of cattle, goats and sheep. The average carrying capacity of the veldt is 14 ha per unit of large stock. Game farming is also present in the study area. This region is not suited to the production of dryland arable agricultural owing to the low rainfall. Irrigated crop production is practiced in very small areas that are limited by the availability of irrigation water and proximity to the water resource.

According to the ENPAT data, the western portion of the study area is dominated by land with no or very low arable agricultural potential due to the shallow nature of the topsoil present. The eastern portion is considered to have intermediate suitability as a result of the deeper soil profiles however the climate only permits successful production in the presence of irrigation systems as a result of the erratic rainfall and high evaporation rate that results in soilwater losses.

Conclusion

Based on the baseline soil and agricultural potential data gathered for this study, it is the opinion of the soil scientist, from a soil conservation and land capability point of view, that the first alternative for the proposed development be considered favourably. Although the first alternative has a longer footprint than all other alternatives considered, it will avoid cutting through areas with endorheic pans that may have ecological value. However, it is not anticipated that the first alternative will have any detrimental impact on the crop production ability of the region or result in soil degradation. It is still important that due care is taken to minimise impacts on soils and land capability through good soil management principles.

4.3.4 VISUAL COMPONENT

A *Visual Impact Assessment Scoping Report* was undertaken by Newtown Landscape Architects and is attached in Appendix D(5). A summary thereof is provided below.

Study area

For the purposes of the visual specialist report the study area is defined as 3km beyond the proposed corridors. Beyond 3km the power line would tend to become part of background and will not have a major impact on views.

Visual Resource

- *Value of the Visual Resource / Scenic Quality*

High Escarpment and hills west of Danielskuil = moderate to high	Moderate Rolling plains with savannah and grassland – mostly game and cattle grazing	Low Power infrastructure and mining areas
This landscape type is considered to have a high value because it is: A distinct landscape that exhibits a very positive character with valued features that combine to give the experience of unity, richness and harmony. It is a landscape that may be considered to be of particular importance to conserve and which has a strong sense of place. Sensitivity: It is sensitive to change in general and will be detrimentally affected if change is inappropriately dealt with.	This landscape type is considered to have a moderate value because it is: A common landscape that exhibits some positive character but which has evidence of alteration /degradation/erosion of features resulting in areas of more mixed character. Sensitivity: It is potentially sensitive to change in general and change may be detrimental if inappropriately dealt with.	This landscape type is considered to have a low value because it is: A minimal landscape generally negative in character with few, if any, valued features. Sensitivity: Generally not sensitive to change

- *Sense of Place*

The study area's sense of place derives from the combination of all landscape types described above and their impact on the senses. The open, gently rolling bushveld, in the eastern and central sections of the study area east of Olien give these areas a relatively strong positive sense of place due to the openness and panorama views that the visitor experiences against the backdrop of a huge sky. Some of these areas are however compromised with the presence of transmission and distribution power lines that cross the study area.

The western section of the study area, associated with the hills east of Danielskuil and with the series of hills that run north of the Manganore substation also project a strong sense of place that create a greater visual interest and thus a more positive, memorable landscape, within the context of the region. The landscape type associated with the mining activities also projects a strong sense of place but from a negative perspective.

Visual Receptors

- *Views*

Public views of the study area originate along the main public roads and district farm roads. The R31 runs east west from Ulco to Danielskuil and is north of the Ulco – Olien section of the Project. The other main tarred road, R385 runs from south of Olien, meets with the R31 just south of Danielskuil and then moves west to Postmansburg. It passes through both alternative corridors of the Olien – Manganore section of the study area. The R325 that links Postmansburg to Sishen, runs immediately west of the study area and the Manganore substation. A number of gravel farm roads cross the various corridors in a north south orientation.

Private views, from residences, originate mostly from the farmsteads scattered about the site. However, due to the flat nature of the landscape many views from these private vantage points would be blocked by the bushveld vegetation, specifically in the eastern sector of the study area. On the other hand private views in the hilly terrain west of Danielskuil would be more open (less bushveld trees and shrubs) but would for the most part be blocked due to the undulating nature of the terrain.

- *Sensitive Viewers and Sensitive Viewer Locations*

<p style="text-align: center;">High Residential / Farmsteads</p>	<p style="text-align: center;">Moderate Public roads R31, R385, R325 and local district roads</p>	<p style="text-align: center;">Low Central sections of the study area between Lime Acres and Danielskuil (mining areas) and at Ulco and Olien substations</p>
<p>Communities where the development results in changes in the landscape setting or valued views enjoyed by the community; Occupiers of residential properties with views affected by the development.</p>	<p>People travelling through or past the affected landscape</p>	<p>Visitors and people working within the study area and travelling along local roads whose attention may be focused on their work or activity and who therefore may be potentially less susceptible to changes in the view. Or the character of the landscape in this area has been severely compromised.</p>

Comparison of Alternative Corridors

Ulco to Olien

The result of the comparison for the Ulco – Olien section, is that the three alternatives have similar conflict ‘scores’. However, Alternative Three has the least number of potential conflicts, namely 19. Alternative One has 20 conflicts and Alternative Two, 21.

The potential visual impact of the proposed alternatives would be the following:

Alternative One and Three route corridors

Potential impact is high, but spatially concentrated i.e. spatially affecting less visual environment and thus in the broader scale less visually intrusive. These options are acceptable within the context of the study area as the impact is contained and has been rerouted to avoid major conflicts with sensitive land uses. However, the potential impact of two lines of differing type traversing the landscape would be high at highly sensitive landscape areas and viewing locations resulting in an ‘industrial’ aesthetic which may not be acceptable to sensitive visual receptors.

Alternative two route corridor

Potential impact is high, but spatially less concentrated as approximately half of the proposed corridor is aligned in new land away from existing lines i.e. affecting more visual environment and thus in the broader scale more visually intrusive. This corridor option would have 21 visual conflicts.

Olien to Manganore

The result of the comparison of the alternative route alignments is that the two alternatives have similar conflict ‘scores’. Either of the Alternative two options would therefore be the preferred option for this section of the line.

The potential visual impact of the proposed alternatives would be the following:

Route One Alternative

Potential impact is high, but spatially concentrated i.e. spatially affecting less visual environment and thus in

the broader scale, within the context of the study area, less visually intrusive. These options are acceptable within the context of the study area as the impact is contained to existing corridors. However the potential impact of two lines of differing type traversing the landscape would be high at highly sensitive landscape areas (western section of the corridor) and viewing locations resulting in an 'industrial' aesthetic which may not be acceptable to sensitive visual receptors. Along these corridors there are 21 potential conflict areas.

Route Two Alternative

Potential impact is high, but spatially concentrated i.e. spatially affecting less visual environment for most of the line. However there is a section of the corridor that extends from west of Danielskuil to the meet with the 'collective' corridor, which runs through 'new' land and will broaden the scale of impact for this option and therefore be more visually intrusive. However, the potential impact of two lines of differing type traversing the landscape would be high at highly sensitive landscape areas and viewing locations (residences at Danielskuil) resulting in an 'industrial' aesthetic which may not be acceptable to sensitive visual receptors. Along this corridor there are 22 potential conflict areas.

Given these facts the preferred option from a visual impact perspective is either of the alternative two route corridors.

Substations

The impact of the new Olien substation would be the same for each route and therefore do not factor in a comparative analysis of the alternative corridors. Visually the new substation would not be intrusive as it would be contained to an adjacent footprint and therefore be absorbed into the current sub-station infrastructure.

4.4 SUMMARY OF ENVIRONMENTAL SENSITIVITY

Refer to the Environmental Sensitivity Maps included as Appendix A(6). The maps summarises the significant site sensitivities that guided the route selection. Specific mitigatory measures are proposed in the Environmental Management Plan to ensure that no unnecessary negative impact will occur on these environmental features as a result of the project.

CHAPTER 5: PUBLIC PARTICIPATION

5.1 OBJECTIVES OF THE PUBLIC PARTICIPATION PROGRAMME

The main aim of public participation is to ensure transparency throughout the EIA process. The objectives of public participation in this EIA are the following:

During the Scoping Phase

- To identify all potentially directly and indirectly affected stakeholders, government departments, municipalities, landowners;
- To communicate the proposed project in an objective manner with the aim to obtain informed input;
- To assist the Interested & Affected Parties (I&AP's) with the identification of issues of concern, and providing suggestions for enhanced benefits and alternatives;
- To obtain the local knowledge and experience of I&AP's;
- To verify that the concerns and issues raised by I&AP's define and guide the scope of further studies to be undertaken during the Impact Assessment.
- To ensure that all reasonable alternatives are identified for assessment in the EIA Phase.

During the Environmental Impact Assessment Phase

- To communicate the progress of the EIA study as well as the proceedings and findings of the specialist studies;
- To ensure that informed comment is possible;
- To ensure that all concerns, comment and objections raised are appropriately and satisfactorily documented and addressed;
- To obtain reasonable consensus with regards to the final route corridor proposed for the Eskom project.

5.2 PROCESS FOLLOWED

Significant measures were taken to ensure that all stakeholders and interested and affected parties were informed of the project and were allowed the opportunity to place their concerns and comment on record.

The Public Participation Process (PPP) followed is summarised as follows:

INITIAL / 1ST PHASE NOTIFICATION and ADVERTISING

- The PPP for this project kicked-off during January 2014.
- All potential directly and indirectly affected landowners, stakeholders and government departments were identified. The following I&AP lists were compiled (and is included in Appendix E(11) of this report):
 - List of Government Departments
 - List of Municipalities
 - List of General Stakeholders
 - List of Directly Affected Landowners
- A Background Information Document (BID) was compiled and distributed to all the stakeholders listed. The method of distribution included e-mail; fax and/or postal service. Both the BID and the proof of distribution of the BID are included in Appendix E(1).

- Eighteen onsite advertisements (in both English and Afrikaans) were placed along the three initially route corridor alternatives initially proposed. Proof of placement of these onsite advertisements are included in Appendix E(2).
- Seven newspaper advertisements were placed in the following publications Proof of placement of these onsite advertisements are included in Appendix E(3).

Regional Publications:

Kalahari Bulletin, 13 February 2014
 Free State Times, 14 February 2014
 Kathu Gazette, 15 February 2014
 Volksblad, 15 February 2014
 Diamond Fields Advertiser, 17 February 2014

National Publications:

Sunday Times, 16 February 2014
 Rapport, 16 February 2014

- Two Public Open Days were held on Wednesday 13 August 2014:
 - Formal presentation at 11h00 at the Ulco Club Circle, Ulco Golf Club, followed by a discussion period.
 - Formal presentation at 17h00 at the Papkuil Safari Lodge (close to the town of Lime Acres) followed by a discussion period.

The objectives of this Public Open Day were the following:

- To communicate the purpose and details of the proposed project;
- To present the alternative routes which are being considered and investigated;
- To present the findings of the specialist studies;
- To further enable informed comment from the public and key stakeholders;
- To provide an opportunity to address questions to a panel of specialists and/or Eskom personnel.

Comment received during the initial advertising phase as well as the public open day was addressed in the Draft Scoping Report.

Deviation requested

The following deviations from the public participation process were applied for with the Department of Environmental Affairs in terms of Regulation 54(5) of GN R. 543:

Deviation from GN R. 543 Item 54(2)(b)(ii):

The person conducting a public participation process must take into account any guidelines applicable to public participation as contemplated in section 24J of the Act and must give notice to all potential interested and affected parties of the application which is subjected to public participation by

- (b) giving written notice to—
- (ii) the occupiers of the site where the activity is or is to be undertaken or to any alternative site where the activity is to be undertaken

Deviation from GN R. 543 Item 54(2)(b)(iii)

The person conducting a public participation process must take into account any guidelines applicable to public participation as contemplated in section 24J of the Act and must give notice to all potential interested and affected parties of the application which is subjected to public participation by

- (b) giving written notice to—
- (iii) owners and occupiers of land adjacent to the site where the activity is or is to be undertaken or to any alternative site where the activity is to be undertaken;

Reason for deviation request

Three different route alternatives were identified for this powerline proposal and a total of 274km with a 2km wide corridor will be investigated.

It is not possible, nor feasible to inform all the occupiers of the land or the adjacent land of this development proposal.

Numerous steps were taken to ensure that nobody is negatively affected by the allowance of the deviation request (refer to the public participation followed as described above).

The deviation request was granted by the Department of Environmental Affairs.

DISTRIBUTION OF SCOPING REPORT

Proof of distribution is attached as Appendix E6.

- The Distribution of the Draft Scoping Report was done as follows:
 - Notification to all the listed stakeholders of the availability of the Draft Scoping Report at a public venue (Barkly West and Postmasburg public libraries) was done via email, fax and/or postal service. Where an e-mail address was available an internet link to the Draft Scoping Report was provided. A 40-day response period applied.
 - The Draft Scoping Report was linked to the SAHRIS website of the South African Heritage Resources Agency (SAHRA).
 - Hard copies of the Draft Scoping Report were hand-delivered to the following authorities;
 - **Department of Environment and Conservation, Northern Cape**
The Environmental Officer: Ms Dorien Werth
90 Lang Street, Vasco Building, Kimberley. Tel 053 807 7468
 - **Department of Water and Sanitation, Northern Cape Region**
Acting Director: Water Sector Regulation and Use: Ms Nosie Mazwi
28 Central Road; Room B 24; Beaconfield; Kimberley, 8301.
Tel 053 836 7600 / 082 802 7128
 - **Dikgatlong Local Municipality**
The Municipal Manager: Mr Robert Harold
33 Campbell Street, Barkly West. Tel 053 531 0671 / 053 531 0624
 - **Tsantsabane Local Municipality**
The Municipal Manager: Mr Mathobela
13 Springbok Street, Postmasburg. Tel: 053 313 7300 / 02 / 11
 - **Kgatelopele Local Municipality**
The Municipal Manager: Mr Morgan Motswana
Baker Street, Danielskuil, Tel: 053 384 8600

Comment received on the Draft Scoping Report was responded to in the Final Scoping Report as well as the Draft Environmental Impact Report, which was distributed for further public comment (see paragraphs below).

DISTRIBUTION OF DRAFT ENVIRONMENTAL IMPACT REPORT

Proof of distribution is attached as Appendix E9.

- The Distribution of the Draft EIR was done as follows:
 - Notification to all the listed stakeholders of the availability of the Draft EIR at a public venue (Barkly West and Postmasburg public libraries) was done via email, fax and/or postal service. Where an e-mail address was available an internet link to the Draft EIR was provided. A 40-day response period applied.

- The Final Heritage Impact Assessment Report and Final Route Map were linked to the SAHRIS website of the South African Heritage Resources Agency (SAHRA). An email was also sent to the applicable case officers informing them of the submission on SAHRIS.
- Hard copies of the Draft EIR were hand-delivered to the following authorities;
 - **Department of Environment and Conservation, Northern Cape**
The Environmental Officer: Ms Dorien Werth
90 Lang Street, Vasco Building, Kimberley. Tel 053 807 7468
 - **Department of Water and Sanitation, Northern Cape Region**
Acting Director: Water Sector Regulation and Use: Ms Nosie Mazwi
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The Municipal Manager: Mr Mathobela
13 Springbok Street, Postmasburg. Tel: 053 313 7300 / 02 / 11
 - **Kgatelopele Local Municipality**
The Municipal Manager: Mr Morgan Motswana
Baker Street, Danielskuil, Tel: 053 384 8600

Comment received on the Draft EIR is addressed in the Final EIR (this document). No comment that could change the outcome of the project was received and no substantial changes were made to the Draft EIR. No changes were made to the Preferred or Alternative Route as presented in the Draft EIR. The Final EIR is now submitted to the Department of Environmental Affairs for their perusal and ultimately, the issuing of the Environmental Authorisation.

5.3 ISSUES RAISED DURING THE SCOPING PHASE

5.3.1 WRITTEN COMMUNICATION WITH I&AP'S UP TO DISTRIBUTION OF DRAFT SCOPING REPORT

Correspondence between I&AP's and Landscape Dynamics are attached in Appendix E(4)

Please note

- *AMP Property Management & Land Acquisition (the route identification specialists on the project team) contacted the affected landowners directly to discuss issues as mentioned below. The proposed power line route corridors were adjusted in some cases to accommodate the landowners' concerns.*
- *Comment summarised below was either addressed by AMP via direct consultation with the applicable landowner or are responded to in Paragraph 5.2.2, "Main Issues Raised at the Public Open Day".*
- *The routes as proposed in the amended route map (attached in Appendix A4) could still be amended or could even result in a combination of routes, depending on the outcome of specialist investigations, further community consultation and input from the directly affected landowners.*
- *It is important to note that Eskom cannot construct any power lines without the written consent of the landowner, since a servitude has to be registered for the power line and substation.*

Requests to be registered as an IA&P / to be kept updated with the EIA process were received from:

- Johan Hattingh (on behalf of the owner of the C&S Hattingh Familie Trust)
- Nuku Manenye – SHEQ superintendent at Idwala Mine
- Mashudu Dzivhani – landowner of Carterblock 458
- Ms Kokkie York
- Mr Bart Daffue – Koopmansfontein Boerevereeniging

- Mr Terrence Govender - SolarReserve South Africa (Pty) Ltd

Mr TCB Vermeulen – owner of the Farm Engeland

The Olien Substation is on his property and no negotiations with him took place before the project was advertised in the press. Power lines and substations lower the value of property. Nobody is allowed to enter his property until negotiations took place to his satisfaction.

Mr Anton van Niekerk – owner of the Farms Chavonne 271 & Glen Allen 12

- The most southern line is not viable because of the wetlands (*this route was scrapped as an alternative*).
- One of the alternative route options crosses his property and this is not feasible since two other power lines already cuts through the property. The new line will cross close to the southern border of his property and will have a severe negative impact on farming activities (cattle).
- An acceptable route will be Alternative 1 (*as per the map attached in Appendix A3*), but on the northern side of the border of his farm.

Mr Anton van Niekerk and Mr Gerrit Nieuwoudt, owners of the farms Constancia, Vaalpan, Chavonne and Glen Allen

The following comment was also delivered to Landscape Dynamics at the public open day which was held in Ulco.

- Two power lines already cross the properties.
- The existing servitudes are not being properly maintained by Eskom (clearing of bushes) and it therefore holds a fire risk. In case of fire, the owner of the property has to fight the fires without the help or financial assistance from Eskom.
- Will Eskom give any compensation if a farm burns due to the power lines.
- Eskom workers access farms without the knowledge of the farmers and gates are being kept open with a consequent loss of game and livestock. Queries directed to Eskom are not being addressed at all and this is one of the reasons why they object to further power lines on their properties.
- Eskom must bring an offer to the table to register a servitude across their properties.
- Further meetings would be necessary.

Mr Wessels – representative / owner of Ouplaas 304 Portion 6 / Idwala Mine

AMP Management & Land Acquisition (the route negotiators appointed for this Eskom project) contacted Mr Wessels to discuss the project. The new Route Alternative 2 (map attached in Appendix A4) will miss Idwala Mine. This route will be further assessed during the EIR phase of the project.

Mr Dick Berlijn, Managing Director of Subsolar

The BID was received via the owners of farm Hay 457, with which Subsolar has a lease option with. A solar PV plant is planned on this property. The Olien-Manganore line would cross right through the solar plant.

Mr Edwin Austin, Senior Housing Officer: U/G Expansion Project: Petra Diamonds - Finsch Diamond Mine: Farm Grootvlei

- Both alternatives will impact on Grootvlei and since there are existing Eskom lines crossing the property the impact of additional power lines may be too great.
- A solar plant is also planned to be constructed on Grootvlei

Mr Nicolas Loubser, Director: Golden Falls Properties (Pty) Ltd

It is the attention of Golden Falls Properties (Pty) Ltd, RE Capita (Pty) Ltd and Atlantic Energy Partners to develop a CSP solar plant on Portion 4 of the Farm Kapstewel 436. An EIA is currently underway for this solar plant. The power line route Alternative 2 may impact thus on the planned development on Portion 4 of the Farm Kapstewel 436. Alternative 1 would not pose any problems.

Mr Paul Lambrechts, Thabile Engineering: on behalf of SolarReserve (Pty) Ltd

SolarReserve plans to construct a 100MW CSP and the proposed route will have a direct impact on the plant.

Ms Andrea Gibb: SiVEST Environmental Division on behalf of SolarReserve South Africa (Pty) Ltd

Application forms were recently submitted for 132kV power lines that will run from a proposed solar plant near Lime Acres and connect to Olien Main Transmission Substation. Some of their proposed power line corridor alternatives will traverse some of the power line route alternatives for the Eskom Kimberley Strengthening Phase 4 Project.

Mr Brad Potgieter, owner of the Farm Bergmanshoop, Portion 4

- Mr Potgieter formally object to Route Alternative 2, specifically between bend points 2G & 2H.
- Not all alternatives were included and assessed, as per the requirements of NEMA.
- Suggested Route Alternative 3 should be included in the EIA process:
 - From the Ulco Substation in a northern direction running adjacent to the R31 up to where it meets the railway line;
 - Then turning west and running adjacent to the railway servitude up to point 2K as indicated on the map.
 - This alternative will support the environmental best practice principle of congregating utility services in the same corridor to reduce habitat fragmentation and edge effects. It furthermore reduces construction and maintenance cost because it is shorter than Alternative 2.
- The route alternative as proposed in the BID is not compatible with the current operations and land use on the Farm Bergmanshoop in that it will negatively impact on the current and future business objectives:
 - Creating a corridor for access to the farm for poaching of rare species, in particular Roan, Sable and Buffalo.
 - Affecting the sense of place and aesthetic value of the farm which rely on international photographic tourists and hunting operators.
 - Creating edge effects and increasing the risk of veld fires.
 - Creating various negative social impacts during construction and operation.

Mainstream Renewable Power SA: Solar Development Project Manager: Mr Jonathan Frick

- The servitude corridor between Boundary and Ulco impacts on 3 of Mainstream's projects:
 1. Most notably is the servitude route to the north designated to run through our constructed round 1 solar PV plant indicated by the red square in the image (Boundary – Ulco proposed route obstacles).
 2. Additionally the same northern route runs across the Droogfontein PV 2 (Bid in in round 2 of the REIPPP) and Droogfontein PV 3 both developed solar PV projects.
 3. Finally both routes potentially cross the 132kV grid connection planned for Droogfontein PV3 project connecting into Homestead SS.
- To the south of ULCO the servitude routes cross 3 land parcels which they have under option as well as the area where they are developing a number of solar projects. If the southern route into Ulco is taken there would overlap of the projects.

Mr Brett Barlow, owner of the Farm Weltevreden 214

There are CITES animals on his farm, and a new power line, together with the two lines that already crosses his farm, will have an unacceptable impact on farming activities.

Mr Simon Gear, Birdlife SA

Although the lines are in the vicinity of some important bird populations, they do not specifically traverse areas of particular concern. The best anti-bird collision practice must however be implemented and appropriate technology be deployed on the lines.

Mr Andries David Scheepers and Ms Chrisna Scheepers – owner of Farm Carters Block 458/7

Comment received before the open day:

- The farm has been bought 10 years ago without any infrastructure and since then, several infrastructure and other improvements were added to the farm.

- The farm is 753, 4233 hectares in size which is too small to make it an economical viable unit for profitable farming. The proposed powerline cuts the farm in half and the servitude could add up to 27.5 hectares in total. This will definitely have a negative impact on the farming activities and it will have a negative impact on the value of the property.
- Eskom workers left gates open, don't lock gates properly and use farm roads – all which pose an increased security risk. Eskom workers used the farms roads before and got stuck in the mud and the furrows and trenches that were made were not fixed afterwards. Another line over their property will increase the number of Eskom workers on their property.
- It seems like the power line runs in front of the farm house, which is unacceptable.
- The power line should not be constructed on their property.

Comment received after the open day:

- The proposed route crosses his property and it is not acceptable. The line could however run on the northern border of the middle and western camps of his farm.
- Gates to be erected should be of acceptable quality and current sub-standard Eskom gates should be replaced.
- Eskom workers will only be allowed to use the roads underneath the power lines and not any other farm roads. Workers are not allowed on the farm, except within the power line servitude.
- The fact that gates are being left open by Eskom personnel poses a security risk and this is not acceptable.
- Plans must be put in place for the protection of animals, property and equipment and Eskom must take responsibility for any damage that may be caused.

Mr Deon Janssen – PPC Lime Mining & Manufacturing Facility, Consolidated Carter Block

- The proposed route corridors do not cross proposed mining areas.
- Mr Janssen were also contacted by other consultants doing EIA work for Eskom Distribution, as well as Eskom's IPP Section for upgrade of existing distribution lines and installation of new distribution lines from proposed solar plants in the same areas, on the same properties, but slightly different corridors. In discussion with Eskom customer representative, it would appear that these three Eskom Departments are not aware of the projects that each is doing in the same area, on the same properties - can environmental assessments for the entire proposed area not be shared between the projects?

Mr Charlie Berrington - AE-AMD Renewable Energy (Pty) Ltd

They have just bid the Olien PV power project in Round 4 of the DoE's REIPPPP. Draft SG lease area diagrams that indicate the portion of the Remainder of Farm No 300 Barkley West Administrative District as well as the Preliminary Implementation Layout of the proposed solar PV power plant were attached to his comment.

South African Heritage Resource Agency

SAHRA is unable to issue a Final Comment as more information is required. Based on the submitted information, it is likely that the proposed development will impact significant heritage resources. As such, SAHRA requires that a field based heritage impact assessment (Phase 1 HIA) be completed that assesses the impact of the proposed development on all heritage resources including, but not limited to, archaeological heritage, rock art, any significant structures and intangible heritage. This assessment must not only assess impacts in terms of the development footprint, but must also assess broader, indirect impacts to heritage that may result from the proposed development.

This assessment must satisfy SAHRA's minimum requirements for impact assessments and must comply with the requirements in Section 38(3) of the NHRA and as such, this assessment must provide recommendations regarding the mitigation of any identified direct and indirect impacts to heritage resources. No further assessment of impacts to palaeontological heritage is required.

Response from Landscape Dynamics

- *Their comment was forwarded to the heritage specialist to take into account when the final studies are conducted during the EIR phase of this project.*
- *The Scoping Report as well as EIR report will be submitted to SAHRA via the SAHRIS website.*

5.3.2 MAIN CONCERNS RAISED AT THE PUBLIC OPEN DAY

The PowerPoint presentation as presented at the Open Day is attached in Appendix E(5)

The project components, EIA process as well as the key findings of the specialist studies up to date were communicated at the Open Day. A Draft Environmental Sensitivity Map was presented on which additional comment was added to during discussions.

It was explained during the introduction to the meeting that the route alternatives as presented are in draft form and that the routes may change considerably – the routes as presented were identified to kick-off route negotiations, specialist studies and investigations. Concerns raised during the EIA process will determine the final route which will be presented to DEA for Environmental Authorisation.

Once the Environmental Authorisation is in place, Eskom will appoint evaluators to evaluate the land and establish the compensation price according to the current market value of the land. This would be negotiated with the landowners. Servitudes with a 55m width will be registered for the purpose of the power line. Eskom will have the right to access the servitude for construction, maintenance and inspection purposes.

Discussions took place after the presentations were given at the two respective meetings.

It was stated by Landscape Dynamics that concerns raised at the meeting must also be put in writing so that formal responses thereto can be provided in the Draft Scoping Report. Very little written concerns were however received after the meeting. The main issues and comments raised can be summarised as follows:

- The Eskom maintenance teams which maintain existing power lines very often cause damage to property and farm roads, cutting trees without permission, leaving farm gates open, etc.
Response: Eskom has official complaint procedures which should be followed in this regard. The EMP that will be compiled during the EIA phase will include the relevant contact details and complaints structure to address these enquiries and claims.
Regarding the new transmission power lines, it is important to note that the construction and maintenance teams will be bound by the stipulations as per the EMP. Each landowner will receive a copy of the EMP and they can ensure that the various contractors abide by the EMP. It was emphasised that the landowners could forward specific conditions to Landscape Dynamics for inclusion in the EMP.
- Reasonable compensation would be required. Numerous game farms focus on eco-tourism, exotic farming and hunting and compensation negotiations should accommodate these land uses.
Response: This should be communicated with the evaluators. The landowners will have the opportunity to meet with them on site.
- A concern was raised that land is not usable for grazing for a period up to a year during the construction period. Compensation should take this loss of income into account.
Response: This should be communicated with the evaluators. The landowners will have the opportunity to meet with them on site.
- Eskom power lines are not suitable at all in areas where game farming is dependent on management via helicopters.
Response: Noted
- A question was raised on the safe distance between houses and power line servitudes.
Response: Houses can be built immediately adjacent to the 55m servitude.

- The concern was noted that from the Visual Impact Report it is taken that power lines are generally considered a visual intrusion within 3km from the line.
Response: It will be strived to accommodate this issue as far as reasonably possible with the final route corridor alignment.
- The power line should run as close as possible to railway lines, so that existing infrastructure can be utilised for the new power line. This could also assist in reducing habitat fragmentation and edge effects.
Response: It was explained by the Eskom engineers that the Eskom power lines may cross railway lines, but it may not run adjacent to railway lines. It should be at least 1km away from existing railway lines.
- A concern was raised that some of the specialist reports were lacking important information, because not all game farms had been listed.
Response: The reports were still in draft format and would be finalised in appropriate detail for the Scoping Report.
- The need for the project was questioned. The concern was raised that eco-tourism and game farms will be impacted on to accommodate future mining that would ruin the current businesses.
Response: Eskom has to plan and augment the Transmission System in Accordance with the South African Grid Code. In the past 15 years load, has increased in the Hotazel-Kuruman-Kathu-Kimberley-Dealesville corridor by 32.5%. The forecast in this corridor anticipates a huge load growth due as a result of high mining activities (diamond, manganese and iron ore mining), electrification and the establishment of small businesses in underdeveloped areas as well as increased housing densities and commercial development in developed areas. Growth is anticipated to quadruple in the next 25-30 years. The existing network will not be able to support the Hotazel-Kuruman-Kathu-Kimberley-Dealesville corridor load past 2021, strengthening will therefore be required to support the forecasted load and potential renewable generation.
- Numerous solar developments had been confirmed and indicated on the Draft Environmental Sensitivity Map.
Response: This will be considered in the final proposed route corridors.
- The question was raised why the new power lines could not be strung on the existing pylon structures.
Response: It was responded by Eskom that bigger conductors are required, resulting in a requirement for bigger structures and the existing pylons had not been built with that in mind. It would be required to decommission the existing lines, resulting in a break-down of power supply. Bigger servitudes would also have to be registered. It is not technically viable.
- It was requested that the routes focus on existing road alignments to limit impact.
Response: Eskom generally strives to restrict route alignments as far as technically and environmentally viable along existing infrastructure such as roads, property boundaries and existing power lines.

The outcome of the meetings can be summarised as follows:

- Numerous objections regarding the proposed route alternatives were received.
- The fact that the power line project is a necessity was realised; therefore the general feeling of the affected landowners is that of support for the project. Further communication with regards to a practical and viable route corridor is required.

It was concluded that further stakeholder meetings and significant communication will take place between Landscape Dynamics, AMP (the route identification specialists on the project team) and the key stakeholders, specifically the directly affected landowners. The main aim of the discussions would be to establish a recommended route corridor with viable alternatives. Viable route alternative corridors which result from the Scoping Phase will be provided in the Draft Scoping Report on which all the Interested & Affected Parties would have the opportunity to comment.

Furthermore, the relevant specialist studies would be updated to accommodate new information supplied at the Public Open Day.

5.3.3 WRITTEN COMMENT RECEIVED ON THE DRAFT SCOPING REPORT

Correspondence between I&AP's and Landscape Dynamics are attached in Appendix E(7).

Northern Cape Province: Department of Agriculture, Forestry & Fisheries: Chief Forester: NFA Regulation: Ms Jacoline Mans

1. The Directory: Forestry Management (Other Regions) in DAFF is mainly concerned about the potential impact on protected tree species. See the National Forest Act, Act 84 of 1998 (NFA) as amended, section 12(1(d) read with section 15(1) and section 62(2)(c). The most recent list of protected tree species was published in GN 908 of 21 November 2014. *No protected tree may be damaged, disturbed, cut or destroyed without a valid Forest Act license, irrespective of other authorisations and approvals.*

The DAFF is also responsible for the administration of the National Veld and Forest Fires Act, Act 101 of 1998 (NVFFA). Please take note of responsibilities in terms of the NVFFA.

2. Page 19 of the Draft Report refers to vegetation clearance required for the construction of the power line over a distance of approximate 133km and stated that tall trees will be cleared along the entire length of the servitude. The DAFF would like to point out that the total width of (55m or 27.5m on either side of the line) may not be cleared of protected trees. The DAFF / Eskom developed a document in 2012 titled: "*Basic Guidelines for the handling of EIAs and License Applications for Eskom SOC Holdings Linear Infrastructure affecting Natural Forests, Protected Trees or State Forests*". According to this document and in relation to new planned Eskom linear infrastructure, "protected trees do not need to be removed from the whole servitude, only from under the lines (this is not necessary for smaller tree species such as Shepherd's trees) and trees in the way of towers to be erected". The Northern Cape is a semi-arid region and unnecessary clearance of vegetation may expose soil, subjecting it to wind erosion that may take many years to recover after disturbance.
3. Page 32 refers to protected tree species observed in the proposed corridors, but only mentioned NFA listed protected tree species. Kindly note that some of the affected vegetation types, especially the Ghaap Plateau may contain provincially protected tree species such as Wild Olive (*Olea eurapaea* subsp *Africana*). To disturb plants protected under the Northern Cape Nature Conservation Act, Act 9 of 2009 (NCNCA), a Flora Permit must be obtained from the provincial Department of Environment and Nature Conservation (DENC) in Kimberley.
4. Areas with higher density protected trees (national and provincial) should be avoided as far as possible.
5. A copy of the EIA Report should be submitted to the Department once available.

Response from Landscape Dynamics

- *This information was forwarded to the botanist for inclusion in the Vegetation and Faunal Report (to be submitted with the EIA Report).*
- *These stipulations will also be included in the EMP (to be submitted with the EIA Report).*

The Northern Cape Province: Department of Environment & Nature Conservation: Environmental Officer, Environmental Quality Management: Ms Dorien Werth

- The Department awaits the Final Scoping Report for review.

Response from Landscape Dynamics

- *Landscape Dynamics responded to the Department as follows:*
 - *The Draft Scoping Reports were distributed for comment and the Final Scoping Reports will be submitted to DEA for approval.*

- *Should the Department wish to make any further comment on the Draft Reports, it should be done within the next 2 weeks. If no comment from the DENC is received, it will be assumed that the DENC awaits the Draft EIR to submit further comment.*
- *No further comment from the Department was received.*

5.4 ISSUES RAISED DURING THE ENVIRONMENTAL IMPACT REPORT PHASE

5.4.1 COMMUNICATION WITH STAKEHOLDERS DURING THE EIR PHASE

Continuous liaison is required for a project of this magnitude and the following comment was received after submission of the Final Scoping Report to DEA (attached as Appendix E8).

Atlantic Renewable Energy Partners (Pty) Ltd: The Director – Mr David Peinke

AEP has been developing the Postmasburg Solar PV Energy Facility 2 project around the Manganore Substation just north of Postmasburg.

One of the stipulations in the comment ("*Eskom requirements for works at or near Eskom infrastructure*") made by Eskom to AEP reads as follows:

- Eskom must be informed of any concentrated solar & photovoltaic activity within a 5km radius of a substation. Where concentrated solar & photovoltaic plants fall within a 2km radius of the closest point of a substation, Eskom should be informed in writing during the planning phase of such plant or structure.

AEP also need to be informed of any lines entering the Manganore Substation from both the Ferrum and Olien Substations.

Response from Landscape Dynamics

- *Ms Lindiwe Motaung, Snr Advisor Environmental Management, Eskom Group Capital Division received the original email from Mr David Peinke and Eskom was therefore informed of the activities of AEP.*
- *AEP is added to the IAP list of both the Ulco-Olien-Manganore Project as well as the Manganore-Ferrum Project.*

5.4.2 WRITTEN COMMENT RECEIVED ON THE DRAFT ENVIRONMENTAL IMPACT REPORT

Correspondence between I&AP's and Landscape Dynamics are attached in Appendix E(10).

The Draft Environmental Impact Report was distributed to all the registered Interested and Affected Parties as well as key stakeholders, including all directly and potentially affected landowners, and the following comment was received:

South African Heritage Resource Agency: Case Officers: Mr Phillip Hine, Ms Jenna Lavin and Mr Andrew Salomon

An email was sent on 8 September 2015 to above-mentioned case officers, informing them that the final HIA's and Route Maps were uploaded on SAHRA for their perusal and comment.

A further email was sent on 28 October, reminding them that comment was required. The deadline for comment was extended from 19 October to 30 October and the email specifically stated the following: "If no comment is forthcoming, it will be seen that SAHRA has no further comment on these development proposals."

No further comment / reply to the email was received and it is therefore concluded that SAHRA has no further comment on this Eskom power line project.

South African Civil Aviation Authority: Obstacle Specialist: Procedure Design and Cartography: Mr Harry Roberts

SACAA has no objection to the routing as depicted on the KMZ file accompanying their email. Should the route differ from that which is depicted, this comment will become null and void, subject to a new review of the route proposed. They requested information regarding the intended height of the pylons.

Response

Technical information regarding the pylons that could be used for the Eskom Kimberley Strengthening Phase 4 project was included as Appendix B in the Environmental Impact Report and the following information was also provided in the EIR:

Different pylon structures are being considered for this project. Find attached diagrams with their dimensions attached in Appendix B. They include the following:

- *Guyed Suspension Type- Top width 23m; total base width 26 meters with pointed tower base in the centre, height average 33m*
- *Cross-Rope Suspension Type – Top width 29m; distance between base towers 21 meters, height up to 38m.*
- *Strain Tower Type – Top width 22,8m; base width 22,8; total base 55 meters; height average 33m*
- *Double Circuit (where more than one power line is carried via the same pylons) – Top width 12,6m; base width 8,05m; height average ranging between 30m and 61,22m.*

The proposed “double circuit” line is a worst case scenario. It will only be used where no other viable alternative is possible due to huge financial implications and construction constraints.

The final pylon structure will however only be determined during the design phase. The choice of pylon structure will be guided by the site-specific characteristics, i.e. geology, soils, topography, landowners’ preference, etc. At this stage it does however appear as if the ‘Cross-Rope Suspension Type’ pylon is favoured by the engineers for this project specifically.

Department of Agriculture, Forestry and Fisheries: Zilungile

There are protected trees within the development area and the Department therefore requested that a site visit should be undertaken before comment can be supplied.

Response

The extent of the project is as follows:

- *The total Eskom Strengthening Phase 4 Project entails the construction of an approximate 390km 400kV power line. Environmental authorisation is requested for a 2km wide corridor within which a 55m servitude will be registered.*
- *During the EIA process the ecological specialist did confirm that protected species occur within the route corridor alternatives. Note that only once environmental authorisation is obtained for a specific corridor for each of the four sections can Eskom start with the detail design of the powerline. As soon as the proposed positions of the pylons are identified within the approved corridor will a Site Walk-down with the relevant Eskom engineers; the ecologist; the bird impact specialist; the freshwater specialist and the archaeologist take place. During this Site Walk-Down the protected trees that require permits from the Department will be marked and coordinates will be identified and permits will be prepared for submission to your office.*
- *Due to the reasons supplied above, a detailed site investigation at this stage will not be time and cost effective since the approved route corridor had not been confirmed yet and the locality of protected species had also not been identified.*
- *It is therefore strongly recommended that the Site Walk-Down be attended by the Department at the time*

that it takes place; or else that the Department attends a site investigation to the relevant areas of concern where the permits are required once more specific detail in that regard becomes available, when the permit applications are submitted to the Department. We could include your requirement to attend the Site Walk-Down in the Environmental Management Plan as a condition, should the Department wish to do so.

- *Written comment in terms of the way forward and the Department's requirement in terms of compliance with the Department's legislation should be submitted.*
- *Landscape Dynamics further requested that complete contact details should be submitted since it is not sure from which office Zulingile is since comment from the Northern Cape Forestry Branch was already received.*

No further comment from the Department was received.

The Northern Cape Department of Environment & Nature Conservation: EIA Administration: Ms L Tools-Bernardo

The Department acknowledged receipt of the hard and electronic copy of the Draft EI Report on 9 September 2015. The application has been assigned the reference number NC/MAT/FB/SOL/KIM/2014 and the responsible officer is Mr T Mthombeni.

Response from Landscape Dynamics

- *Comment noted*
- *No further comment from the Department was received.*

SA National Roads Agency: Statutory Control: Ms Rene de Kock

If services need to be constructed over or under the national road or within 60m measured from the road reserve fence, the service owner must apply for a written permission from SANRAL, before any work may be carried out.

Response

- *A Way Leave Application will be made to SANRAL should it be required.*
- *Please refer to comment below*

SA National Roads Agency: Ms Nicole Abrahams

SANRAL has received the background information document and after a detailed review of the extent of the proposed project scope it was established that the project will not impact on SANRAL jurisdiction in any way hence no further comments will be forthcoming from this office.

Response

- *Comment noted*

The Department of Fisheries and Forestry: Mr B Thoko

Mr Thoko copied Landscape Dynamics on an email that he sent to a Ms de Lange, requesting that she should process the notification email accordingly.

Response

- *No further comment was received.*

5.5 CONCLUSION OF PUBLIC PARTICIPATION

The main issues raised during the public participation process are related to the following:-

- Impact on future planning , i.e. solar energy farms
- Impact on existing land use – eco-tourism, hunting, agriculture
- Impact on natural environment – vegetation, wildlife and avi-fauna
- Visual Impact
- Cumulative impact of additional power lines on properties with impact on property values
- Eskom access during the operational phase is problematic in terms of security, poaching and veld fires

These issues are addressed in this chapter in what is believed to be a fair and satisfactory manner. Relevant mitigatory measures and specifications are prescribed in the Environmental Management Plan in Appendix F.

The main objective of the Public Participation Programme undertaken for this project was to identify viable route corridors that are not only acceptable from an ecological point of view, but also from a landowner perspective. It should be noted that it is very difficult to meet this goal with a project of this magnitude; however the EAP is confident that reasonable consensus was reached regarding the preferred and alternative route corridors presented in this document.

CHAPTER 6: IMPACT ASSESSMENT AND PROPOSED MITIGATION MEASURES

6.1 METHODS USED TO IDENTIFY IMPACT

Environmental issues and impacts have been identified through the following means:

- Correspondence with Interested and Affected Parties, including directly affected landowners, general stakeholders and relevant authorities;
- Consultation with the EIA Project Team, supported by the Eskom Project Team;
- Evaluation and consideration of relevant existing environmental data and information;
- The general knowledge and extensive experience of the Environmental Consultants in the field of Environmental Impact Assessments for linear development planning.

6.2 ASSESSMENT OF IMPACTS ASSOCIATED WITH THE DEVELOPMENT

The impacts below are assessed according to the following criteria:

Extent of impact	Explanation of extent
Site	Impacts limited to construction site and direct surrounding area
Local	Impacts affecting environmental elements within the local area / district
Regional	Impacts affecting environmental elements within the province
National	Impacts affecting environmental elements on a national level
Global	Impacts affecting environmental elements on a global level

Duration of impact	Explanation of duration
Short term	0 - 5 years. The impact is reversible in less than 5 years.
Medium term	5 - 15 years. The impact is reversible in less than 15 years.
Long term	>15 years, but where the impacts will cease if the project is decommissioned
Permanent	The impact will continue indefinitely and is irreversible.

Probability of impact	Explanation of Probability
Unlikely	The chance of the impact occurring is extremely low
Possible	The impact may occur
Probable	The impact will very likely occur
Definite	Impact will certainly occur

Magnitude/Intensity of impact	Explanation of Magnitude/Intensity
Low	Where the impact affects the environment in such a way that natural, social and cultural functions and processes are not affected
Moderate	Where the affected environment is altered, but natural, social and cultural functions and processes continue albeit in a modified way
Severe	Where natural, social and cultural functions or processes are altered to the extent that it will temporarily or permanently cease

Significance of impact	Explanation of Significance
None	There is no impact at all
Low	Impact is negligible or is of a low order and is likely to have little real effect
Moderate	Impact is real but not substantial
High	Impact is substantial
Very high	Impact is very high and can therefore influence the viability of the project

6.2.1 EXPECTED NEGATIVE IMPACTS

Please note that mitigation measures as supplied below are also included in the Environmental Management Plan.

IMPACT EVALUATION: ROUTE ONE CORRIDOR (PREFERRED)

VEGETATION

Loss of flora, fauna and habitat

The construction of pylons will lead to the destruction and loss of vegetation, which can result in degradation of the environment, loss of vegetation cover and resultant erosion and loss of topsoil, increase in water runoff and less water infiltration, loss of habitat for sensitive or secondary species, reduction of species richness and system diversity and eventual loss of ecosystem functioning and species composition.

Habitat fragmentation (loss of landscape connectivity)

Habitat fragmentation refers to destruction of the habitat leading to a discontinuity in a species/populations' the environment. The remaining habitat therefore becomes smaller.

Loss of vulnerable species

Not only will the loss of vulnerable species cause further degradation of the environment and the conservation status of the ecosystem, but it will alter also the functioning of adjacent ecosystems and their species compositions.

Invasion of invader plants and declared weeds

Weeds, alien invasive and indigenous invasive plants are normally aggressive growers that can out-compete other natural species growing in the environment.

Impact Description	Significance Without Mitigation	Extent	Duration	Probability	Magnitude / Intensity	Significance After Mitigation
Loss of flora, fauna and habitat	Low	Site	Short / Medium	Probable	Low / Moderate	Low
Habitat fragmentation (loss of landscape connectivity)	Moderate / Low	Site	Short	Possible	Low	Low
Loss of vulnerable species	Low	Site / Local	Medium	Possible	Low / Moderate	Low
Invasion of invader plants and declared weeds	Moderate	Site	Medium	Possible	Moderate	Low

Mitigation

Protected trees

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

- *Vachellia erioloba* (Camel thorn) have been recorded within Vegetation Units 1, 2 and 5 (more species may be found during the walk-down exercise).
- The Directory: Forestry Management in the Department of Agriculture, Forestry and Fisheries (DAFF) is mainly concerned about the potential impact on protected tree species. The most recent list of protected tree species was published in GN 908 of 21 November 2014. *No protected tree may be damaged, disturbed, cut or destroyed without a valid Forest Act license, irrespective of other authorisations and approvals.*

Preparation of servitude / vegetation clearance

- The procedures for vegetation clearance and maintenance within overhead power line servitudes and on Eskom owned land, updated September 2009 or latest approved revision thereafter, must be implemented (EPC 32-247).
- Vegetation clearance is often one of the very first activities of construction. The Project Coordinator shall inform the ECO before the vegetation clearance contract is issued. Vegetation clearance is considered commencement of construction. Eskom needs to notify the DEA of its intention to commence with construction before vegetation clearance can commence.
- Indigenous vegetation which does not interfere with the safe operation of the power line should be left undisturbed.
- Clearing for pylon positions must be done to the minimum required for that specific pylon.
- Vegetation clearing during construction must be restricted to the footprint of the substation infrastructure only and the power line servitude.
- Existing access roads must be used as far as possible and the creation of new access tracks for power line construction should be minimised.
- Unnecessary impacts (such as driving off road) on surrounding natural vegetation must be avoided.

Control of alien vegetation

- Alien vegetation in servitudes shall be managed in terms of the Regulation GNR.1048 of 25 May 1984 (as amended) issued in terms of the Conservation of Agricultural Resources Act, Act 43 of 1983. In terms of these regulations, Eskom shall “control” i.e. to combat Category 1, 2 and 3 plants to the extent necessary to prevent or to contain the occurrence, establishment, growth, multiplication, propagation, regeneration and spreading such plants within servitude areas or land owned by Eskom.
- The use of herbicides shall be in compliance with the terms and conditions of The Fertilisers, Farm Feeds, Agricultural Remedies and Stock Remedies Act, 1947 (Act 36 of 1947).
- A total of two different declared alien invasive species, the tree *Opuntia ficus-indica* (Unit 2) and *Cylindropuntia imbricata* (Unit 1) were found within the study area. *Opuntia ficus-indica* and *Cylindropuntia imbricata*, are declared category 1 weeds (CARA) and category 1b plants (NEMBA). All category 1 plants must be removed and eradicated by the land owner by law. It is therefore important that these plants are removed from the different vegetation units and that a programme is implemented on a long-term basis to control the spread of these plants.
- All alien vegetation should be eradicated along the servitude. Invasive species (*Prosopis glandulosa*; *Nicotiana* spp.) should be given the highest priority.
- No dumping of any materials in undeveloped open areas and neighbouring properties.
- Activities in the surrounding open undeveloped areas (especially the rocky hills and koppies must be strictly regulated and managed.
- It is imperative that the construction activities as well as vegetation clearance are restricted to the powerline servitude. The limitation of the disturbance of vegetation cover within the servitude will ameliorate this impact.

Protection of flora

- No animals or birds may be fed, disturbed, hunted or trapped. Severe contractual fines must be imposed and immediate dismissal on any contract employee who is found attempting to snare or otherwise harm remaining faunal species.
- No plant material may be removed if not part of identified vegetation clearance.
- Workers must be limited to areas under construction within the corridor and access to the undeveloped areas, especially the surrounding open areas must be strictly regulated (“no-go” areas during construction activities).
- Provision of adequate toilet facilities must be implemented to prevent the possible contamination of ground (borehole) water in the area.
- All temporary stockpile areas including litter and dumped material and rubble must be removed on completion of construction. All alien invasive plant should be removed from the site to prevent further invasion.
- Contract employees must be educated about the value of wild animals and the importance of their conservation.
- All vegetation not interfering with the operation of the line shall be left undisturbed. This is especially pertinent to the protected Shepherds Tree (*Boscia albitrunca*) as well as Camel Thorn (*Acacia erioloba*). None of these species may be removed without permission from the DAFF & Nature Conservation.
- Collection of firewood and traditional medicinal plants is strictly prohibited.
- All alien vegetation should be eradicated along the corridor.
- Remaining indigenous bulbous geophytes should be retained or replanted wherever possible. Where herbicides are used to clear vegetation, specimen-specific chemicals should be applied to individual plants only. General spraying should be prohibited.

Rehabilitation

A suitably qualified rehabilitation specialist should be appointed for the commencement of rehabilitation activities. The specialist should identify areas requiring rehabilitation as well as appropriate seed mixes which are required. Photographic records of the servitude and access roads prior to construction activities and after the construction phase will be taken to assess the level of rehabilitation and re-vegetation.

FAUNA (MAMMALS, REPTILES AND AMPHIBIANS)

Disturbance to and/or destruction of habitat and illegal placement of snares could have an impact on fauna breeding, foraging and roosting in or in close proximity of the servitude. Thus it is important that no unnecessary destruction of the habitat takes place during any development/construction phase.

Impact Description	Significance Without Mitigation	Extent	Duration	Probability	Magnitude / Intensity	Significance After Mitigation
Disturbance / destruction of habitat	Moderate / Low	Local	Short	Possible	Moderate	Low

Mitigation

Mammal management recommendations

- All large indigenous tree species should be conserved wherever possible as they form important habitat for arboreal mammal species.
- Activities should be restricted away from any rocky hills and outcrops as well as riparian habitats along the non-perennial drainage lines.
- The conservation and correct management of the Vaal and Harts Rivers riparian habitats along the proposed servitudes should ensure the conservation of all remaining suitable habitat for wetland/riverine associated mammals on the site (Cape Clawless Otter).
- No hunting or poaching activities must be allowed along the servitudes during all phase of the project.

Reptile management recommendations

- No rock removal should occur adjacent to the proposed towers. No termite mounds should be intentionally destroyed. If any moribund termite mounds have to be destroyed due to tower position it should be carefully excavated by hand and pick.
- Any animals rescued or recovered will be relocated in suitable habitat away from the transmission tower and line.
- Trees including stumps; bark and holes in trees are vital habitats for numerous arboreal reptiles (chameleons, snakes, agamas, geckos and monitors).
- The removal of indigenous tree species (*Vachelia erioloba*) as well as clearance of the riparian vegetation along the Vaal and Harts Rivers must be kept to the minimum wherever possible.
- Exotic cleared vegetation should form wood piles and logs and stumps. Dead or decaying wood piles should be created as these will provide valuable refuge areas especially due to the clearance of vegetation cover. Logs and stumps also provide important habitats for several reptile species as well as smaller mammals, amphibians, arachnids and scorpions. With time they will eventually be reduced to valuable compost by several animal species. Dead trees and stumps will also be used for nesting purposes by barbets, hoopoes, owls, hornbills as well as perching or hunting platforms for birds like the kingfisher.
- Any lizards, gecko's, agamids, monitors or snakes encountered should be allowed to escape to suitable habitat away from the disturbance. No reptile should be intentionally killed, caught or collected during any phase of the project.
- Several venomous snake species occur along the proposed lines including Cape Cobra (*Naja nivea*) and Puff Adder (*Bitis arietans*).
- General avoidance of snakes is the best policy if encountered. Snakes should not be intentionally harmed or killed and allowed free movement away from the area.
- Appropriate foot wear (sturdy leather boots) should be worn in the field.

Amphibian management recommendations

- Construction activities should be restricted to daylight hours reducing the potential impact on the nocturnal breeding activities of the majority of amphibian species.
- Ideally the installation of the new towers should be undertaken during the dry winter months (May-September) when the majority of amphibian species are dormant.
- The towers should ideally not be placed in any seasonal wetland habitats and should be positioned outside the temporary wet areas.
- No Giant Bullfrogs must be collected for food or illegal pet trade.
- As a precautionary mitigation measure it is recommended that the developer and construction contractor as well as an independent environmental control officer (ECO) should be made aware of the possible presence of certain threatened amphibian species (Giant Bullfrog) prior to the commencement of construction.

AVIFAUNA

Displacement due to habitat destruction

During the construction phase and maintenance of power lines and substations, some habitat destruction and transformation inevitably takes place. This happens with the construction of access roads, the clearing of servitudes and the levelling of substation yards. Servitudes have to be cleared of excess vegetation at regular intervals in order to allow access to the line for maintenance, to prevent vegetation from intruding into the legally prescribed clearance gap between the ground and the conductors and to minimize the risk of fire under the line, which can result in electrical flashovers.

These activities have an impact on birds breeding, foraging and roosting in or in close proximity of the servitude through transformation of habitat, which could result in temporary or permanent displacement. In the

present instance, the risk of displacement of Red Data species due to habitat destruction is likely to be fairly limited, given the nature of the habitat.

Displacement due to habitat disturbance

Apart from direct habitat destruction, the above mentioned construction and maintenance activities also impact on birds through disturbance; this could lead to breeding failure if the disturbance happens during a critical part of the breeding cycle. Construction activities in close proximity could be a source of disturbance and could lead to temporary breeding failure or even permanent abandonment of nests. This is a particular concern where the proposed line crosses the edge of the Ghaap Plateau, as there might potentially be breeding Verreaux's Eagle on the low cliffs along the edge of the plateau.

Collisions

A significant impact that is foreseen for the proposed Boundary - Ulco transmission line is collisions with the earth wire of the proposed line. Collisions are probably the biggest single threat posed by transmission lines to birds in southern Africa. Most heavily impacted upon are bustards, storks, cranes and various species of water birds. The technical aspects of power line design and siting also play a big part in collision risk. Grouping similar power lines on a common servitude, or locating them along other features such as tree lines, are both approaches thought to reduce risk.

Impact Description	Significance Without Mitigation	Extent	Duration	Probability	Magnitude / Intensity	Significance After Mitigation
Displacement through disturbance	Moderate	Site	Short	Possible	Low	Low
Displacement through habitat destruction	Moderate	Site	Short	Possible	Low	Low
Collisions	Moderate	Regional	Short	Probable	Moderate	Low

Mitigation

Disturbance to and destruction of habitat

- Disturbance to and killing of birds must be prevented.
- Unnecessary habitat destruction must be avoided.
- The removal of large trees should be avoided if at all possible.
- All dismantling, construction and maintenance activities must be carried out according to best environmental practice principles so as to minimise habitat destruction (see in this respect the Eskom Environmental Procedure, EPC 32-96). The unnecessary removal of large trees IS not allowed (see also in this respect the Procedure for Vegetation Clearance and Maintenance within Eskom owned land, EPC 32-247).

Collisions

Once the final alignments and tower positions have been selected, the sections of the line that would need the application of Bird Flight Diverters to mitigate for potential collisions should be indicated by the avifaunal specialist by means of a "walk-through" exercise. This exercise should be informed by an analysis of satellite imagery supplemented by on site ground-truthing (physical inspection). The type of Bird Flight Diverter to be used and the marking scheme will be determined during that phase of the project.

FRESHWATER FEATURES

Impact of the powerline

- Disturbance / loss of aquatic habitat

Construction Phase

The installation of new foundation and pole structures could be expected to result in some disturbance of freshwater ecosystem habitat and loss of associated vegetation. Flow & water quality modification as a result of increased erosion and invasive plant growth within disturbed areas could also impact on the effective functioning of the *freshwater aquatic systems*.

Operation Phase

Some disturbance of the freshwater features in the area of the constructed power line could be expected that would be associated with the maintenance activities for the project.

Impact of the access roads

- Disturbance / loss of aquatic habit
- Flow and water quality modification

Construction Phase

The major impacts associated with any access roads, should they need to be established, relate to the potential loss of habitat within wetland areas and the streams and drainage channels, invasive alien plant growth, flow and water quality impacts and erosion of river/stream banks and drainage channels.

Operation Phase

The major impacts associated with the access roads during the operation phase relate to disturbance to the instream and riparian habitat of the freshwater ecosystems along the designated routes.

Construction of new Olien Substation

The Great Pan near the Olien Substation could be impacted should the position of the substation does not take the Pan into consideration.

Impact Description	Significance Without Mitigation	Extent	Duration	Probability	Magnitude / Intensity	Significance After Mitigation
<i>Impact of the <u>powerline</u></i> Disturbance / loss of aquatic habitat Construction Phase Operational Phase	Moderate / Low Moderate / Low	Site / Local Site	Short Long	Probable Possible	Low Low	Low Low / None
<i>Impact of the <u>access roads</u></i> Disturbance / loss of aquatic habit Flow and water quality modification Construction Phase Operational Phase	Moderate / Low Moderate / Low	Site / Local Site	Short Long	Probable Possible	Moderate / Low Moderate	Low Low / None
Impact of substation on water features	Moderate	Local	Short	Possible	Moderate	Low

Mitigation

Where the proposed power lines are located close to freshwater features it is proposed that a buffer of 50m from the centre of the drainage lines and approximately 500m (varies depending on wetland cluster) from the edge of the pans be implemented.

Power lines and its structures

- Construction activities should as far as possible be limited to the sites outside the proposed buffer zones.
- Clearing of debris, sediment and hard rubble associated with the construction activities should be undertaken post construction to ensure that flow within the drainage channels are not impeded or diverted.

- Rehabilitate disturbed stream bed and banks and re-vegetate with suitable indigenous vegetation.
- It is important that any of the cleared areas that are not hardened surfaces are rehabilitated after construction is completed by re-vegetating the areas disturbed by the construction activities with suitable indigenous plants. Invasive alien plants that currently exist within the immediate area of the construction activities should also be removed and any regrowth prevented and managed.
- Erosion should be controlled at all times.
- Conditions as specified in the Water Use License or else the General Authorisation issued by the Department of Water and Sanitation must be met.

Access roads

- The existing road infrastructure should be utilised as far as possible rather than creating new ones in order to minimise the overall disturbance created by the proposed project.
- Where access routes need to be constructed through ephemeral streams, disturbance of the channel should be limited and multiple crossings should not be created.
- Riparian areas should be avoided and any road adjacent to the riparian zone should also remain outside of the applicable buffer zones.
- All crossings over drainage channels or stream beds should be such that the flow within the drainage channel is not impeded.
- Road infrastructure and cable alignments should coincide as much as possible to minimise the impact.
- Any disturbed areas should be rehabilitated to ensure that these areas do not become subject to erosion or invasive alien plant growth. To reduce the risk of erosion, run-off over the exposed areas should be mitigated to reduce the rate and volume of run-off and prevent erosion occurring within the freshwater features and drainage lines.

Contaminated runoff from the construction sites should be prevented from entering the rivers/streams. All materials on the construction sites should be properly stored and contained and disposal of waste from the sites should also be properly managed. Construction workers should be given ablution facilities at the construction sites that are located at least 50m away from the river/stream systems and regularly serviced.

The establishment of alien vegetation in the riparian zones should specifically be prevented, and controlled if it does occur.

Substation

The new Olien Substation should preferably be placed west of the existing substation and as close to the railway line as possible.

VISUAL IMPACT

Visual resource impacts would result from the construction, operation, and maintenance of the proposed 400kV transmission power lines. Impacts would result from the power lines being seen from sensitive viewpoints and from effects to the scenic values of the landscape

Impact Description	Significance Without Mitigation	Extent	Duration	Probability	Magnitude / Intensity	Significance After Mitigation
Visual impact	Moderate	Local	Permanent	Definite	Moderate	Moderate

Mitigation

Mitigation measures to reduce the visual impact of transmission lines are generally difficult and costly after the alignment has been determined. To this end, mitigation measures, including alternative route alignment and specific measures for the mitigation of potential conflict areas are usually proposed for corridor options. Screening measures from sensitive viewing areas are difficult to achieve. Resultantly, there is a severe limitation to the mitigation and the management of power lines other than to avoid conflict situations wherever

possible during the planning and public participation process.

To this end and in response to these issues the final alternative route corridor alignments were adjusted to avoid, where possible, conflicts with sensitive landscape and use types (game farms and nature reserves) and residences. The preferred route alignment as proposed in this report is the preferred option from a visual impact perspective.

CULTURAL / HERITAGE

One site of cultural heritage significance was found within the Route One Corridor (Preferred) on the section between the Ulco-Olien substations. However, it would be easy to avoid the site. No further action is necessary with regards to the site identified as long as the development stays at least 20m from it.

Impact Description	Significance Without Mitigation	Extent	Duration	Probability	Magnitude / Intensity	Significance After Mitigation
Placement of pylons on grave sites	Very high	Local	Permanent	Unlikely	Severe	None
Over-spanning grave sites	High	Local	Long term	Unlikely	Moderate	None

Mitigation

It should be noted that due to the nature of the subterranean presence of archaeological and/or historical sites, features or artifacts, the possibility to find these during the course of construction work are always real. Care should therefore be taken, when development work commences, that if any of these are accidentally discovered, a qualified archaeologist be called in to investigate. The results of such an investigation should be submitted to SAHRA and the recommended mitigation measures should be included in the Environmental Management Plan.

By not placing the pylon positions on any sites of significance, no further action will be necessary as these sites may be over-spanned. The only exception is graves which may not be over-spanned and for which a 20m buffer zone is recommended. A final walk-down, to inspect pylon positions, is therefore recommended.

PALAEONTOLOGY

Since none of the rock formations or sediments in the region is potentially fossiliferous, being too old or too young, the proposed project may continue as far as the palaeontology is concerned.

Impact Description	Significance Without Mitigation	Extent	Duration	Probability	Magnitude / Intensity	Significance After Mitigation
Palaeontology	Low	Local	Medium	Unlikely	Low	None / Low

Mitigation

If any fossils are discovered during the excavations then it is strongly recommended that the fossils are rescued and a palaeontologist is called to assess their importance and make further recommendations.

AGRICULTURAL POTENTIAL / AGRICULTURAL ACTIVITIES

Insensitive placement of power lines will have a severe negative impact on current agricultural activities, such as game farming where helicopters are used extensively and agricultural land which is under irrigation.

Incorrect placement could cut through agricultural fields where centre pivot irrigation is being used and will have a severe negative impact since it is not possible to continue with this practise directly underneath power lines.

During the construction period, interference with livestock could also have a negative impact on farming activities.

Impact Description	Significance Without Mitigation	Extent	Duration	Probability	Magnitude / Intensity	Significance After Mitigation
Impact on agricultural activities	Very High	Local	Permanent	Probable	Moderate / Severe	Low

Mitigation

Extensive communication with affected landowners took place and the proposed route alignment takes due cognisance of areas where pivot irrigation is being used as well as helicopter flying patterns in the area.

During consultation with land owners it also became apparent that it will be preferred if the proposed power line can be as close as possible to farm boundaries, existing power lines and existing infrastructure such as roads.

Considering the issue of security, access will be easier to control during construction and maintenance phases next to the existing infrastructure, rather than having the line over the middle of properties.

Planning and development with regards to agricultural activities:

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

Domestic Livestock

- Construction activities must be planned carefully so as not to interfere with the calving and lambing season for most animal species.
- The Contractor's workforce will have to be very careful not to disturb the animals as this may lead to fatalities which will give rise to claims from the Landowners.
- Interference with any wildlife without the applicable permits shall not be allowed.
- The Contractor shall under no circumstances interfere with livestock without the Landowner being present. This includes the moving of livestock where they interfere with construction activities.
- Should the Contractors workforce obtain any livestock for eating purposes, they must be in possession of a written note from the Landowner.
- Speed limits must be restricted especially on dirt roads preventing unnecessary road fatalities of surrounding livestock.

SOILS / EROSION

Concrete foundations will be made for each pylon and substation and new access roads will be constructed. Vegetation will therefore be cleared and there may be an increase in surface water runoff which could lead to soil erosion.

Impact Description	Significance Without Mitigation	Extent	Duration	Probability	Magnitude / Intensity	Significance After Mitigation
Erosion	Moderate	Local	Medium	Possible	Moderate	Low

Mitigation

- To cause the loss of soil by erosion is an offence under the Soil Conservation Act, Act No 76 of 1969. Access roads and site surfaces must be monitored for deterioration and possible erosion. Pro-active

measures must be implemented to curb erosion and to rehabilitate eroded areas. All areas susceptible to erosion must be installed with temporary and permanent diversion channels and berms to prevent concentration of surface water and scouring of slopes and banks, thereby countering soil erosion.

- All cleared areas must be ripped and rehabilitated after construction. The top 200mm layer of topsoil must be removed and stockpiled in heaps not higher than 2m and replaced on the construction areas once the activities have been completed. The affected areas should be replanted with a grass mixture indigenous to the area.
- All vehicle movement must be along existing roads or tracks as far as possible.
- All stormwater runoff must be managed efficiently so as to avoid stormwater damage and erosion to adjacent properties.
- The viability of undertaking construction during the dry months of the year should be investigated in order to overcome possible problems caused by excessive moisture.
- Should any new temporary access roads be required, the following should apply in areas which are prone to erosion:
 - Where a cutting is made, subsoil drains should be installed wherever a perched water table occurs within 900m of the formation in all cuttings and below fills in the alluvial zones.
 - It is further critical to manage surface water. Drains should be provided along the top and bottom of all deep cuttings. This is to minimise the flow of surface water and erosion to the exposed cut faces and erosion along the toe of the cuttings.
 - Steep sections of the service road must be supplied of sufficient drainage areas to reduce flow velocity of run-off water.
 - Any eroded sections must be rehabilitated and part of the management plan must include regular inspections of the water run-off areas.
- If any erosion occurs, rehabilitation must immediately be done.
- All embankments (if any) must be adequately compacted and planted with grass to stop any excessive erosion and scouring of the landscape.
- After construction, all temporary access roads should be rehabilitated.
- The site must be rehabilitated and replanted with suitable, indigenous grass to prevent erosion.
- Should any signs of erosion be evident along the access and maintenance roads during the operational phase of the project, remedial action should take place as soon as possible.

GROUNDWATER

Potential for *groundwater* pollution exists as a result of oil spills, etc. during the construction period

Impact Description	Significance Without Mitigation	Extent	Duration	Probability	Magnitude / Intensity	Significance After Mitigation
Groundwater pollution	Moderate	Local	Long / Permanent	Possible	Moderate	Low

Mitigation

- In all cases, abstraction of water from watercourses for construction purposes will not be allowed. Arrangements must be made prior to construction with the landowners or municipal water must be carted in.
- Under no circumstances must surface or groundwater be polluted.
- Adequate oil containment precautions must be taken.
- If a spill from a construction vehicle occurs it must be reported to ECO with immediate effect. A bio-remediation contractor must be appointed to rehabilitate large oil spills. Small oil spills must be cleaned immediately with an oil spill kit.
- Minimise on-site storage of petroleum products.
- Ensure proper maintenance procedures are in place for vehicles and equipment.

- Servicing of vehicles to be done in designated areas with appropriate spill management procedures in place.
- Ensure that measures to contain spills are readily available on site (spill kits).
- All hazardous substance spills must be reported, recorded and investigated.
- All stormwater runoff must be managed efficiently so as to avoid stormwater damage and erosion to adjacent properties.
- During and after construction, stormwater control measures should be implemented especially around stockpiled soil, excavated areas, trenches etc. to avoid the export of soil into any watercourse.
- Stormwater should not be discharged into the working areas and it should be ensured that stormwater leaving the footprint of the proposed development areas is not contaminated by any substance, whether that substance is solid, liquid, vapor or any combination thereof.
- Stockpiling of construction material and soils should be such that pollution of water resources is prevented and that the materials will be retained in a storm event.
- Drinking water and water for ablution facilities must be provided to all construction workers on the construction site.
- Waste Management

General Waste

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

Construction Waste

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

Sewage

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

Hazardous Waste

- Oil contaminated waste (soil, cloths used to clean small spills, spill kits, content of drip trays, etc.) must be disposed of at a facility that is registered as a hazardous landfill facility.
- All hazardous substances at the site must be adequately stored and accurately identified, recorded and labelled. All these hazardous substances should be disposed of at a H:H registered waste disposal facility.

- Hydrocarbon (oil, diesel, petrol) waste as well as hydrocarbon containing material must be regarded as hazardous waste and separated from general waste.
- Persons who remove hazardous waste must be appropriately qualified and authorised.

AIR QUALITY

Dust created by construction vehicles could impact on air quality during the construction period.

Impact Description	Significance Without Mitigation	Extent	Duration	Probability	Magnitude / Intensity	Significance After Mitigation
Air quality	Low	Local	Short	Possible	Low	Very Low

Mitigation

- Sweeping of construction sites, clearing of building rubble and debris and watering of construction sites (storage areas, roads, etc.) must take place on a regular basis.

NOISE

Labourers and machinery could result in noise pollution during the construction period.

Impact Description	Significance Without Mitigation	Extent	Duration	Probability	Magnitude / Intensity	Significance After Mitigation
Noise	Low	Local	Short	Possible	Low	Very Low

Mitigation

- Should an onsite construction camp be necessary noise made by the workers (i.e. radios) must be limited to early evenings.
- Plan campsites an appropriate distance from any facility where it can cause a nuisance.
- Construction vehicles must be serviced on a regular basis to ensure unnecessary noise is not emitted due to poor vehicle performance.
- Eskom shall provide all necessary equipment with standard silencers and maintain silencer units on vehicles where required. Equipment must always be in good working order to minimise unnecessary noise levels.

COMMUNITY

An influx of workers could result in an increased risk for crime and safety.

Impact Description	Significance Without Mitigation	Extent	Duration	Probability	Magnitude / Intensity	Significance After Mitigation
Community	Low	Local	Short	Possible	Low	Very Low

Mitigation

- Construction workers must be extremely careful not to damage any property along the proposed route. Should any damage occur it should be reported to the ECO and repaired and to a state prior to the damage to the written satisfaction of the landowner and ECO.
- Removal of agricultural products is prohibited.
- No firewood may be collected.
- No open fires are to be made on private property.
- In order to prevent and/or minimise crime, it is required that all construction workers be supplied with controlled serviced accommodation or be supplied with daily transport to and from the site.

- No wandering on adjacent properties is allowed, unless written consent has been obtained from the relevant landowners.
- All adjacent landowners have to be informed of the blasting programme (if applicable) prior to any blasting taking place. Contractors must liaise personally with adjacent landowners. All communication in this regard must be documented. Blasting may only be undertaken by specialists in the field and should be limited to small localised areas. All relevant legislation must be adhered to.
- All contractors and construction workers will be issued with temporary permits to enter the property.
- All construction workers will be allowed only for specified day light hours. Transport should be made available by the contractor to remove labourers from the site after working hours.
- Secure accommodation facilities must be provided for guarding personnel.
- Supervision of labourers must at all times take place.
- Construction hours will be restricted to specific periods that exclude Sundays and public holidays.
- Sweeping of construction sites, clearing of building rubble and debris and watering of construction sites (storage areas, roads, etc.) must take place on a regular basis.
- All excavated areas must be clearly marked and barrier tape must be placed around them to prevent humans and animals from falling into them.

IMPACT EVALUATION: ROUTE TWO CORRIDOR (ALTERNATIVE)

Impacts as described above also apply to Route Two Corridor (Alternative), with additional impacts as described below.

AGRICULTURAL POTENTIAL

Insensitive placement of power lines will have a severe negative impact on current agricultural activities, such as game farming where helicopters are used extensively and agricultural land which is under irrigation.

Incorrect placement could cut through agricultural fields where centre pivot irrigation is being used and will have a severe negative impact since it is not possible to continue with this practise directly underneath power lines.

Impact Description	Significance Without Mitigation	Extent	Duration	Probability	Magnitude / Intensity	Significance After Mitigation
Impact on agricultural activities	Very High	Local	Permanent	Probable	Moderate / Severe	Low

Mitigation

Route One Corridor, the preferred route alignment, will have a far less impact on agricultural activities than the other alternatives assessed.

6.2.2 EXPECTED POSITIVE IMPACTS

The positive impacts of the proposed project on the environment are as follows:

- The project will result in a reliable supply of electricity to the Eskom grid – less power outages and failures are likely to occur;
- With the implementation of the project it is possible to accommodate new development and associated applications for electricity supply in the macro area;
- The proposed Eskom Strengthening Phase 4 Project is being planned in a legal, pro-active and structured manner taking all development components, potential and restrictions into account;
- The project will provide employment and training opportunities, mostly during the construction phase of the project development.

6.3 ENVIRONMENTAL MANAGEMENT PLAN

An Environmental Management Plan (EMP) was compiled and is included as Appendix F in this EIR. The implementation of the EMP will form part of the conditions of the Environmental Authorisation should the project be approved. It is therefore important that the mitigatory measures and site-specific requirements as identified during the entire Environmental Impact Assessment process are correctly reflected in the document.

The main objectives of the EMP are to ensure that

- mitigation measures are identified and implemented to avoid and/or minimise the expected negative environmental impact and enhance the potential positive impact associated with the project;
- the developer, construction workers and the operational and maintenance staff are well acquainted with their responsibilities in terms of the environment;
- communication channels to report on environment related issues are in place.

Specifications are supplied for the following phases of project development:

- Design & Pre-construction Phase
- Construction Phase
- Operational Phase

CHAPTER 7: CONCLUSION

7.1 LEGAL REVIEW

The objectives of the Legal Review for an Environmental Impact Assessment are the following:

- To review the processes followed with relevant to applicable legislation including the National Environmental Management Act, 1998 (Act No 107 of 1998) (NEMA); the National Environmental Management : Protected Areas Act, 2003 (Act No 57 of 2003) and the National Environmental Management : Biodiversity, 2004 (Act No 10 of 2004)
- To consider any legal issues and/or technicalities raised by the Interested & Affected Parties and provide legal opinion in respect thereof.
- To provide a legal opinion on the process followed and any legal issues emanating from that.

All the associated actions, proceedings, specialist input and relevant information as well as the Draft Scoping Report have been supplied to the Legal Review Specialist for the project. The assessment letter for the Scoping Report is included in Appendix G of the EIR.

The Draft EIR was also presented for legal review and the assessment letter is included in Appendix G. The review concluded as follows: "...we are respectfully of the view that the draft EIA adheres to the requirements of Section 31 of the Regulations".

7.2 RECOMMENDATIONS BY THE EAP

It is the professional and objective opinion of the independent EAP that the following is relevant:

- All reasonable actions were taken to identify any relevant environmental components in the study area.
- The specialist input obtained is comprehensive and effective in providing an assessment of the status quo of the study area and potentially sensitive areas and issues of concern and impact that require re-consideration of route alternatives.
- Significant and reasonable actions were taken to identify and notify all I&AP's that include government departments, relevant authorities, general stakeholders and potentially affected landowners of the project. Extensive, continuous and significant communication with the I&AP's took place.
- The Environmental Impact Report includes all proceedings, findings and recommendations from both the Scoping Phase and EIR Phase.
- All relevant legal requirement in terms of the EIR Phase as per the Environmental Impact Assessment Regulations published on 18 June 2010 as per the National Environmental Management Act, 1998 (Act No 107 of 1998) as amended were complied with.

The EAP can without reservation recommend this Environmental Impact Report for Environmental Authorisation by the DEA. It is also requested that Route One Corridor (Preferred) be authorised.

It is recommended that the following are included in the Environmental Authorisation:

- The implementation of the Environmental Management Plan is a condition of authorisation.
- A route corridor width of 2km is approved for the Route One Corridor (Preferred Route). The 55m servitude required by Eskom should be determined in cooperation with the directly affected landowners to accommodate site-specific requirements.
- A Route Walk-down with the Eskom Engineers, the Bird Impact Specialist, the Ecologist, the Freshwater Specialist and the Archaeologist must be undertaken once the draft positions of the pylons had been identified.
