KUDU POWER STATION (PS) – ORANJEMOND 1ST & 2ND 400KV LINES

Scoping & EIA Application

DEA Reference: 14/12/16/3/3/2/977

FINAL ENVIRONMENTAL IMPACT REPORT

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LIST OF ABBREVIATIONS

BID	**Background Information Document**
CBA	**Critical Biodiversity Area**
DEA	**National Department of Environment Affairs**
DEIR	**Draft Environmental Impact Report**
DSR	**Draft Scoping Report**
DWS	**National Department of Water & Sanitation**
DMR	**Department of Mineral Resources**
EA	**Environmental Authorisation**
EAP	**Environmental Assessment Practitioner**
ECO	**Environmental Control Officer**
EIA	**Environmental Impact Assessment**
EIR	**Environmental Impact Report**
EMF	**Environmental Management Framework**
EMP	**Environmental Management Plan/Programme**
EWT	**Endangered Wildlife Trust**
FEIR	**Final Environmental Impact Report**
FSR	**Final Scoping Report**
GNR	**Government Notice Regulation**
ha	**Hectare(s)**
HIA	**Heritage Impact Assessment**
I&AP's	**Interested and Affected Parties**
IEM	**Integrated Environmental Management**
m^3	**Cubic metres**
Mamsl	**Metres above mean sea level**
n/a	**Not applicable**
NEMA	**National Environmental Management Act, 1998 (Act No 107 of 1998)**
NEMPAA	**National Environmental Management: Protected Areas Act, 2003 (Act No 57 of 2003)**
NEMWA	**National Environmental Management: Waste Act, 2008 (Act No 59 of 2008)**
PPP	**Public Participation Process/Programme**
SAHRA	**South African Heritage Resources Agency**
SANBI	**South African National Biodiversity Institute**
SR	**Scoping Report**
PHRA	**Provincial Heritage Resources Authority**
PoS	**Plan of Study**
WULA	**Water Use License Application**

ELECTRICAL TERMS AND ABBREVIATIONS

Eskom SOC	**South Africa's Electricity Supply Commission (A State Owned Company)**
ICNIRP	**International Commission for Non-Ionising Radiation Protection**
IEP	**Integrated Energy Plan**
ISEP	**Integrated Strategic Electricity Planning**
MTS	**Main Transmission System**
NDP	**Network Development Plan**
NERSA	**National Energy Regulator of South Africa**
PV	**Photovoltaic (as in solar panels)**
Voltage :	
kV	**Kilovolt (1kV = 1 000V)**
MVA	**Mega Volt Ampére**
Units of power :	
kW	**Kilowatt (1kW= 1 000W)**
MW	**Megawatt (1MW=1 000kW)**

EXECUTIVE SUMMARY

1. PROJECT OVERVIEW

Eskom Holdings SOC Limited : Group Technology and Commercial is in the process of undertaking major infrastructural investments that includes the "Kudu Power Station (PS)- Oranjemond 1st and 2nd 400kV Lines Project". The main purpose of this project is to integrate the new Kudu 885MW Power Station in Namibia into the Eskom network at the existing Oranjemond MTS Substation in the Alexander Bay area in South Africa. It is proposed in to construct 2 x 400kV powerlines and upgrade the Oranjemond MTS to accommodate these two lines accordingly.

The study area investigated by the project team consisted of a 3km corridor surrounding the existing transmission line and substation. Eskom is responsible for the Orange River crossing where the international border has moved as a result of the river dynamics. The study area therefore extends to the riparian zone on the Namibian side of the river. The distance of the proposed powerline from the substation to the South African side of the Orange River is approximately 800m while the total length of the powerline to the border of the riparian vegetation on the Namibian site is approximately 2km.

The Kudu Power Station (PS)- Oranjemond 1st and 2nd 400kV Lines project involves the following main components:

- The existing Oranjemond MTS Substation would be upgraded and expanded to accommodate the new power lines as follows:
  - Constructing a 400kV yard and equipment including busbar;
  - Installing a 1x 315MVA 400/220kV transformer
  - Create at least 4x 400kV line bays to allow for potential development.
- 2x 400kV power lines would be constructed from the Namibian side of the Orange River across the river to connect to the Oranjemond MTS Substation
- A new access road to the existing Oranjemond Substation site
- The R382 road deviation at the south-east corner of the substation extension
- A two-track service road between the two new powerlines within the servitude.

It is requested that a corridor width of 1km be authorised in which a 90m servitude for the purpose of this powerline will be registered. The servitude width of a 400kV line is 55m for each line – where parallel to each other it will be separated by 35m, with 27,5m on the outside - the total width of the powerline servitude required for this project for the two lines together is therefore 90m. This will enable reasonable adjustments within the corridor during the walk-down and servitude negotiations with the relevant landowner without having to enter into an additional environmental authorisation process.

2. LEGAL REQUIREMENT

The construction of a 400kV power line 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 (amongst other relevant activities) environmental authorisation is required from the Department of Environmental Affairs (DEA). Eskom has appointed Landscape Dynamics Environmental Consultants to conduct an Environmental Impact Assessment (EIA) and apply for Environmental Authorisation for this project.

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

- GN 983, Dec 2014, Numbers 12; 19; 24; 27 and 47
- GN 984, Dec 2014 Listing Notice 2, Number 9
- GN 985, Dec 2014 Listing Notice 3, Number 4, 12 and 14

A Scoping & Environmental Impact process is required. The Scoping Report was approved by DEA on 17 January 2017. This document is the Environmental Impact Report (EIR) of this full EIA process. According to the NEMA 2014 Regulations, Appendix 3, an EIR must contain all the information that is necessary for the competent authority to consider and come to a decision on the application.

An independent legal review of the Draft EIR is being done to confirm that the requirements of the Environmental Impact Report had been met.

Specialist investigations informed that authorisation is also required in terms of the National Water Act and the Cape Nature Conservation Ordinance. This does not form part of the application for Environmental Authorisation, but the requirements of the regulating authorities must be fulfilled prior to commencement of construction as will be specified in the Environmental Management Plan.

- <u>The National Water Act, 1998 (Act Nr 36 of 1998)</u>
  The applicant is required to obtain a Water Use License or General Authorisation for the activity from the regional office of DWS. The relevant listed activities are :
  - Section 21 (c) Impeding or diverting the flow in a watercourse
  - Section 21 (i) Altering the bed, banks, course or characteristics of a watercourse

- <u>National Forests Act (No 84 of 1998) &National Veld and Forests Fires Act (Act 101 of 1998)</u>
  The Northern Cape Department of Agriculture, Forestry & Fisheries administers permits for the protection of threatened and/or endangered species.

3. SPECIALIST INVESTIGATIONS

The specialist studies undertaken and the key findings and issues are supplied under the relevant headings below. Detail information is supplied in Chapter 4 and the complete reports are provided in Appendix C of the EIR. The details of the specialists (expertise, curriculum vitae's and declarations of independence) were included in Appendix E(2) of the Final Scoping Report and are not again supplied in the EIR, but are available on request**.**

Key findings of the specialist studies

Geology, Groundwater and Agricultural Aspects

Geology

- The Gariep Supergroup is generally composed of low grade, metamorphosed volcanic sedimentary successions intruded by syn- to post orogenic granitoids. They have been extensively deformed by folding and faulting at times of orogeny activity.
- Moderately hard rock appears from surface as outcrops and sub outcrops.
- The underlying rocks can be expected to be thinly laminated owing to their lava flows, and with discontinuities caused by the tectonic activity with the rock having being folded and faulted and could be moderately jointed.
- The Weinert N rating (an indication of the main weathering mode from mechanical to chemical weathering) for the area is high in correlation to its arid nature. This indicates that the rocks dominate mode of weathering is subject mostly to mechanical weathering rather than chemical weathering.

Soils

- In areas away from the Orange River thin transported windblown soils (Aeolian) occur from surface comprising mainly yellowish brownish silty sands. They are largely absent around the substation site but the depths of these soils appear significantly across the steeper terrain and on the wind leeward side near the river. These soils may be considered to be loose in nature and unconsolidated.
- Alluvial soils occur within the Orange River flood plain. They are typically finer in nature comprising silts and clays. A relative shallow residual soil profile is expected.

Ground and surface water

- Recharge of groundwater is limited, occurring in small quantities being restricted by the limited rainfall and generally hard geological formations. Aquifer characteristics would thus typically be expected to be unfavourable.
- There is also little potential for surface water to pond on the site providing little capacity for any ground water recharge from surface there.
- In the area abstraction can easily be done from the Orange River therefore the need for boreholes around the site is minimal.

Agricultural Aspects

- As the area has little precipitation with sparse natural vegetation very difficult conditions are presented for being able to carry out agricultural activities in an economical manner within the sites limited area.
- The Richtersveld Sida Hub Communal Property Association (CPA) currently uses a portion of land upstream of the project site for sheep and goat grazing purposes with limited irrigation activities confined to the limited floodplain area.
- The project development site provides very limited and remote potential for pastoral activities. The flood plain is restricted along the proposed powerline route and little potential exists should the area be developed with irrigating from water supplied from the Orange River.

Aquatic and Riparian Area Impact

- The Orange River is in a largely modified ecological state with a high ecological importance and sensitivity.
- There must be no further deterioration in river condition for this section of river.
- Potential impact (mostly during construction)
  - Direct modification or loss of aquatic habitat
  - Potential flow impact
  - Water quality impact
- The pylons would be constructed within the recommend buffer but not within any of the mapped riparian zone (as per Appendix C(2)(b).
- Water Use Authorisation in terms of the National Water Act (Nr 36 of 1998) is required for the crossing of the river. The Risk Assessment Matrix provided by the Department of Water and Sanitation was used in the assessment of the risk posed to the aquatic ecosystems by the proposed project. It was concluded that the proposed activities pose a **low risk** to the aquatic ecosystems for both the Construction and Operational & Maintenance Phases of the project.
- The regulation relating to General Authorisations for Section 21 (c) and (i) water uses has been revised so that General Authorisation in terms of the Water Act could therefore be relevant to this project because of the low risk rating.

Vegetation Impact

- The study area on the northern side of the Orange River is classified as an Ecological Support Area (ESA) and the section of the study area on the South African side of the Orange River is classified as a Critical Biodiversity Area (CBA) Type 2.
- There are three vegetation types present in the study area:
  - Western Gariep Lowland Desert (Dn4);
  - Lower Gariep Alluvial Vegetation (Aza3)
  - Arid Estuarine Salt Marshes (AZe1).
- Two vegetation units had been described :-
  - The desert area
    - Lowland section
    - Rocky Section
  - Riverbank area
- Impact associated with powerlines :-
  - Loss of natural vegetation
  - Habitat fragmentation (loss of landscape connectivity)
  - Impacts on vulnerable species

    - Establishment of invasive plants and declared weeds
    - Destruction of rocky vegetation where the new substation will be constructed
- The results of the impact evaluations done by the ecologist for vegetation units 1 and 2 shows that the proposed power lines should have **no severe (high) impact** on the different units with **medium-low** impacts over the **short-long term**.
- The expansion of the current substation to the east will lead to the destruction of a section of the rocky hill area (unit 1b) that will be permanent. If proper mitigation measures are implemented the effect can however be somewhat mitigated to lessen the impact.
- A site walk-down with the ecologist is required once the pylon positions have been determined.
- A Plant Rescue & Protection Management Plan must be compiled to confirm the permitting requirements of the Northern Cape Department of Environment and Nature Conservation to ensure compliance with the Northern Cape Provincial Act (Act 9 of 2009).

Bird Impact

- The site is located 10km upstream from the Important Bird Area (IBA) - referred to as the Orange River Mouth Transboundary Ramsar Site.
- Three main impacts of powerlines on birdlife are the following :
    - Electrocutions
    - Collisions
    - Displacement due to habitat destruction and disturbance
- Bird flight diverters are proposed on the earth wires and there should be OWL devices (LED lights) for Flamingo's. These devices are fitted with little solar panels with lights that flicker at night.
- With mitigation :
    - Impact resulting from displacement and electrocution will be **low to very low**
    - Impact resulting from electrocution will be **low**.

Paleontological Impact

- The area does not provide good conditions for the preservation of fossils.

Heritage Impact

- No sites of cultural heritage significance were located in the surveyed area.
- Many stone tools have however been noted and the way forward will be determined during site walk-down.

Visual Impact

- Visual issues have not been raised as a major concern by the local community and therefore the sensitivity to the project from this perspective is low.
- The study area already contains a substation and power lines and the proposed new development would be constructed adjacent to these structures. The main impact is therefore of a cumulative nature and was assessed as such.
- During the Construction Phase the proposed Project will exert a **moderate** negative impact (i.e. the impact is real but not substantial) on the visual and aesthetic environment. Mitigation during this phase is possible but it revolves mainly around 'good housekeeping i.e. suppression of dust at the substation site and along access roads during construction.
- The Operational Phase is predicted to exert a **moderate** impact without mitigation.

Mitigation is possible, in the form of a tree screen to the east of the substation, during the operational phase but it will not substantially reduce the cumulative impact of the power lines. It will however screen sensitive views from the east to the sub-station. It also must be noted that the tree screen will not be effective immediately it will have to be established over a number of years before it will effectively contribute to mitigating the visual impact.

- The visual impact specialist concluded that the proposed activity should be authorised with the proviso that the proposed management measures are binding to this authorization.

Key Social Issues

- No objection was received.
- The impact on tourism and land use is not expected to be significant.
- The Richtersveld Sida Hub Communal Property Association (CPA) has a land claim against the property, gazetted on 29 August 2008 (Notice 1049 of 2008). They require continuous liaison with them. It was confirmed that from a legal point of view, nothing is contained in the relevant Act to preclude the Environmental Impact Assessment process to run its course however the notification step to the Regional Land Claims Commissioner is of fundamental importance – this is the responsibility of Eskom being the Applicant.
- Only a few temporary unskilled job opportunities will be created during the construction phase.

4. PUBLIC PARTICIPATION

The Public Participation Process (PPP) followed during the Scoping Phase

Initial Advertising of project (proof is provided under the relevant headings in Appendix D.

- All potential directly and indirectly affected landowners, stakeholders and government departments were identified.
- A Background Information Document (BID) was compiled and distributed via email during the last week of July 2016 to all the stakeholders listed. A 30-day commenting period applied.
- 5x A2 laminated onsite notices were placed in relative close proximity to the site.
- A newspaper advertisement was placed in Die Plattelander on 15 July 2016
- Focus Group Meetings were held with the Richtersveld Local Municipality; the Richtersveld Sida Hub Communal Property Association (CPA) as well as a representative of the landowner of Pico Eco Farm CC.

Distribution of the Draft Scoping Report

The Draft Scoping Report was distributed to Eskom for verification, thereafter to an environmental attorney for legal review as well as to the Department of Environmental Affairs and all registered Interested & Affected Parties for a 30-day commenting period.

Final Scoping Report

Comments received on the Draft Scoping Report (inclusive of the legal review) were incorporated into the Final Scoping Report. The Final Scoping Report was approved by DEA on 17 January 2017.

The Public Participation Process (PPP) followed during the EIR Phase

Public Meeting

A Public Meeting was held in Alexander Bay on 16 November 2016. The objectives of the meeting were

- To communicate the details of the project
- To communicate the proceedings, findings and recommendations of the Environmental Impact Assessment process
- Communicate the findings and recommendations of the specialists
- To enable informed discussion with and comment from stakeholders.

A site visit was also held afterwards. The minutes and attendance register are included in Appendix D of the EIR.

Distribution of the Draft Environmental Impact Report

The Draft EIR was distributed to Eskom for verification, thereafter to an environmental attorney for legal review as well as to the Department of Environmental Affairs and all registered Interested & Affected Parties for a 30-day commenting period.

Comment received on the Draft EIR is addressed in the Final EIR (this document) in paragraph 5.4.3 below. 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 Alternative 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. IMPACT AND MITIGATION

Expected impacts that can be associated with the project are the following:

NEGATIVE IMPACT

Planning Phase:

- Route selection and design:
- Impact on natural habitat (terrestrial fauna & flora)
- Impact on avi-fauna
- Impact on the Orange River

- Visual impact
- Impact on landownership / land claims issue

Construction Phase:

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

During Operational Phase:

- Impact as a result of Eskom inspections and maintenance, i.e. on habitat destruction (pollution, removal of plant species; placement of snares, etc.)
- Risk for collision with birds, specifically across the Orange River.

Cumulative Impacts

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

POSITIVE IMPACTS

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

- This proposed Kudu Power Station (PS)- Oranjemond 1st and 2nd 400kV Lines project provides a transmission solution for the proposed Kudu Gas Power Station in Southern Namibia. The power station will be producing 885MW power that will be evacuated via the NamPower and Eskom Transmission works.
- 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 Kudu-Oranjemond Project planned in a legal, pro-active and structured manner taking all development components, potential and restrictions into account;
- The project will provide some, however limited, employment and training opportunities, during the construction phase of the project development.

A comprehensive Impact Assessment Table that includes proposed mitigation measures are include in Chapter 6, Paragraph 6.3.1.

An Environmental Management Plan that includes all relevant mitigation measures is included in Appendix E of the EIR. It is suggested that the expected negative impact could be mitigated to acceptable levels. It is also suggested that the positive impact outweigh the negative impact associated with the project.

6. CONCLUSION AND RECOMMENDATION

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, identification of impact and the provision of mitigation measures in order to ensure minimal impact on the environment.
- Significant and reasonable actions were taken to identify and notify all Interested & Affected Parties that include government departments, relevant authorities, general stakeholders and affected landowners of the project.
- The Environmental Impact Report includes all proceedings, findings and recommendations from the EIR Phase.
- All relevant legal requirement in terms of the Environmental Impact Report Phase as per the Environmental Impact Assessment Regulations published on 4 December 2014 as per the National Environmental Management Act, 1998 (Act No 107 of 1998) as amended was complied with.

The Environmental Assessment Practitioner recommends without hesitation the proposed Eskom project, the "Kudu Power Station (PS) – Oranjemond 1st & 2nd 400kV Lines'' for Environmental Authorisation by the Department of Environmental Affairs.

It is recommended that the following specific conditions form part of the Environmental Authorisation :-

- The implementation of the Environmental Management Plan provided in Appendix E of the Final EIR must be implemented.
- A site walk-down with the Ecologist and the Heritage Consultant should take place with the Eskom project team once the specific pylon conditions had been determined. A site walk-down report should be compiled and submitted to DEA for record purposes. All reasonable recommendations by the specialists resulting from the site walk-down must be implemented.
- A Plant Rescue & Protection Management Plan must be compiled and implemented.
- An application must be made according to the permitting requirements of the Northern Cape Department of Environment and Nature Conservation to ensure compliance with the Northern Cape Provincial Act (Act 9 of 2009).
- An application for Water Use Authorisation must be made with the Department of Water and Sanitation to ensure compliance with the National Water Act (Nr 36 of 1998).
- It is requested to approve a corridor width of 1km in which a 90m servitude for the purpose of this project will be registered. The servitude width of a 400kV line is 55m for each line – where parallel to each other it will be separated by 35m, with 27,5m on the outside - the total width of the powerline servitude required for this project for the two lines together is therefore 90m. This will enable reasonable adjustments within the corridor during the walk-down and servitude negotiations with the relevant landowner without having to enter into an additional environmental authorisation process.

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CHAPTER 1: INTRODUCTION

1.1 BACKGROUND

Eskom SOC Limited 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 Holdings SOC Limited: Land Development and Management is in the process of undertaking major infrastructural investments that includes the Kudu Power Station (PS)- Oranjemond 1st and 2nd 400kV Lines project. The main purpose of this project is to integrate the new Kudu 885MW Power Station in Namibia into the Eskom network at the existing Oranjemond MTS Substation in the Alexander Bay area in South Africa. It is proposed in to construct 2 x 400kV powerlines and upgrade the Oranjemond MTS to accommodate these two lines accordingly.

The construction of a 400kV power line 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 (amongst other relevant activities) environmental authorisation is required from the Department of Environmental Affairs (DEA). Eskom has appointed Landscape Dynamics Environmental Consultants to conduct an Environmental Impact Assessment (EIA) and apply for Environmental Authorisation for this project.

1.2 OBJECTIVES AND CONTENT OF THE ENVIRONMENTAL IMPACT REPORT

Objectives

According to the NEMA Regulations' Appendix 3, the objective of the environmental impact assessment process is to, through a consultative process

(a) determine the policy and legislative context within which the activity is located and document how the proposed activity complies with and responds to the policy and legislative context;

(b) describe the need and desirability of the proposed activity, including the need and desirability of the activity in the context of the preferred location;

(c) identify the location of the development footprint within the preferred site based on an impact and risk assessment process inclusive of cumulative impacts and a ranking process of all the identified development footprint alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects of the environment;

(d) determine the

(i) nature, significance, consequence, extent, duration and probability of the impacts occurring to inform identified preferred alternatives; and

(ii) degree to which these impacts-

(aa) can be reversed;

(bb) may cause irreplaceable loss of resources, and

(cc) can be avoided, managed or mitigated;

(e) identify the most ideal location for the activity within the preferred site based on the lowest level of environmental sensitivity identified during the assessment;

(f) identify, assess, and rank the impacts the activity will impose on the preferred location through the life of the activity;

(g) identify suitable measures to avoid, manage or mitigate identified impacts;

(h) and identify residual risks that need to be managed and monitored.

Content of the Environmental Impact Report

According to the NEMA 2014 Regulations, Appendix 3, Paragraph 3, the Environmental Impact Report must contain the information that is necessary for the competent authority to consider and come to a decision on the application described. In addition, an EIR must take into account any guidelines applicable to the kind of activity which is the subject of the application. The items are listed below with appropriate reference to the relevant sections in the EIR where the item is addressed.

Regulation requirement	Section in Environmental Impact Report where addressed
(a) details of- (i) the EAP who prepared the report; and (ii) the expertise of the EAP, including a curriculum vitae;	Chapter 1, Paragraph 1.4.1 and Appendix F
(b) the location of the activity, including: (i) the 21 digit Surveyor General code of each cadastral land parcel; (ii) where available, the physical address and farm name; and (iii) where the required information in items (i) and (ii) is not available, the coordinates of the boundary of the property or properties;	Chapter 2, Paragraph 2.2.1 and Appendix A(1)
(c) a plan which locates the proposed activity or activities applied for as well as the associated structures and infrastructure at an appropriate scale, or, if it is- (i) a linear activity, a description and coordinates of the corridor in which the proposed activity or activities is to be undertaken; (ii) on land where the property has not been defined, the coordinates within which the activity is to be undertaken;	Appendix A(2)(a); (b) & (c)
(d) a description of the scope of the proposed activity, including- (i) all listed and specified activities triggered and being applied for; and (ii) a description of the associated structures and infrastructure related to the development;	Chapter 1, Paragraph 1.3.1 and Chapter 2, Paragraph 2.2

(e) a description of the policy and legislative context within which the development is located and an explanation of how the proposed development complies with and responds to the legislation and policy context;	Chapter 1, Paragraph 1.3 and Chapter 7, Paragraph 7.1
(f) a motivation for the need and desirability for the proposed development, including the need and desirability of the activity in the context of the preferred location;	Chapter 2, Paragraph 2.1
g) a motivation for the preferred development footprint within the approved site;	Chapter 3, Paragraphs 3.1 and 3.2
(h) a full description of the process followed to reach the proposed development footprint within the approved site, including:	
(i) details of the development footprint alternatives considered;	Chapter 3
(ii) details of the public participation process undertaken in terms of regulation 41 of the Regulations, including copies of the supporting documents and inputs;	Chapter 5, Paragraph 5.2
(iii) a summary of the issues raised by interested and affected parties, and an indication of the manner in which the issues were incorporated, or the reasons for not including them;	Chapter 5, Paragraphs 5.3.2; 5.3.3 and 5.4.2
(iv) the environmental attributes associated with the development footprint alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;	Chapter 4
(v) the impacts and risks identified including the nature, significance, consequence, extent, duration and probability of the impacts, including the degree to which these impacts- (aa) can be reversed; (bb) may cause irreplaceable loss of resources; and (cc) can be avoided, managed or mitigated;	Chapter 6 , Paragraph 6.3.1
(vi) the methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks;	Chapter 6, Paragraph 6.1
(vii) positive and negative impacts that the proposed activity and alternatives will have on the environment and on the community that may be affected focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;	Chapter 6.2.1 and 6.3.1
(viii) the possible mitigation measures that could be applied and level of residual risk;	Chapter 6, Paragraph 6.3.1 and Appendix E
(ix) if no alternative development locations for the activity were investigated, the motivation for not considering such; and	Chapter 3, Paragraphs 3.1 and 3.2
(x) a concluding statement indicating the preferred alternative development location within the approved site;	Chapter 3, Paragraph 3.4
(I) a full description of the process undertaken to identify, assess and rank the impacts the activity and associated structures and infrastructure will impose on the preferred location through the life of the activity, including-	Chapter 6, Paragraph 6.1 and 6.3.1

(i) a description of all environmental issues and risks that were identified during the environmental impact assessment process; and (ii) an assessment of the significance of each issue and risk and an indication of the extent to which the issue and risk could be avoided or addressed by the adoption of mitigation measures;	
(j) an assessment of each identified potentially significant impact and risk, including- (i) cumulative impacts; (ii) the nature, significance and consequences of the impact and risk; (iii) the extent and duration of the impact and risk; (iv) the probability of the impact and risk occurring; (v) the degree to which the impact and risk can be reversed; (vi) the degree to which the impact and risk may cause irreplaceable loss of resources; and (vii) the degree to which the impact and risk can be mitigated;	Chapter 6, Paragraph 6.1 and 6.3.1
(k) where applicable, a summary of the findings and recommendations of any specialist report complying with Appendix 6 to these Regulations and an indication as to how these findings and recommendations have been included in the final assessment report;	Chapter 4 and Appendix E
(l) an environmental impact statement which contains (i) a summary of the key findings of the environmental impact assessment: (ii) a map at an appropriate scale which superimposes the proposed activity and its associated structures and infrastructure on the environmental sensitivities of the preferred site indicating any areas that should be avoided, including buffers; and (iii)a summary of the positive and negative impacts and risks of the proposed activity and identified alternatives;	Chapter 7 Paragraph 7.2
(m) based on the assessment, and where applicable, recommendations from specialist reports, the recording of proposed impact management objectives, and the impact management outcomes for the development for inclusion in the EMPr as well as for inclusion as conditions of authorisation;	Chapter 7, Paragraph 7.3 and Appendix E
(n) the final proposed alternatives which respond to the impact management measures, avoidance, and mitigation measures identified through the assessment;	Chapter 7, Paragraph 7.3
(o) any aspects which where conditional to the findings of the assessment either by the EAP or specialist which are to be included as conditions of authorisation	Chapter 7, Paragraph 7.2 and 7.3 and Appendix E
(p) a description of any assumptions, uncertainties and gaps in knowledge which relate to the assessment and mitigation measures proposed;	Included in specialist reports where relevant – Appendix C

(q) a reasoned opinion as to whether the proposed activity should or should not be authorised, and if the opinion is that it should be authorised, any conditions that should be made in respect of that authorisation;	Chapter 7, Paragraph 7.2 and 7.3
(r) where the proposed activity does not include operational aspects, the period for which the environmental authorisation is required and the date on which the activity will be concluded and the post construction monitoring requirements finalised;	Not applicable
(s) an undertaking under oath or affirmation by the EAP in relation to: (i) the correctness of the information provided in the reports; (ii) the inclusion of comments and inputs from stakeholders and I&APs; (iii) the inclusion of inputs and recommendations from the specialist reports where relevant; and (iv) any information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested or affected parties;	Chapter 7, Paragraph 7.4
(t) where applicable, details of any financial provisions for the rehabilitation, closure, and ongoing post decommissioning management of negative environmental impacts;	Not applicable
(u) an indication of any deviation from the approved scoping report, including the plan of study, including- (i) any deviation from the methodology used in determining the significance of potential environmental impacts and risks; and (ii) a motivation for the deviation;	Deviation from Plan of Study for PPP of the EIR Phase – Chapter 5, Paragraph 5.3
(v) any specific information that may be required by the competent authority; and	Not applicable
(w) any other matters required in terms of section 24(4)(a) and (b) of Act.	Not applicable

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.982, December 2014. Environmental Authorisation is requested for the following listed activities:

Listing Notice 1	
GN 983, Dec 2014, Number 12 The development of- (i) canals exceeding 100 square metres in size; (ii) channels exceeding 100 square metres in size;	Two approximately 2km new power lines will be constructed and the footprint of the pylons will be 100m^2. Some of the pylon towers will

(iii) bridges exceeding 100 square metres in size; (iv) dams, where the dam, including infrastructure and water surface area, exceeds 100 square metres in size; (v) weirs, where the weir, including infrastructure and water surface area, exceeds 100 square metres in size; (vi) bulk storm water outlet structures exceeding 100 square metres in size; (vii) marinas exceeding 100 square metres in size; (viii) jetties exceeding 100 square metres in size; (ix) slipways exceeding 100 square metres in size; (x) buildings exceeding 100 square metres in size; (xi) boardwalks exceeding 100 square metres in size; or (xii) infrastructure or structures with a physical footprint of 100 square metres or more; where such development occurs- a) within a watercourse; b) in front of a development setback; or c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse; - excluding- (aa) the development of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour; (bb) where such development activities are related to the development of a port or harbour, in which case activity 26 in Listing Notice 2 of 2014 applies; (cc) activities listed in activity 14 in Listing Notice 2 of 2014 or activity 14 in Listing Notice 3 of 2014, in which case that activity applies; (dd) where such development occurs within an urban area; or (ee) where such development occurs within existing roads or road reserves.	be constructed within 32m from the Orange River.
GN 983, Dec 2014, Number 19 The infilling or depositing of any material of more than 5 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 5 cubic metres from- (i) a watercourse; (ii) the seashore; or (iii) the littoral active zone, an estuary or a distance of 100 metres inland of the high-water mark of the sea or an estuary, whichever distance is the greater But excluding where such infilling, depositing , dredging, excavation, removal or moving- a) will occur behind a development setback; b) is for maintenance purposes undertaken in accordance with a maintenance management plan; or c) falls within the ambit of activity 21 in this Notice, in which case that activity applies.	Foundations of 100m^2 (therefore more than 5m^3) will be constructed for the towers and some will occur within 32m of a watercourse (the Orange River).

GN 983, Dec 2014, Number 24 The development of- (i) a road for which an environmental authorisation was obtained for the route determination in terms of activity 5 in Government Notice 387 of 2006 or activity 18 in Government Notice 545 of 2010; or (ii) a road with a reserve wider than 13,5 meters, or where no reserve exists where the road is wider than 8 metres; but excluding- (a) roads which are identified and included in activity 27 in Listing Notice 2 of 2014; or (b) roads where the entire road falls within an urban area.	The existing R382 road will be deviated at the south-east corner of the substation extension .
GN 983, Dec 2014, Number 27 The clearance of an area of 1 hectares or more, but less than 20 hectares of indigenous vegetation, except where such clearance of indigenous vegetation is required for- (i) the undertaking of a linear activity; or (ii) maintenance purposes undertaken in accordance with a maintenance management plan.	The existing 2,5 hectare footprint of the substation site will be enlarged by an additional 4 hectares of land. The site contains indigenous vegetation.
GN 983, Dec 2017, Number 47 The expansion of facilities or infrastructure for the transmission and distribution of electricity where the extended capacity will exceed 275 kilovolts and the development footprint will increase.	The project components for the substation upgrade involve • the construction of a 400kV yard and equipment including busbar and bus coupler bay; • installing a 1x 315MVA 400/220kV transformer • creating at least 4x 400kV line bays to allow for potential development In order to achieve the above, it is required to increase the existing 2,5 hectare footprint of the substation with an additional 4 hectares is required. The final footprint will be 6,5ha.

Listing Notice 2	
GN 984, Dec 2014, Number 9 The development of facilities or infrastructure for the transmission and distribution of electricity with a capacity of 275 kilovolts or more, outside an urban area or industrial complex.	Two approximately 2km 400kV powerlines will be constructed. The expansion of the existing Oranjemond MTS Substation also forms part of the project components. The study area falls outside urban areas and industrial complexes.

Listing Notice 3

The applicable sub-activities are highlighted in grey and a description for the reason of selection is provided in the corresponding column. The SANBI maps (as derived from http://bgis.sanbi.org) which indicate the CBAs, ESAs and Protected Areas are attached under Appendix A.

Listing Notice 3	
GN 985, Dec 2014, Number 4 The development of a road wider than 4 metres with a reserve less than 13,5 metres. (a) In Free State, Limpopo, Mpumalanga and Northern Cape provinces: i. In an estuary; ii. Outside urban areas, in: (aa) A protected area identified in terms of NEMPAA, excluding disturbed areas; (bb) National Protected Area Expansion Strategy Focus areas; (cc) Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority; (dd) Sites or areas identified in terms of an International Convention; (ee) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans; (ff) Core areas in biosphere reserves; (gg) Areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any other protected area identified in terms of NEMPAA or from the core areas of a biosphere reserve, excluding disturbed areas; or (hh) Areas seawards of the development setback line or within 1 kilometre from the high-water mark of the sea if no such development setback line is determined; or iii. In urban areas: (aa) Areas zoned for use as public open space; (bb) Areas designated for conservation use in Spatial Development Frameworks adopted by the competent authority or zoned for a conservation purpose; or (cc) Seawards of the development setback line or within urban protected areas.	• A new access road wider than 4m will be built to the existing Oranjemond Substation site. • The R382 could be deviated at the south east corner of the substation site. It is estimated to involve approximately 4 weeks during the construction phase, but it may not be required at all if the bypass could be accommodated from another turn-off from the main road. A temporary road will need to be graded next to the current road during the deviation upgrade. • The study area on the northern side of the Orange River is classified as an Ecological Support Area (ESA). • The section of the study area south of the Orange River is classified as a Critical Biodiversity Area (CBA) Type 2. • The study area is located approximately 10km upstream from the Orange River Mouth Wetlands Important Bird Area (IBA) (SA 030) This IBA was declared a Ramsar site in 1991, as was the Namibian side of the mouth in 1995. Together they form the Orange River Mouth Transboundary Ramsar Site.

GN 985, Dec 2014, Number 12 The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance plan.	The existing 2,5 hectare footprint of the substation site will be enlarged by an additional 4 hectares of land. The site contains indigenous vegetation.

(d) In Northern Cape: i. Within any critically endangered or endangered ecosystem listed in terms of section 52 of the NEMBA 'or prior to the publication of such a list, within an area that has been identified as critically endangered in the National Spatial Biodiversity Assessment 2004; ii. Within critical biodiversity areas identified in bioregional plans; iii. Within the littoral active zone or 100 metres inland from high water mark of the sea or an estuary, whichever distance is the greater, excluding where such removal will occur behind the development setback line on erven in urban areas; or iv. On land, where, at the time of the coming into effect of this Notice or thereafter such land was zoned open space, conservation or had an equivalent zoning.	The study area on the northern side of the Orange River is classified as an Ecological Support Area (ESA). The section of the study area on south of the Orange River is classified as a Critical Biodiversity Area (CBA) Type 2.
GN 985, Dec 2014, Number 14 The development of- (i) canals exceeding 10 square metres in size ; (ii) channels exceeding 10 square metres in size; (iii) bridges exceeding 10 square metres in size; (iv) dams, where the dam, including infrastructure and water surface area exceeds 10 square metres in size; (v) weirs, where the weir, including infrastructure and water surface area exceeds 10 square metres in size; (vi) bulk storm water outlet structures exceeding 10 square metres in size; (vii) marinas exceeding 10 square metres in size; (viii) jetties exceeding 10 square metres in size; (ix) slipways exceeding 10 square metres in size; (x) buildings exceeding 10 square metres in size; (xi) boardwalks exceeding 10 square metres in size; or (xii) infrastructure or structures with a physical footprint of 10 square metres or more; where such development occurs (a) within a watercourse; (b) in front of a development setback or (c) if no development setback has been adopted, within 32 metres of a watercourse, measured from the edge of a watercourse; excluding the development of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour. (a) In Free State, Limpopo, Mpumalanga and Northern Cape: i. In an estuary; ii. Outside urban areas, in: (aa) A protected area identified in terms of NEMPAA, excluding conservancies; (bb) National Protected Area Expansion Strategy Focus areas; (cc) World Heritage Sites;	Two approximately 2km new power lines will be constructed and the footprint of the pylons will be 100m^2 (will therefore exceed 10m^2). Some towers will be constructed within 32m from a watercourse (the Orange River). The study area is located approximately 10km upstream from the Orange River Mouth Wetlands Important Bird Area (IBA) (SA 030) This IBA was declared a Ramsar site in 1991, as was the Namibian side of the mouth in 1995. Together they form the Orange River Mouth Transboundary Ramsar Site.

(dd) Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority; (ee) Sites or areas identified in terms of an International Convention; (ff) Critical biodiversity areas or ecosystem service areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans; (gg) Core areas in biosphere reserves; (hh) Areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any other protected area identified in terms of NEMPAA or from the core area of a biosphere reserve; (ii) Areas seawards of the development setback line or within 1 kilometre from the high-water mark of the sea if no such development setback line is determined; or iii. In urban areas: (aa) Areas zoned for use as public open space; (bb) Areas designated for conservation use in Spatial Development Frameworks adopted by the competent authority, zoned for a conservation purpose; or (cc) Areas seawards of the development setback line.	

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 in terms of the Environmental Authorisation:

- 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 Northern Cape Provincial Heritage Authority.

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.

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.
The applicant is required to obtain a Water Use License or General Authorisation for the activity from the regional office of DWS. The relevant listed activities are :

Section 21 (c) Impeding or diverting the flow in a watercourse
Section 21 (i) Altering the bed, banks, course or characteristics of a watercourse

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
    - involving three or more existing erven or subdivisions thereof
(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.

National Environmental Management: Protected Areas Act (No 57 of 2003)
The Act came into operation on 01 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.

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.

Northern Cape Nature Conservation Ordinance Act (Act 9 of 2009)

This legislation was developed to protect both animal and plant species within the various provinces of the country which warrant protection. These may be species which are under threat or which are already considered to be endangered. The provincial environmental authorities are responsible for implementing the provisions of this legislation, which includes the issuing of permits etc. In the Northern Cape, the Department of Environment and Nature Conservation fulfils this mandate. 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. Protected species are listed as Schedule 1 (Specifically protected), Schedule 2 (Protected) and Schedule 3 (Common indigenous).

Namaqua District Biodiversity Sector Plan, 2008

Biodiversity sector plans are intended to help guide land-use planning, environmental assessments and authorisations; and, natural resource management in order to promote development which occurs in a sustainable manner. The Namaqua District Biodiversity Sector Plan was developed to

further the awareness of the unique biodiversity in the area, the value this bio diversity represents to people as well as the management mechanisms that can ensure its protection and sustainable utilisation. The biodiversity profile information from this plan has been incorporated into the environmental planning section of the Spatial Development Frameworks (SDF's) for each of the six local municipalities in the district.

The Namaqua District Critical Biodiversity Areas (CBA) has been mapped to include the Richtersveld Municipal area including the study site:

- The study side of the Orange River is classified as an Ecological Support Area (ESA) which is due to it being classified as a terrestrial migration corridor.
- The section of the study area on the South African side is classified as a Critical Biodiversity Area (CBA) Type 2. Level 2 CBA‟s are designated to near-natural landscapes including:
    - Ecosystems and species largely intact and undisturbed,
    - Areas with intermediate irreplaceability or some flexibility in terms of area required to meet biodiversity targets. T
    - There are options for loss of some components of biodiversity in these landscapes without compromising our ability to achieve targets,
    - These are landscapes that are approaching but have not passed their limits of acceptable change.

The ecological impact assessment acknowledges these impacts and confirms that the impact can be mitigated since the affected activities (i.e. overhead transmission line and water pipeline) can be micro-sited to minimise impact. Similarly these activities will be associated with already transformed area (not reflected at CBA/ESA scale) associated with existing 66kV Eskom transmission lines and access routes to the property. The implementation of the Alien Invasive Management Plan and the Plant Rescue & Protection Management Plan will be vital in ensuring that impacts within the areas designated as CBA and ESA are mitigated to within acceptable environmental limits.

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.

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.

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 is the Environmental Consultants appointed 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 20 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 and the Northern Cape.

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 F.

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 is therefore required for this Environmental Impact Assessment.

The EIA Project Team members are the following:

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
Africa Concepts	Mr Chris Groenewald	Geology, groundwater & agricultural aspects

Blue Science (Pty) Ltd	Dr Toni Belcher & Mr Dana Grobler	Aquatic Impact Study
Enviroguard Ecological Services CC	Dr Leslie Brown	Ecological Study (Terrestrial Fauna & Flora)
Chris van Rooyen Consulting	Mr Chris van Rooyen	Avi-Fauna Impact Study
Archaetnos Cultural & Heritage Resource Consultants	Dr Anton van Vollenhoven	Heritage Impact Assessment
Evolutionary Studies Institute, University of the Witwatersrand	Prof Marion Bamford	Palaeontology desktop study
AMP Property Management & Land Acquisition	Ms Anna-Marie Botha Ms Maritha Duvenage	Integrated Report : Social Impact, Socio-economic, Land Use & Tourism
Newtown Landscape Architects	Mr Graham Young	Visual Impact Assessment
Moketla Mamabolo Attorneys	Mr Moketla Mamabolo	Legal Review
Afrimage Photography	Mr Albert Froneman	Mapping and GIS support

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

Division within Eskom Group Capital Division	**Contact Person(s)**	**Responsibility and/or Project Component**
Environment	Ms Rudzani Ranwedzi	Applicant Representative & Environmental Manager
Project Development Engineer	Mr Fick Booysen	Overall Project Management
Land Development: Acquisition	Mr Wimpie Henning	Compensation and Servitude Acquisition
Land Development: Project Planning	Ms Jamila Kombe	Project Planning
Line Engineering Services	Mr Shakir Dudhia	Line Design
Substation Engineering Services	Mr Mark Peffer	Substation Design

1.5 WORKING PROGRAMME

The following programme is pursued in this Environmental Impact Assessment process :

Activity	Planned
Project Management	
Date of Appointment	May 2016
Kick-off meeting with Eskom	May 2016
Date of Site Visit with Overview Site investigation with Eskom and Specialists	19 & 20 July 2016

Advertising (Notification Phase)	
Compilation of General Stakeholder (I&AP) and Landowner List	June 2016

Placement of Onsite Advertisements	July 2016
Placement of newspaper ad	July 2016
Notification letter distributed to IAP's and Landowner List	July 2016

Scoping Phase: Specialist Studies	
Desktop Studies	July 2016
Receive Final Specialist Reports:- • Freshwater Impact Assessment • Geotechnical Overview Investigation • Ecology, Fauna & Flora Assessment • Heritage Impact • Paleontological Desktop Study • Social & Socio-Economic Impact, Landuse & Eco-Tourism • Visual Impact Assessment • Legal review	31 August 2016
Focus Group Meetings with key stakeholders	July
Draft Scoping Report to Eskom for perusal	September 2016
Draft Scoping Report to IAP's and DEA (with the Application) for comment (30day commenting period)	30 Sept to 30 October 2016
Legal Review	30 Sept to 30 October 2016
Final Scoping Report for approval to DEA	11 November 2016
Approval of Scoping Report by DEA	December 2016

Public Meeting /Open Day	
Invitations sent	25 October 2016
Actual Meeting	15 November 2016
Minutes sent out	25 November 2016

EIA Phase	
Draft EIR to Eskom for perusal	January 2017
Draft EIR to IAP's for comment (30 days for comment) and DEA for record	February-March 2017
Communicate Final EIR with IAP's for comment and DEA for record (21 days for comment)- if applicable	March 2017
Final EIR to DEA for consideration of authorisation	End March
Date of acceptance of report by DEA	April
Date Environmental Authorisation issued and received	June-July
Notification to all I&AP's of EA with right to appeal	June-July

CHAPTER 2: PROJECT INFORMATION

2.1 NEED AND DESIRABILITY

A motivation for the need and desirability for the proposed development including the need and desirability of the activity in the context of the preferred location must be supplied.

Eskom and NamPower have been tasked to provide a transmission solution to the proposed Kudu Gas Power Station in Southern Namibia. The power station will be producing 885 MW power that will be evacuated via the NamPower and Eskom Transmission works. The Kudu Power Station is located in Namibia approximately 40km north of the Oranjemond Substation. NamPower is responsible for the environmental authorisation on the Namibian side. Eskom must obtain environmental authorisation for the part of the project situated on the South African side from the Oranjemond Substation (situated north-east of Alexander Bay, adjacent to the Orange River).

Eskom proposes to construct two powerlines across the Lower Orange River and to expand the existing Oranjemond Substation to provide a transmission solution to the proposed Kudu Gas Power Station in Southern Namibia.

There are no further expansions planned in the area after the Oranjemond-Gromis 2nd 220kV (built at 400kV) line is commissioned. This line is a pre-requisite for the Kudu integration.

The following paragraphs illustrates how this proposed project fits in with national planning objectives and policies in terms of energy-related economic development and sustainable environmental impact management.

Energy Policy of the Republic of South Africa, published by the Department of Minerals and Energy (DME) in 1998

Eskom SOC Limited as the South African utility that generates, transmits and distributes electricity must ensure compliance in terms of national requirement and relevant policies. Development within the energy sector in South Africa is guided by the White Paper on the Energy Policy of the Republic of South Africa, 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.

National Development Plan for 2030

The National Development Plan aims to eliminate poverty and reduce inequality by 2030. South Africa can realise these goals by drawing on the energies of its people, growing an inclusive economy, building capabilities, enhancing the capacity of the state, and promoting leadership and partnerships throughout society.

The Commission's Diagnostic Report, June 2011 set out South Africa's achievements and shortcomings since 1994. It identified a failure to implement policies and an absence of broad partnerships as the main reasons for slow progress, and set out nine primary challenges of which the following is relevant to this project: "Infrastructure is poorly located, inadequate and under-maintained".

Given the complexity of national development, the plan sets out six interlinked priorities. Relevant to this project is bringing about faster economic growth.

The National Development Plan makes a firm commitment to achieving a minimum standard of living. Elements of a decent standard of living include the following relevant to this project :

- A more efficient and competitive infrastructure.
- Infrastructure to facilitate economic activity that is conducive to growth and job creation.

An approach will be developed to strengthen key services such as commercial transport, energy, telecommunications and water, while ensuring their long-term affordability and sustainability.

Economic infrastructure: The proportion of people with access to the electricity grid should rise to at least 90 percent by 2030, with non-grid options available for the rest.

National Spatial Development Perspective (NSDP) (Presidency, 2006)

In addition, the National Spatial Development Perspective (NSDP) (Presidency, 2006) is the primary spatial lens through which policymakers view socio-economic development in the country as a whole. It presents wide variety of socio-economic trends emerging in South Africa, and then draws inferences about how that emerging space economy should affect public investment (expenditure) in the immediate future.

Those interpretations and conclusions are, however, guided by a number of normative principles that ultimately steer national infrastructure investment and development decisions. NSDP principles, amongst other are

- Sustained, inclusive and rapid economic growth is a pre-requisite for the achievement of other policy objectives (especially poverty alleviation). Government has a Constitutional obligation to provide basic services (water, electricity, health, education, etc.) to all citizens wherever they reside.

- Beyond the Constitutional obligation identified above, government spending on fixed investment should be focused on localities of economic growth and/or economic potential. This would enable it to leverage in private investment, to stimulate sustainable economic activities and to create long-term employment opportunities.
- One of the Provincial Targets set to ensure attainment of the provincial goals is to increase electricity supply from 83% in 2014 to 90% by 2020.
- Two of the prioritised Implementation Focus Areas are 1) Economic Development and Transformation and 2) Infrastructure Development.

This proposed Eskom Project forms part of the upgrade of various electrical networks in the Northern Cape Province as well as on national level and is therefore in support of above-mentioned goals.

General objectives of Integrated Environmental Management as set out in section 23 of NEMA

The stated objectives of Integrated Environmental Management as set out in Section 23 are to ensure integrated decision-making and co-operative governance so that NEMA's principles and the general objectives for integrated environmental management of activities can be achieved.

The goals are to

a) promote the integration of the principles of environmental management set out in section 2 into the making of all decisions which may have a significant effect on the environment;
b) identify, predict and evaluate the actual and potential impact on the environment, socio-economic conditions and cultural heritage, the risks and consequences and alternatives and options for mitigation of activities, with a view to minimising negative impacts, maximising benefits, and promoting compliance with the principles of environmental management set out in section 2;
c) ensure that the effects of activities on the environment receive adequate consideration before actions are taken in connection with them;
d) ensure adequate and appropriate opportunity for public participation in decisions that may affect the environment;
e) ensure the consideration of environmental attributes in management and decision-making which may have a significant effect on the environment; and
f) identify and employ the modes of environmental management best suited to ensuring that a particular activity is pursued in accordance with the principles of environmental management set out in section 2.

For this project the following actions were taken to reach the general objectives of Integrated Environmental Management as set out in Section 23 of NEMA:

a) Applicable environmental, economic and social aspects have been assessed, thereby ensuring an integrated approach in order to balance the needs of all whom would be affected by this development.
b) Impacts have been described and assessed elsewhere in this report. Mitigation measures have been supplied in order to ensure that all identified impacts are mitigated to acceptable levels. Alternatives have been thoroughly assessed and the best possible solution represents this development proposal.

c) The development proposal has to be evaluated and approved by DEA and no construction may commence prior to the issuing of the Environmental Authorisation.
d) The procedures which were followed during the public participation programme were based on the NEMA EIA Regulations which came into effect on 14 December 2015.
e) DEA will take all information as represented in this report into consideration and may request further information should they feel that further studies/information is required before an informed decision can be made.
f) The mitigation measures as supplied in this report together with the measures as per the Environmental Management Programme are deemed to be the best way to manage anticipated impacts.

By providing electricity whilst not impacting negatively on the environment, the project would contribute to a sustainable environment.

Principles of Environmental Management as set out in Section 2 of NEMA

Chapter 2 of NEMA provides a number of principles that decision-makers have to consider when making decisions that may affect the environment, therefore, when a Competent Authority considers granting or refusing environmental authorisation based on an Environmental Impact Assessment, these principles must be taken into account.

The NEMA principles with which this application conforms are described as follows —

- Environmental management must place people and their needs at the forefront of its concern, and serve their physical, psychological, developmental, cultural and social interests equitably.
- Development must be socially, environmentally and economically sustainable.
- Sustainable development requires the consideration of all relevant factors.

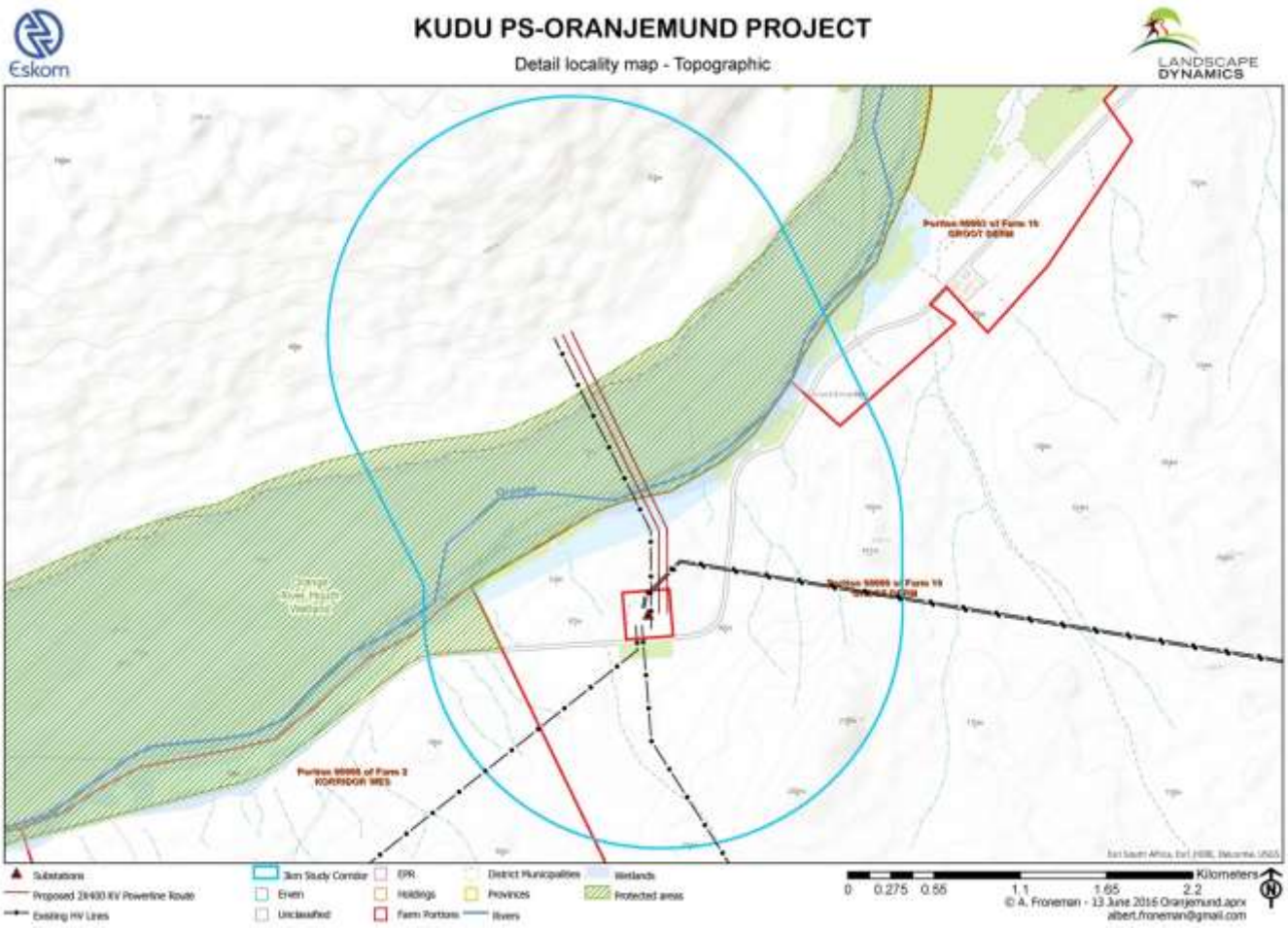
The social, economic and environmental impacts of activities, including disadvantages and benefits, were considered, assessed and evaluated, and informed decision-making by the authority is hereby made possible.

2.2 PROJECT DESCRIPTION

2.2.1 LOCALITY & REGIONAL CONTEXT

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

The study area consists of a 3km corridor surrounding the existing transmission line and substation. The map below is also supplied under Appendix A in A3 size.



The project area is situated on the following properties :

- Remaining Extent of the Farm Grootderm 10, Namaqualand RD (16 204,0182ha), registered landowner Pico Eco Farm CC – site to accommodate the new powerline servitude to be registered
- Portion 4 of the Farm Grootderm 10, Namaqualand RD (9,0003ha), registered landowner Eskom Holdings Ltd – site to accommodate the extension of the existing substation on this land already belonging to the Applicant.

The 21 SG digit codes are :

C	0	5	3	0	0	4	3	0	0	0	0	0	0	1	0	0	0	0	0	0
C	0	5	3	0	0	4	3	0	0	0	0	0	0	1	0	0	0	0	0	4

Eskom is responsible for the construction of the power line crossing the river because the international border has moved as a result of the river dynamics. The study area therefore extends to the riparian zone on the Namibian side of the river. The distance of the proposed powerline from the substation to the South African side of the Orange River is approximately 800m while the total length of the powerline to the border of the riparian vegetation on the Namibian site is approximately 2km.

The site coordinates are provided in Appendix A(2)(c).

2.2.2 PROJECT COMPONENTS AND TECHNICAL INFORMATION

The Eskom Kudu-Oranjemond Project involves the following main components:

- The existing Oranjemond MTS Substation would be upgraded and expanded to accommodate the new power lines as follows:
    - constructing a 400kV yard and equipment including busbar;
    - Installing a 1x 315MVA 400/220kV transformer
    - Create at least 4x 400kV line bays to allow for potential development.
- 2x 400kV power lines would be constructed from the Namibian side of the Orange River across the river to connect to the Oranjemond MTS Substation
- A new access road to the existing Oranjemond Substation site
- The R382 road deviation at the south-east corner of the substation extension
- A two-track service road between the two new powerlines within the servitude.

Oranjemond MTS Substation

The footprint of the existing substation site is 2,5ha. An additional 4 hectares is required. The final footprint will be 6,5ha.

- The extension is planned to take place towards the east. This will involve the demolishing of the current building on that section of the land, as well as the removal of the sand ridge towards the east.
- A balanced cut to fill platform is planned to be created for the development at the substation. This is expected to be limited to approximately 2.5 ha that is required for the substation and the further 4.0 ha for the future bay extensions on the eastern side of the substation site.
- There is already an existing microwave tower – an additional telecommunication tower is not required for the purpose of this project.
- Lights do exist at the site, but they are used when operating and are not permanently on. Towers of approximately 24m would be erected for lighting and security purposes for the new extension. These lights will be fitted building; access control; a workshop; a cladded store; a consumable store; and the existing building will be fitted with a new rood and the asbestos will be disposed of.
- The main access to the substation site will change.
- Consideration will be given to the current sand-screen effect provided by the line of trees east of the provincial road. The tree lane will have to be increased to prevent unnecessary sand on the increased area of the substation site.
- The entire site will be fenced in with a security fence and only controlled access would be allowed.

2 x 400kV Powerlines

Eskom is responsible for the river crossing of the river– the international border has moved as a result of the river dynamics and the study area extends to the riparian zone on the Namibian side of the river. From initial profiles indications are that the maximum span could possibly be 950m. There will however be no tower inside the river, but the regulated area of the Orange River would

probably be affected. The total length of the powerlines will be approximately 2km.

Two different tower structures are being considered for this project :

- Self-Suppporting "518 H" - Top width 23,4m; total base width 8,95 meters
- Angle Strain Tower Type '518 C" – Top width 22,32m; total base width 9,629m

Three different foundations types are considered :

- Column & Pad Foundation 560cm X 560cm
- Rock Anchor Column Pad Foundation 250cm X 250cm
- Sugar Cane Tower Pad Foundation 300cm x 300cm

The foundation footprint for each pylon will involve 100m^2.

The final pylon structure will however only be determined during the design phase. The choice of pylon structure will mostly be guided by the site-specific characteristics in terms of geology and topography.

The existing 66kV powerline across the river has been constructed on transmission type pylons because of the significant length required across the river.

The two new powerlines will cross the existing 66kV line that runs in a north-easterly direction toward the villages upstream of the project area. This line is placed on wooden poles.

Access Roads

- The main access to the substation site will change.
- The R382 could be deviated at the south east corner of the substation site. It is estimated to involve approximately 4 weeks during the construction phase, but it may not be required at all if the bypass could be accommodated from another turn-off from the main road. A temporary road will need to be graded next to the current road during the deviation upgrade.
- One single jeep track road is required in between the two new powerlines to serve both lines, keeping in mind that trucks cannot make a 90° turn in sandy conditions.

2.2.3 SERVITUDE DETAILS

The servitude width of a 400kV line is 55m for each line – where parallel to each other it will be separated by 35m – with 27,5m on the outside. The total width of the powerline servitude required for this project for the two lines together is therefore 90m. The study area within a 3km corridor investigated enables reasonable adjustments within the corridor during the corridor walk-down and servitude negotiations with the relevant landowner without having to enter into an additional environmental authorisation process.

After the agreement had been finalised; the servitude will be registered against the property 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 generally 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.

Often a high water table will require dewatering of the excavation (this could be possible in the regulated area of the Orange River). 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 stubs are placed in the centre of the foundation and 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.

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 the Orange River and will take place strictly 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

Construction is expected to take approximately 30 months for the substation and 4-5 months for the powerline 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 and 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**: An area of approximately 200m x 200m would be required as a lay-down area with a construction site office. A possible site is proposed next to the tree barrier outside the substation site. The specific area 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.
- **Commencement of Construction:** It could be some time before construction can commence, since it is also dependent on the working programme of Nampower on the Namibian side of the river.
- **Accommodation for labourers :** Workforce will be accommodated in the nearest town or village. Only guarding personnel will be allowed to be accommodated on the construction site.

- **Vegetation clearance**: Because of vegetation type occurring along the proposed powerline route, minimal vegetation clearance would be required for the purpose of both the construction and the operational phases. This will be confirmed during the walk-down phase.

CHAPTER 3: ALTERNATIVES

POSSIBLE ALTERNATIVES THAT ARE NOT APPLICABLE TO THIS PROJECT AND WERE NOT ASSESSED

Type of alternative	Motivation
Type of activity to be undertaken	The main purpose of this project is to integrate the new Kudu 885MW Power Station in Namibia into the Eskom network in South Africa. It is therefore required to distribute the electricity from the Kudu Power Station to the existing Oranjemond MTS Substation via transmission power lines. In order to accommodate this additional load of electricity, the substation has to be upgraded. The only way electricity can be transmitted and distributed is via a network of power lines and substations. *There is therefore no activity alternative for the transmission and distribution of electricity and it is therefore not assessed as part of this project.*
Design and/or layout	The design and layout of the substation within the proposed footprint is done strictly according to Eskom's technical and operational requirements. 400kV power lines are always lattice structures (comparing to the option of monopole designs within smaller distribution network). The detail design and layout of the different substation components and the final design of the lattice structures is done by highly qualified Eskom engineers and do therefore not form part of this EIA process. *The different alternatives in terms of the direction of the extension of the substation are however assessed in the paragraph below under the heading ASSESSMENT OF ALTERNATIVES, subheading SUBSTATION EXPANSION SITE ALTERNATIVE.*
Property on which or location where the activity is proposed to	The electricity as received from the Kudu Power Station in Namibia has to feed into the Eskom grid in South Africa. Eskom and NamPower determined together that the existing Oranjemond MTS Substation will be the most logical and cheapest option to receive the electricity and to distribute the electricity further into the wider Eskom network.

be undertaken	In in order to establish receiving and distributing capacity for the additional load as received from Namibia, the most logical option is to expand the existing substation, thereby using existing infrastructure such as roads and using the existing electricity distribution network emanating from the existing substation. Future electrical infrastructure is also planned to receive electricity from the Oranjemond Substation. *To construct a new substation on a different property in a different location was therefore not further assessed as part of this EIA process.*
Route Alternatives	The proposed route for the 2x 400kV power lines is planned to run parallel and adjacent to the existing 66kV powerline that crosses the Orange River. This decision is motivated as follows: • This is the shortest route between the Kudu Power Station and the Oranjemond Substation; therefore it is the cheapest option. This power line route on the Namibian side of the Orange River was determined during the EIA processes as per the Namibian legislation. The power line in this project connects to this route. • The substation will be extended to the east of the existing substation (see the assessment in the table below) which by default guides the position of the new power lines. The power lines therefore have to be constructed to the east of the existing 66kV power line. • The extension of the substation will allow for the lines to enter the site from the northern side of the substation. • Being the shortest route, it will also result in less impact on the Orange River. The proposed crossing will take place within the corridor where the mapped river channel and riparian zone does not exceed 950m. This would imply that the pylons would be located within the recommended buffer but not within any of the mapped riparian areas. • There is already an existing visual impact because of the existing 66kV line; which lessens visual intrusion to some extent. • With the implementation of mitigation measures and plant rescue plans in place, it would be acceptable from an ecological point of view. *The proposed powerline corridor is the logical, obvious and preferred alternative from a technical, economic and environmental viewpoint as illustrated above. The proposed route corridor has the support of all the specialists on the project team. To further assess additional route alternatives was therefore not considered a logical option.*

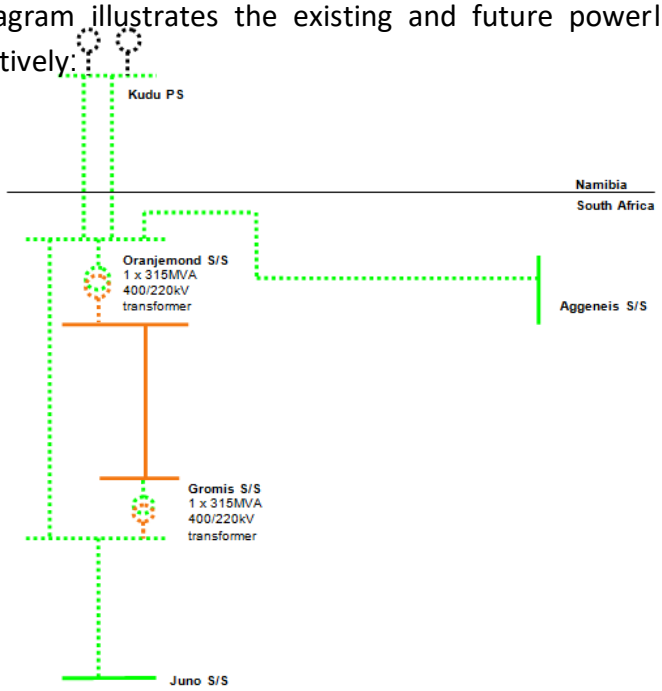
SUBSTATION EXPANSION SITE ALTERNATIVE

The Oranjemond MTS Substation is an existing facility. The expansion is however required to accommodate the new 2x 400kV power lines as well as other possible future lines due to an envisioned increase in demand. The project components for the substation upgrade involve

- the construction of a 400kV yard and equipment including busbar and bus coupler bay;
- installing a 1x 315MVA 400/220kV transformer
- creating at least 4x 400kV line bays to allow for potential development

In order to achieve the above, it is required to increase the existing 2,5 hectare footprint of the substation with an additional 4 hectares. The final footprint will be 6,5ha. The extension is planned to take place towards the east. This will involve the demolishing of the current building on that section of the land, as well as the removal of the sand ridge towards the east. A balanced cut to fill platform is planned to be created for the development at the substation.

The following diagram illustrates the existing and future powerlines that enter and exit the substation respectively:



Consideration from a **technical point** of view was given to the expansion of the footprint in all directions, as follows:

Proposed direction, towards the east

The existing Oranjemond-Aggeneis 66kV powerline leaves the substation towards the north and then turn towards the east. The expansion of the substation to the east will not affect this existing line. At present no other line exits along the eastern side which makes expansion towards the east a viable alternative. The recently approved Richtersveld Project requires the construction of a 132kV powerline and entry to the substation from the eastern side.

Consideration of expansion towards the north,

As described above, the existing Oranjemond-Aggeneis 66kV powerline leaves the substation towards the north. There is also an existing 66kV powerline that leaves the substation from the northern side and crosses the Orange River towers Namibia. Expansion of the substation to the north is therefore not possible.

Consideration of expansion towards the south

This is not possible because there is an existing gravel road, the R382 that runs south and parallel to the substation. Extension in this direction is not possible.

Consideration of expansion towards the west

Expansion to the west was not considered as the line entries are coming in from the north and expansion to the west would mean several line crossings which are not feasible or technically viable.

Substation expansion site as preferred by the specialists

The specialists studies conducted for this project are

- Geology, Groundwater & Agricultural Aspects
- Aquatic Impact Study
- Ecological Study (Terrestrial Fauna & Flora)
- Avi-Fauna Impact Study
- Palaeontological Impact Assessment
- Heritage Impact Assessment
- Social Impact Assessment
- Visual Impact Assessment

Except for the Ecological Study, all of the specialists concluded that there is no specific preference in terms of the position of the proposed substation expansion.

From an *ecological point of view* however it was requested to consider expanding the substation towards the west instead of the east. Expanding to the east will result in the destruction of a sandy / rocky ridge of approximately 1,4ha in extent and this will result in a loss of plant species. It would be preferred from an ecosystem point of view that the ridge area is not developed. However, as confirmed above, expansion to the west is not technically viable because of the line entries coming in from the Namibian side on the north.

Since it is not viable from a technical point of view to expand the substation towards the west; it would therefore be required to implement mitigation measures to limit the ecological impact of the expansion to the east. A Plant Rescue & Protection Management Plan must be implemented prior to construction to relocate the affected sensitive plant species to other suitable areas. The impact

would be moderate (as concluded by the ecologist), which means that the affected environment would be altered, but natural, social and cultural functions and processes could continue albeit in a modified way.

This issue of the extension of the substation site towards the east had been communicated on site with the Northern Cape Department of Environment and Nature Conservation, (represented by Mr Peter Cloete from the District Ecologists Research and Development Support Section) as well as the Department of Agriculture, Forestry and Fisheries, Directorate: Forestry Management, (represented by Ms Jacoline Mans on behalf of the Chief Forester: NFA Regulation). No objection from these key stakeholders in this regard was received.

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, it will not be possible for Eskom to fulfil the customer requirement of integrating electricity from the Nampower Power Station with the Eskom network in South Africa.

Furthermore, the substation is an existing facility. By not expanding as would be the case if the project does not go ahead, this structure would not be optimally utilised.

If this alternative is implemented then future development and demand in the macro area could not be met.

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

3.4 CONCLUSIVE STATEMENT IN TERMS ALTERNATIVES

From the above information supplied, it is clear that the proposed preferred project alternatives for the project investigated within the 3km corridor are the most viable from both a technical and environmental viewpoint whilst meeting the objectives of the mandate of Eskom SOC Limited as the South African utility to generate, transmit and distribute electricity in compliance with national requirement and relevant policies.

It is the considered opinion of the EAP that to assess additional alternatives which are for obvious reasons not preferred only for the sake of providing alternatives should not be required for this project.

CHAPTER 4: STATUS QUO OF RECEIVING ENVIRONMENT

4.1 GENERAL DESCRIPTION OF STUDY AREA

The macro study area falls within the Desert Biome of South Africa. The plant species richness and diversity of the desert is very high compared to other deserts in the world. The diversity of the study area is regarded as moderate compared to that of the Richtersveld.

The study area has a Mediterranean climate and falls within the winter rainfall area of South Africa. The climate of the area is classified as being a "desert" area with a total annual rainfall of between 20mm and 48mm. In addition to the rainfall the area is known known for its morning fog. Fog can provide an important fraction of the annual water and nutrient accumulation needed for ecosystem functioning. Fog carries nutrients that are deposited into the soil. Fog frequency is estimated to be between 50 and 60 days a year.

The annual average daily temperatures range from 19°C in July to 22°C in January. The region is the coldest during June, July and August when the temperature can drop as low as 8°C. The warmest months are from November to April.

The area is known for its strong winds. The average wind speed for the area is 15 km/h with the strongest winds experienced from October to February. Wind speeds of more than 70 km/h have been experienced in the area.

Maps show the substation site to be ±800m from the southern banks of the Orange River. The powerline however extends from the substation ±1,700m to the northern bank on the Namibian side of the river. There is a difference in elevation of about 60m between the proposed substation site and the Orange River with a change of elevation of only about 10m over the first 500m or so. A further 50m change in elevation occurs over the remaining 300m with a steep gradient down to the river. The natural gradient on the northern side of the Orange River is more gradual.

Surface water off the site is channelized in defined path ways to the Orange River. This relief contains the Orange River in a well-defined flood plain area.

The area away from the river is sparsely vegetated typical to an arid terrain with a thin windblown sand covering with sub outcrop and rock outcrops present. Greater vegetation appears in the narrow riparian band on the banks of the Orange River concurrent with the floodplain there.

The Orange River and its associated plains occur to the north of the sub-station and flows from north east to west across the study area. Tall trees (mostly Eucalyptus) occur along the southern banks of the river.

Approximately 3 to 5km to the east of the project site is the Beauvallon Village and its associated farm and residential units. Formalised agriculture (lands under central pivot irrigation) occurs to the far east of the village and the study area. The rolling hills and plains to the south and east of the project site are used as grazing lands by sheep and goats.

The main infrastructure activity is the various power lines that connect with the Oranjemond sub-station. These radiate out to the north across the Orange River and the east, south and west across the study area. At the far western edge of the study area is the Alexander Bay Aerodrome.

The main road (gravel) is the R382, which runs immediately south of the sub-station site and roughly parallels the Orange River. A number of tracks traverse the southern section of the study area.

Tourism in the area is limited to mostly people passing through the area to the Richtersveld (approximately 50km from the study site). However, there is a guest house (Spogplaas B&B) to the immediate east of the site (approximately 1 km) on the R382. Two camp grounds also occur within the vicinity; the Pachtvlei Camping Site, west of the Oranjemond SS and the CPA camp site at the far western edge of Beauvallon Village.

4.2 BIOPHYSICAL ENVIRONMENT

4.2.1 GEOLOGY, GROUNDWATER & AGRICULTURAL ASPECTS

A Geology, Groundwater & Agricultural Aspects Report was compiled by Africa Concepts (Pty) Ltd and is attached under Appendix C(1). A summary thereof follows below.

SOILS AND GEOLOGY

- *Residual Soils and Rock*
  Available geological plans show the greater area to be underlain by the Gariep Supergroup within which the general geology that relates to the project area may be broadly defined as follows.

  In terms of the South African stratigraphic record the Namibian Era and Cambrian Period are represented by these rocks with those of the Richerstveld Suite and the Nama and Vanrhynsdorp Group that are located east and south respectively, all being north of latitude 32°S.

  The Gariep Supergroup is generally composed of low grade, metamorphosed volcanic sedimentary successions intruded by syn- to post orogenic granitoids. They have been extensively deformed by folding and faulting at times of orogeny activity. These major

tectonic activities have resulted in discontinuity with the forming of the so called Marmora Terrane and other geological sequences of the area.

Moderately hard rock appears from surface as outcrops and sub outcrops. The underlying rocks can be expected to be thinly laminated owing to their lava flows, and with discontinuities caused by the tectonic activity with the rock having being folded and faulted. These rocks may expect then to be highly through to moderately jointed.

The Weinert N rating, an indication of the main weathering mode from mechanical to chemical weathering, for the area is high in correlation to its arid nature. This indicates that the rocks dominate mode of weathering is subject mostly to mechanical weathering rather than chemical weathering. Corresponding to this, a relative shallow residual soil profile may be expected.

- *Transported Soil*
  In areas away from the Orange River thin transported windblown soils (Aeolian) occur from surface comprising mainly yellowish brownish silty sands. They are largely absent around the substation site but the depths of these soils appear significantly across the steeper terrain and on the wind leeward side near the river. These soils may be considered to be loose in nature and unconsolidated.

  Alluvial soils occur within the Orange River flood plain. They may typically be expected to be finer in nature comprising silts and clays with being cohesive in nature resulting from river sediments over time.

- *Fill*
  It may be expected that the area has been disturbed in localised places. Typically this may have arisen from some of the following prior activities that could have occurred across the site: Agricultural, Diamond mining, Road works and Infrastructure development.

  These activities are expected to have occurred to a limited extent from which variable and unconsolidated fill may occur in an unconsolidated manner.

GROUND WATER

It is recognised that ground water is of major importance in the area as this may be the only source in many areas away from the Orange River. In the surrounding and remote areas ground water use typically would mostly be limited to rural domestic and stock watering use. Recharge of groundwater is generally limited, occurring in small quantities with being restricted to the limited rainfall and generally hard geological formations. Aquifer characteristics (borehole yields and storage of groundwater) would thus typically be expected to be unfavourable. There is also little

potential for surface water to pond on the site providing little capacity for any ground water recharge from surface there. Thus the potential for perched water tables to develop as well may be considered to be minimal.

No boreholes were observed on site or noted. In the area abstraction can easily be done from the Orange River and the need for boreholes around the site would be minimal. It may also be expected that the ground water is closely related to the level of water encountered in the Orange River. This is some 60 m below the level of the substation where any groundwater can be expected.

AGRICULTURAL

Generally, from a land use perspective and as may relate to surface water management, the area mostly still remains under natural sparse vegetation. As the area has little precipitation with this sparse natural vegetation very difficult conditions are presented for being able to carry out agricultural activities in an economical manner within the sites limited area.

The Richtersveld Sida Hub Communal Property Association (CPA) currently uses a portion of land upstream of the project site for sheep and goat grazing purposes. This would be under irrigated conditions within paddocked off areas. These are however located beyond the power line route and away from the substation. It is seen that the remaining portions of the site provides a very limited and remote potential for pastoral activities.

The flood plain is restricted along the proposed powerline route and little potential exists should the area be developed with irrigating from water supplied from the Orange River. This is seen with the CPA limiting their irrigation activities in an area upstream generally confined to the limited floodplain area upstream.

EXPECTED IMPACTS

Also refer to Chapter 6 where impacts are assessed and mitigation measures provided.

Construction Phase

Impact on the Geology

Foundation excavations will be required for the project at the time of construction and these subsurface activities could affect the geology.

Impact on Ground Water

Potential external sources of water to be considered during the construction phase include water for drilling muds, should piling or anchors be required, moisture conditioning for earthworks compaction control, dust control, some minor workforce ablution requirements and potable water

for the workforce. These are expected to be of limited quantity. Except for these a dry operation is essentially envisaged without requiring any further external water sources for the construction. As the area is greatly a rainfall deficient area ground water is not expected to be affected with the construction.

Impact on Agricultural
There are very restricted agricultural activities on the site, with it being limited to a pastoral nature. Construction activities will be restricted to demarcated and restricted areas thus mostly avoiding interfacing with agricultural activities. The impact is considered to be minor, unlikely, unknown and transient during the construction period.

Operational Phase
The operational phase will extend ongoing over nearly all of the time for the project. Expected negative impacts over this period may be the least as considered below and may most effectively be managed.

Impact on Geology and Soils
No further impacts on the geology or soils are anticipated during the operational phase.

Impact on Ground Water
Except for ongoing ablution facilities no external source of water is required for the operation.

Impact on Agriculture
No further impacts on the agricultural value of the land are anticipated during this phase.

4.2.2 AQUATIC ECOLOGICAL IMPACT ASSESSMENT

An Aquatic Ecological Impact Assessment was undertaken by BlueScience CC and is attached in Appendix C(2). A summary thereof is provided below.

AQUATIC FEATURES
The main aquatic feature within the study area is the lower Orange River and its associated salt marsh wetland areas. The Orange River Estuary is located approximately 10km downstream of the study area. The head of the estuary is defined to be at the Sir Ernest Oppenheimer Bridge approximately 9.5km from the river mouth. The Orange River Mouth is a designated Ramsar site, an internationally protected wetland that consists largely of saline marshes which provide valuable habitat for waterbirds. Large dams built in the Orange River's upper reaches, surrounding land use activities (in particular the mining activities adjacent to the mouth) and an associated increase in salinity have resulted in modified aquatic habitat in these lower reaches with a loss of many of the more sensitive estuarine biota, including migratory waterbirds. Since 1995, because of this loss of

the saline marshes, the area has been placed on the so-called “Montreux list” of endangered wetlands.

The lower Orange River and estuary upstream of the Ramsar site and within the study area is characterised by a braided river channel with sand bars that provide shallow habitat for biota. The estuary is river dominated even in low flow conditions and receives little to no tidal influence upstream of the Sir Ernest Oppenheimer Bridge. The lack of marine influence in the estuary results in a low species richness and biomass from an estuarine point of view. The aquatic habitat associated with the river is particularly important considering the surrounding arid areas.

Small drainage features also drain the hillside south of the lower Orange River at and adjacent to the corridor for the proposed powerlines. These features seldom contain water and do not provide any aquatic habitat of significance. They simply provide a conduit for water draining the steep bank south of the Orange River. Flow in the drainage lines will only occur for short periods of time immediately flowing rainfall events that are likely to be very infrequent considering the low rainfall in the area. They do not appear to drain into the river.

Protected Areas

In terms of Freshwater Ecosystem Biodiversity Areas, the lower Orange River has been identified as a Phase 2 River Freshwater Ecosystem Priority Area that should be rehabilitated if necessary to meet aquatic biodiversity targets. There should be no further deterioration in river condition for this section of river. The Orange River Estuary and associated wetland area in the lower river have been mapped as a FEPA wetland area.

AQUATIC ECOSYSTEM ASSESSMENT

The purpose of the aquatic ecosystem assessment is to determine the relative importance, sensitivity and current condition (ecological state) of the aquatic features concerned in order to assess the impact of proposed development activities on the freshwater resources. The

assessment is also required to make recommendations in terms of mitigation measures that can be used to prevent or minimise the impact on the freshwater resources.

Orange River Estuary Health and Ecological Importance

The overall health score of 56 translates into a Present Ecological Status of a D+, which is classed as a largely modified system. The estuary has been identified as a high priority estuary in need of rehabilitation.

Lower Orange River

- Habitat Integrity

  The evaluation of Index of Habitat Integrity (IHI) provides a measure of the degree to which a river has been modified from its natural state. This assessment was undertaken for the lower Orange River at the corridor for the proposed powerlines.

  Both the riparian and instream habitat integrity of the Orange River can be described as moderately modified. This is the result of flow modification, water quality changes and vegetation removal that have taken place in the entire catchment.

- Ecological Importance and Sensitivity (EIS)

  The EIS assessment considers a number of biotic and habitat determinants surmised to indicate either importance or sensitivity.

  The lower Orange River is considered to be of a high ecological importance and sensitivity. This is due to the fact that it is directly upstream of the Orange River Mouth Ramsar site and the aquatic habitat associated with the river is particularly important in providing refuge in an arid area. The lower river also provides habitat for a number of endemic and rare and endangered biota species.

AQUATIC ECOSYSTEM CONSTRAINTS

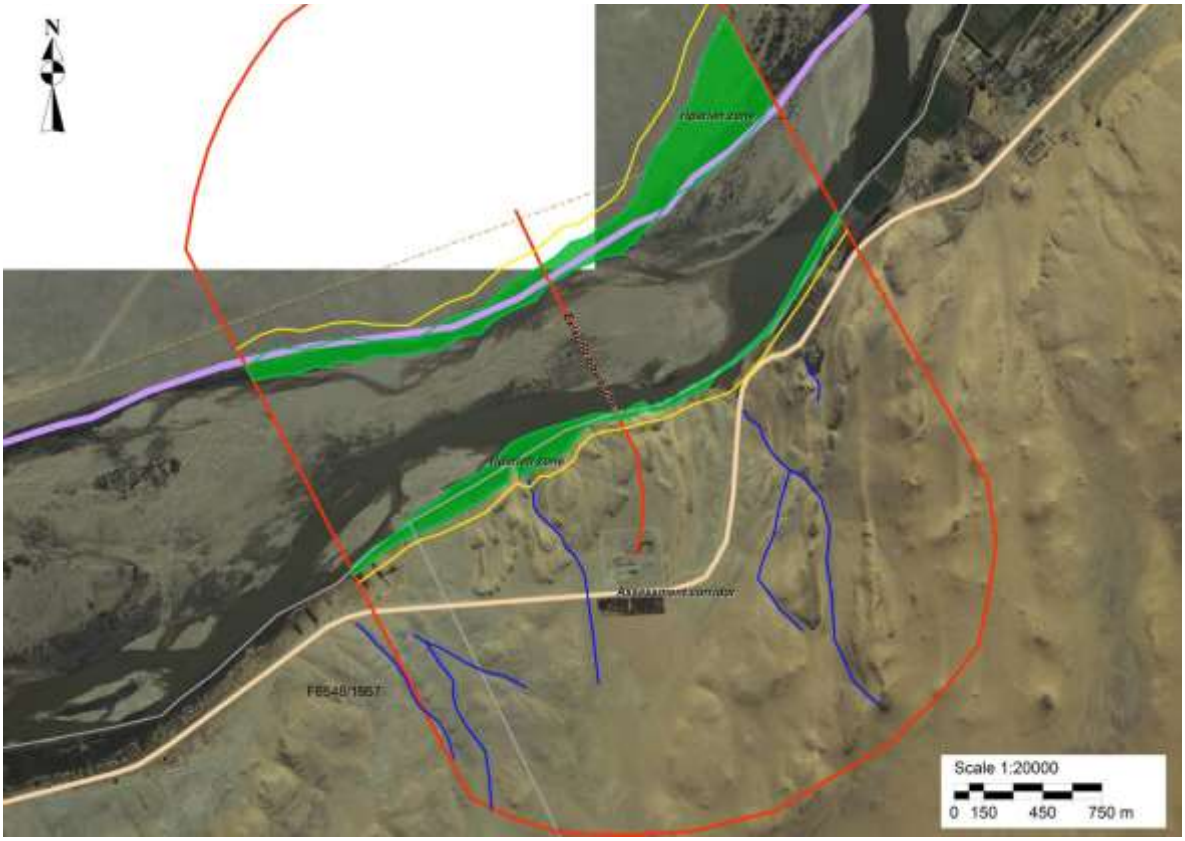
Within the corridor for the construction of the proposed powerlines, the aquatic ecosystem constraints consist of the lower Orange River and its associated aquatic habitats. Small drainage features also drain the hillside south of the river. These features do not drain into the river and do not provide any aquatic habitat of significance but simply provide a conduit for water draining the steep bank south of the Orange River.

The mapped drainage lines should preferably be avoided. If this is not avoidable the impact would be negligible however the impact to the runoff in the drainage line would need to be mitigated.

The expansion of the substation should preferably take place to the south and/or east of the existing substation as this would be further from the drainage feature to the west of the substation.

Freshwater Constraints Map

Green areas indicate riparian zones and blue lines indicate drainage lines



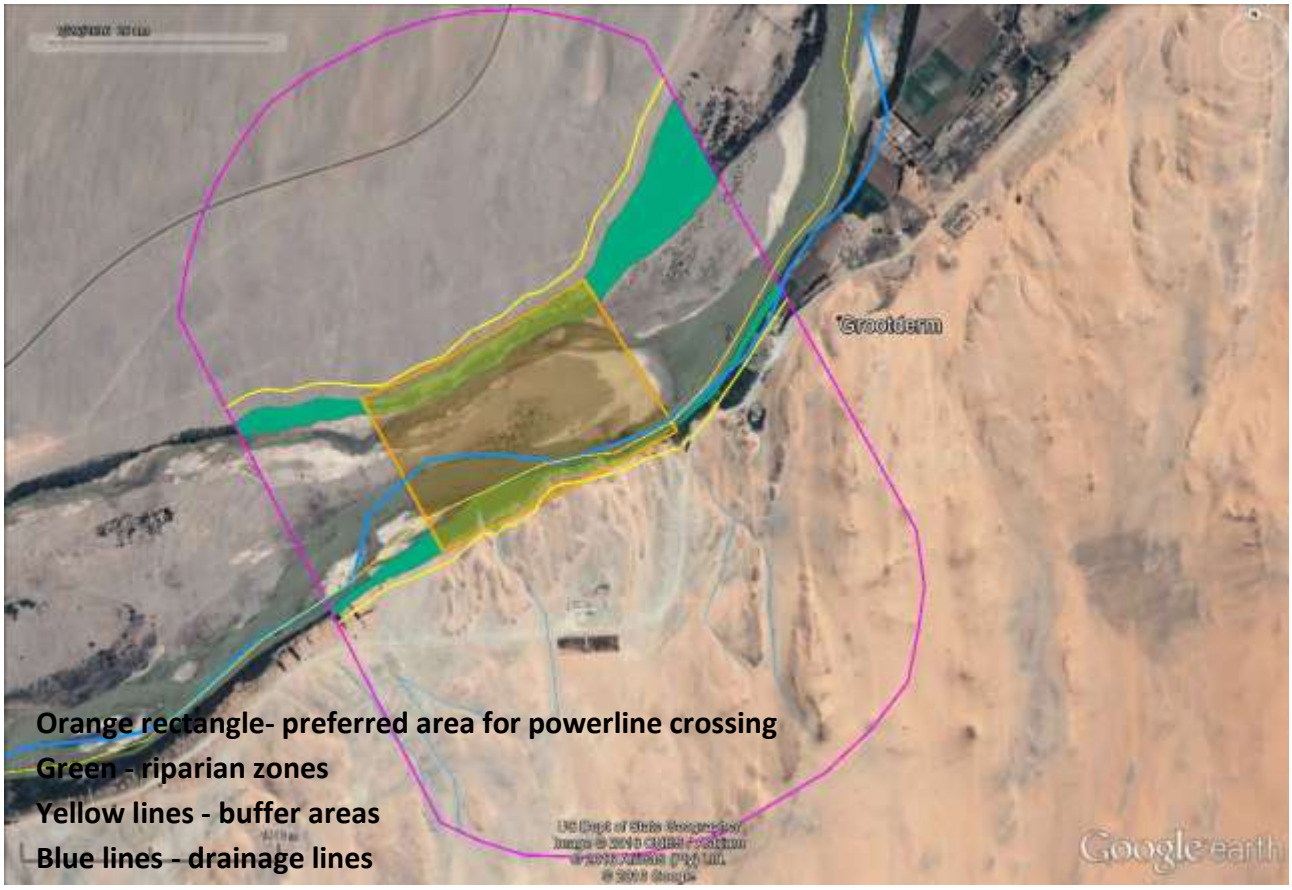
EXPECTED IMPACT ON THE AQUATIC AND RIPARIAN AREA

(Also refer to Chapter 6 where impacts are assessed and mitigation measures provided.)

Potential impact consist largely of the direct modification or loss of aquatic habitat and the associated impacts to aquatic biota, and to a lesser degree potential flow and water quality impacts that would mostly take place in the construction phase of the project.

Eskom has indicated that they will be unable to achieve the span of approximately 1000m required for the pylons to remain outside of the river channel, its riparian zone and the recommended buffer areas. The river and riparian zones within the corridor assessment ranges from approximately 825m to 1200m in width. The proposed crossing could thus be located within the corridor where the mapped river channel and riparian zone does not exceed 950m. This would imply that the pylons would be located within the recommend buffer but not within any of the mapped riparian zone.

Google Earth image with the section of corridor where the river channel and riparian zone is less than 950m (orange rectangle) and potentially where the line could cross without impacting on the riparian zone



Any works within the recommended buffer would need to be limited as far as possible and rehabilitated after the works were completed. The minimum area required for the works in the buffer areas should be demarcated and the works restricted to these areas. Rehabilitation would entail reshaping of the disturbed areas around the pylon and along the access road to the pylon to resemble that of the surrounding landscape. Any topsoil removed for the works should be removed and stockpiled and then replaced as topsoil in the disturbed areas. If necessary these areas should be revegetated with local indigenous vegetation.

The mitigation measures provided in the freshwater assessment report would apply to the works within the buffer. In particular any invasive alien plant growth occurring within the immediate area of the construction activities in the buffer should be removed and any regrowth prevented.

Water Use Authorisation

As per requirement in terms of the **National Water Act (Act No 36 of 1998)**, the applicant is required to obtain a Water Use License or General Authorisation for the activity from the regional office of Department of Water and Sanitation. The relevant listed activities are :

- Section 21 (c) Impeding or diverting the flow in a watercourse
- Section 21 (i) Altering the bed, banks, course or characteristics of a watercourse

The Risk Assessment Matrix as distributed in December 2014 by the DWS was used in the assessment of the risk posed to the aquatic ecosystems for the proposed road upgrade. The proposed activities pose the following risks to the aquatic ecosystems for each of the activities

Phase	Activity	Impact	Significance	Risk rating
Construction	Construction of the proposed substation extension, two powerlines and access road	Disturbance of habitat and possibly some very limited surface water runoff and water quality impacts	**40**	**L**
Operation	Maintenance activities associated with the proposed substation extension, two powerlines and access road	Loss of biodiversity & habitat - Facilitation of erosion and potential for invasion by alien plants	**54**	**L**

The regulation relating to General Authorisations for Section 21 (c) and (i) water uses has been revised such that in future any water use activity that has a moderate to high risk of impacting on water resources will be required to apply for a water use licence while those with a low risk of impact can be authorised in terms of the new General Authorisation. General Authorisation in terms of the Water Act could therefore be relevant to this project.

Conclusion

It was concluded that impact can be mitigated to acceptable levels and that the project can continue from an aquatic point of view.

4.2.3 ECOLOGICAL REPORT ON THE FLORA AND FAUNA

An Ecological Report on the Flora And Fauna was compiled by EnviroGuard Ecological Services CC and is attached in Appendix C(3). A summary of the relevant sections is provided below.

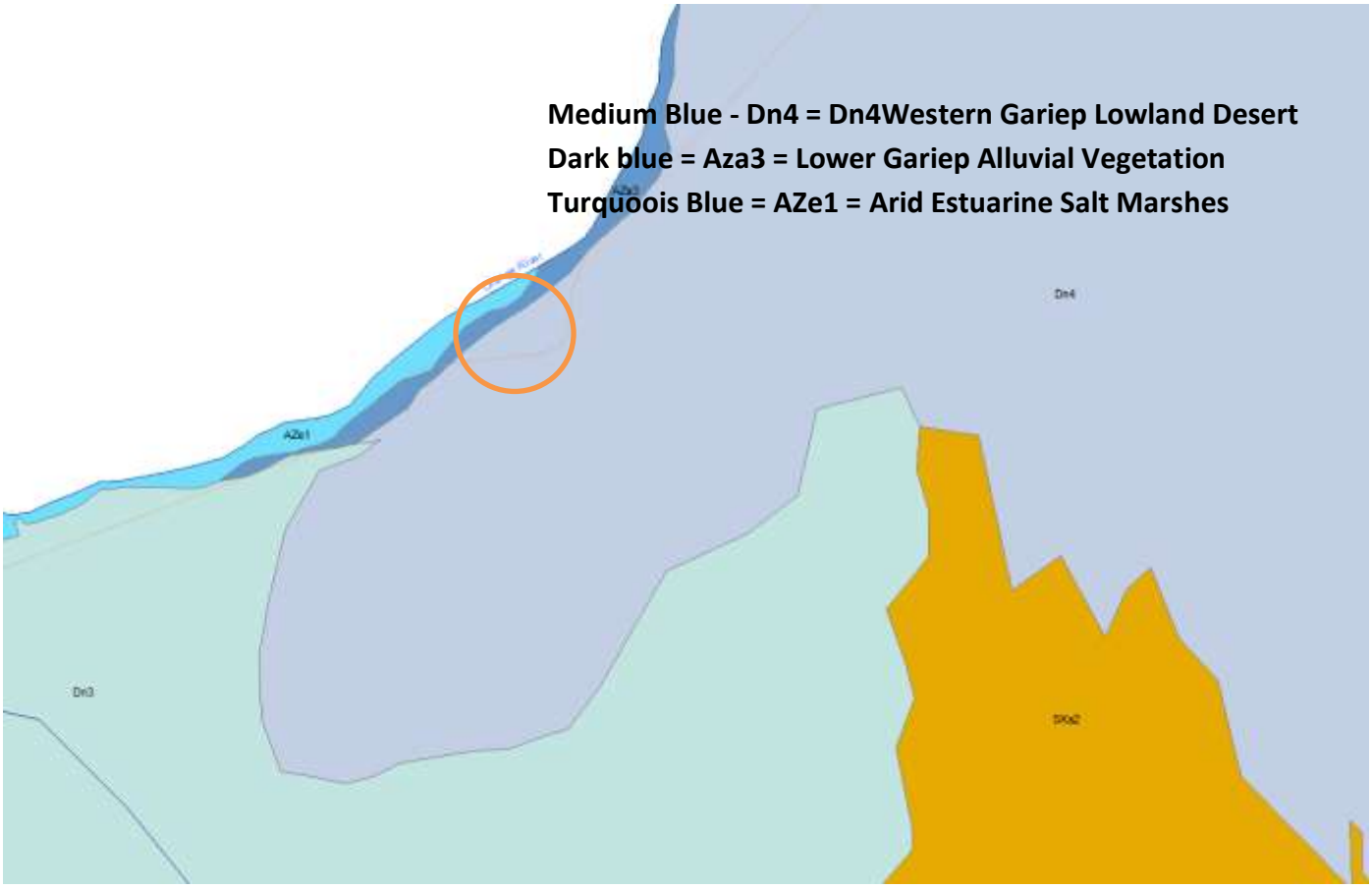
VEGETATION

- There are **three vegetation types** present in the study area:
    - Western Gariep Lowland Desert (Dn4);
    - Lower Gariep Alluvial Vegetation (Aza3)
    - Arid Estuarine Salt Marshes (AZe1).
- There are **two vegetation units** had been described (according the the following numbering system further down):-
    - The desert area
        - 1(a) Lowland section
        - 1(b) Rocky Section
    - Riverbank area

VEGETATION TYPES

On a small scale the proposed route falls within the desert biome and within a larger regional scale the proposed routes are according to Mucina & Rutherford (2006) located within the Southern Namib Desert Bioregion (Dn).

Map of Vegetation Types in the Macro Area



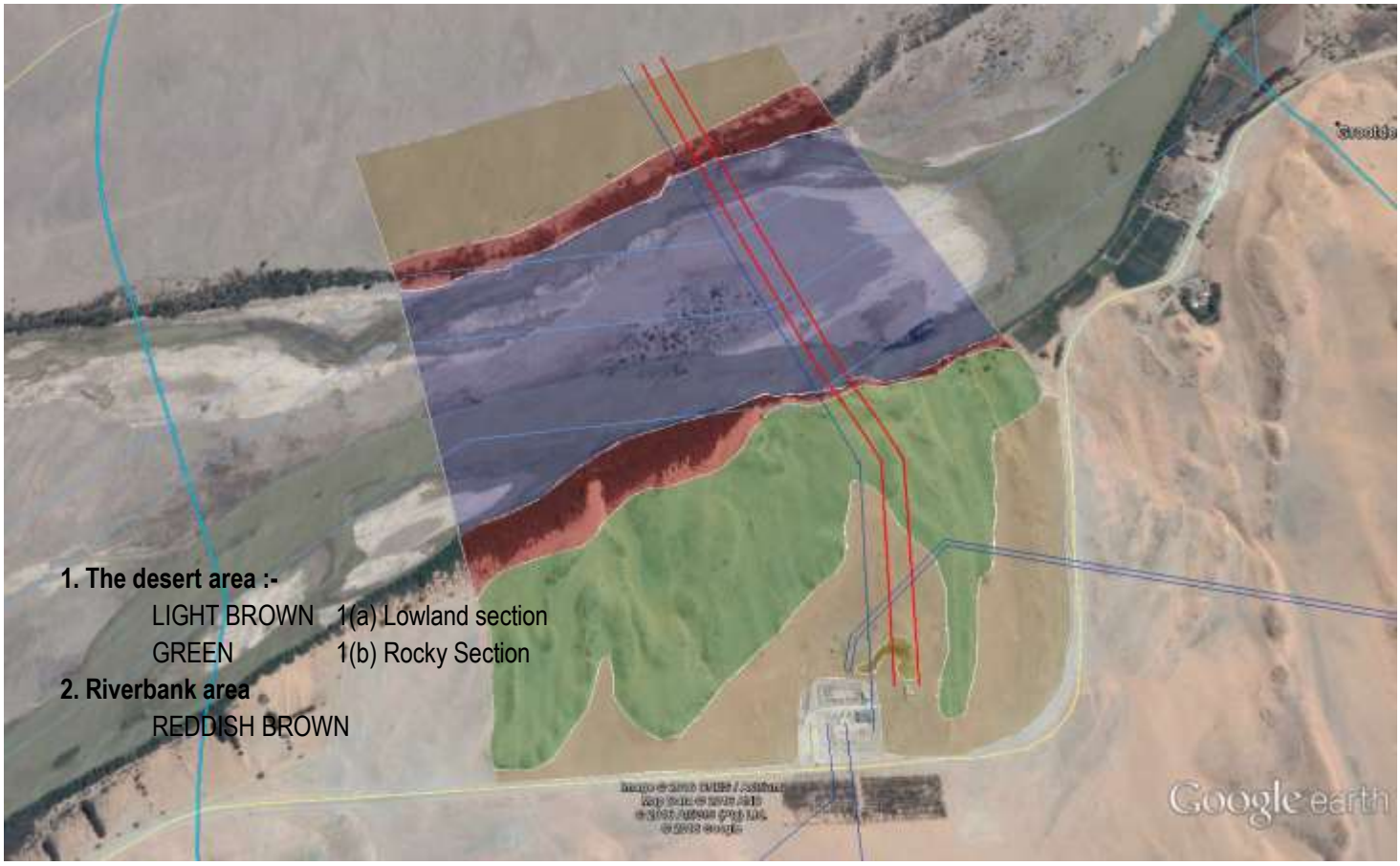
From a conservation point of view the Western Gariep Lowland Desert is regarded as being a least threatened vegetation type, though none is formally conserved. Only 3% of this vegetation type is considered as transformed.

From a conservation point of view Lower Gariep Alluvial Vegetation is regarded as being an endangered vegetation type with only 6% of the target of 31% statutorily conserved. More than 50% is already transformed due to agricultural practices.

From a conservation point of view it is regarded as least threatened although some 15% is transformed due to development and agricultural practices.

VEGETATION UNITS

Map of Vegetation Units in the Study Area



1. Desert area

Soil	Red-yellow apedal freely drained.	**Tree cover**	0%
Topography	Low shrubland and rocky hills	**Shrub cover**	2%
Land use	Mostly natural – free moving wildlife	**Herb cover**	5%
Unit status	Mostly natural	**Grass cover**	1%
Faunal spp.	Birds, insects, small mammals	**Rock cover**	5-50%
Erosion	N/A		
Dominant spp.	Various		
Conservation value	High		
Ecosystem functioning	High		

This unit comprises the largest section of the study area and stretches from the substation in the south to the Orange River in the north. The vegetation is as expected sparse and comprises plants adapted to this dry and harsh environment. Rock cover varies between 5-50% and is comprises small pebbles to medium-sized boulders. The lower-lying area closer and around the substation is degraded with old building material, roads and footpaths present. In these areas the natural vegetation has become degraded. There is also a small rocky ridge directly adjacent to the substation with buildings at its footslope. On the ridge there is a two-spoor road that leads to a water reservoir on top. The hill is mostly degraded and together with the lower-lying areas around the substation constitutes a degraded area.

There is various species present with no one species dominant. This unit can be divided into two sub-units namely the a) Lowland section and b) the Rocky section. Both these sections form a mosaic distribution pattern and generally have a similar vegetation structure and composition.

a) Lowland section

This section is located mostly around the substation in the southern section of the study area. The terrain is mostly flat with small pebbles and sand covering up to 85% of the area.

b) Rocky Section

This section is located in the northern part of the study area and occurs mostly on rocky ridges that are partly buried in sand. This area slopes towards the Orange River in the north where moderate to steep inclines are present. The rocks cover up to 50% of the area and consists of medium to large boulders. Deep sand covers some sections and can cover up to 40% of the area.

The vegetation is typical of the Western Gariep Lowland Desert vegetation type. The area is scenically natural and undisturbed, and also rich in succulent species. More than 35 different plant species were identified within this unit giving it a moderate to high species richness for this vegetation type. From a plant ecological and ecosystem functioning point of view this unit has a high conservation value.

2. Riverbank area

Soil	Deep sand to loamy clay	**Tree cover**	10-20%
Topography	Steep to moderate northern slope	**Shrub cover**	15-70%
Land use	Mostly natural – free moving wildlife	**Herb cover**	1%
Unit status	Natural to degraded	**Grass cover**	1%
Faunal spp.	Birds, insects, small mammals	**Rock cover**	3-40%
Erosion	N/A		
Dominant spp.	*Searsia lancea*		
Conservation value	High		
Ecosystem functioning	High		

The riverbank area forms a moderate to narrow strip along the edge of the Orange River. In some areas there are steep embankments with large rocks covering up to 60% of the area while in other

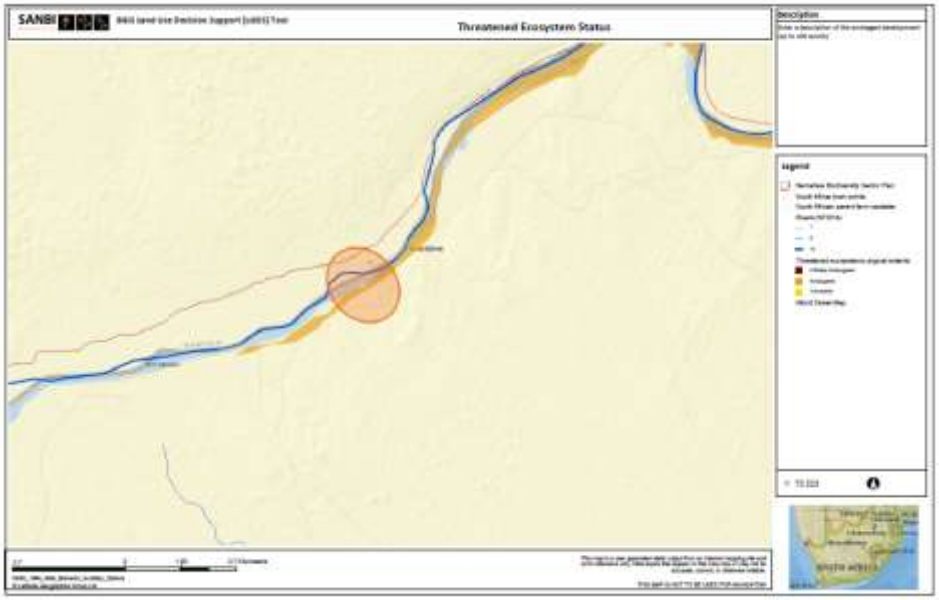
areas the riverbank is gentle with mostly deep sand. The soil is characterised by red-yellow sand that has been deposited onto the loamy clay soil underneath. The vegetation is very homogeneous with only a few species present.

The unit comprises a narrow section along both sides of the Orange River. The vegetation is dominated by the indigenous tree *Searsia lancea* that occurs as tall shrubs. In some areas the vegetation forms dense impenetrable stands and in other areas especially where the riverbank is steep and mostly rocky it is more open and sometimes bare with only sand and rocks present. As is normal with riverbanks some areas are eroded and alien species are present in some localities. Riverbanks are subjected to regular flooding causing erosion and also assisting with the dispersal and establishment of alien and other invasive species. These areas are however important from a plant ecological and ecosystem functioning point of view while also providing habitat for various animal species. This unit is therefore regarded as having a **high conservation value.**

The results of the above **impact evaluations** for vegetation units 1 and 2 show that the proposed power lines should have no severe (**high**) impacts on the different units with **medium-low** impacts over the **short-long term** that will be experienced in the different vegetation units (fauna & flora). The expansion of the current substation to the east will however lead to the destruction of a section of the rocky hill area (unit 1b) that will be permanent. If proper mitigation measures are implemented the effect can however, be somewhat mitigated to lessen the impact.

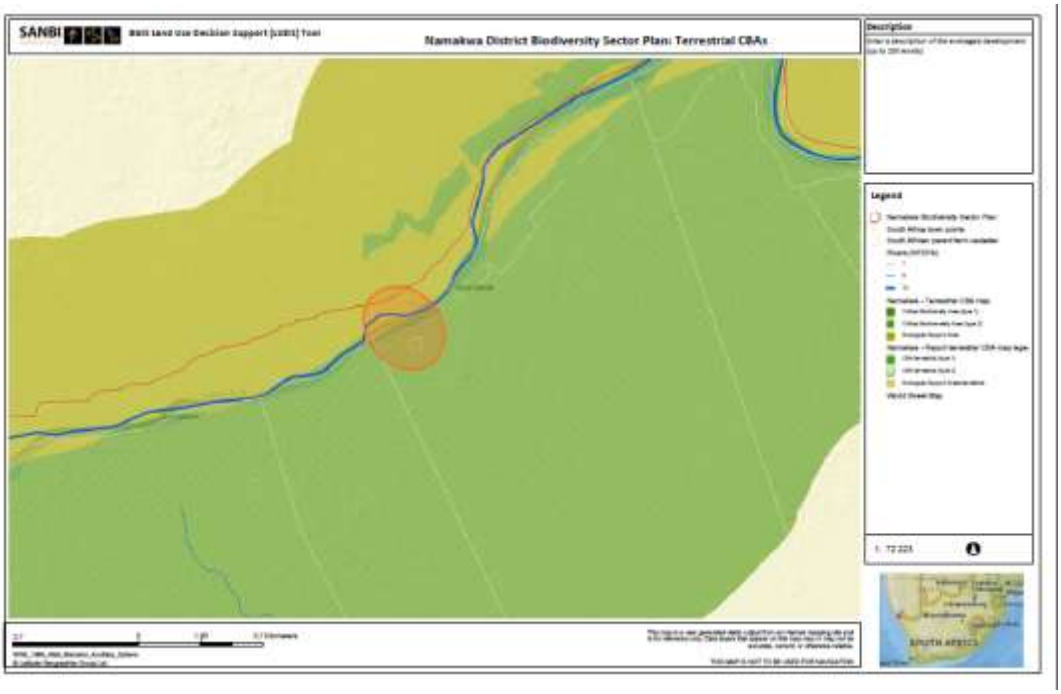
THREATENED ECOSYSTEMS, CRITICAL BIODIVERSITY AREAS & PROTECTED AREAS
The maps below are also included in Appendix A.

Threatened Ecosystems
An Endangered Ecosystem is present within the site (the rocky ridge area).



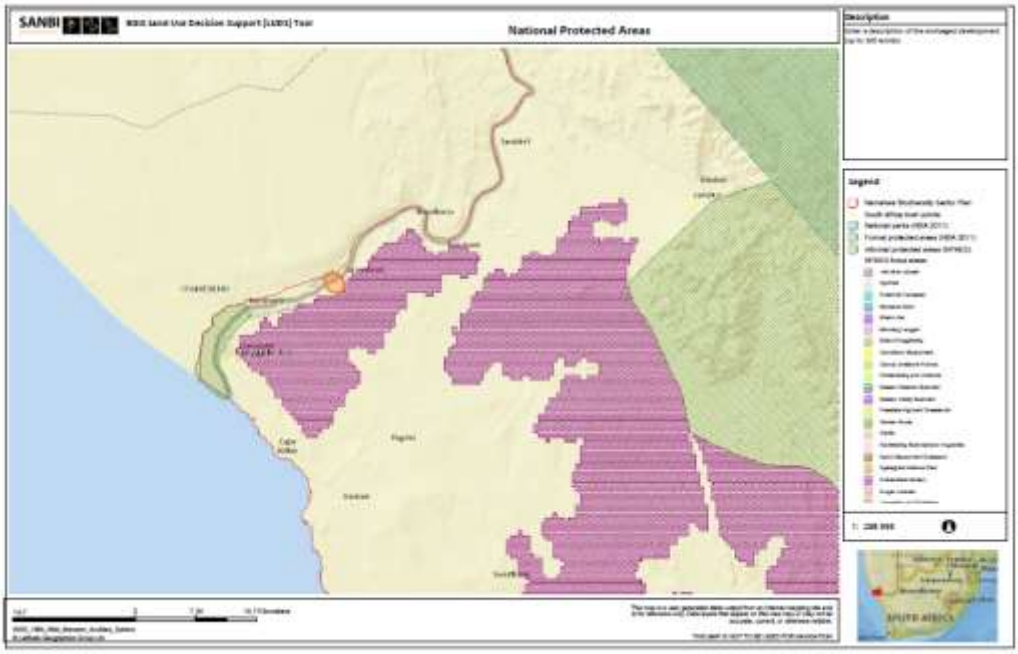
Critical Biodiversity Areas

The site is identified as a CBA Type 2 on the South African side and an Ecological Support Area on the Namibian side of the Orange River.



Protected Areas

The study site does not fall within a nationally protected area or a National Protected Area Expansion Strategy (NPAES). The purple shaded area is adjacent to the site and identified as the Richtersveld NPAES.



MEDICINAL SPECIES

A total of two medicinal plant species, have been identified within the study area. These plants occur throughout the region and none are threatened species.

Plant name	Plant part used	Medicinal use	Vegetation unit
Vachellia karroo	Leaves, bark and gum	Diarrhoea & dysentery Gum: colds, oral thrush & haemorrhage	2
Eriocephalus africanus	Leaves & twigs	Stomach ache, heart disease, perfumes	1a

ALIEN PLANT SPECIES

The only alien plant species found to be present with the vegetation and fauna ecological study was *Salix babylonica.* The tree is a category 2 invader according to CARA, but not listed by NEMA. It is included in the final report. It might be true that other alien species are present along the riverine area, but although not found in this study it will not change or affect the results of the study.

RED DATA SPECIES

No red data species were found to be present in the study area. Unit 1 (a & b) do however present suitable habitat for some species.

PROTECTED SPECIES

The Northern Cape Provincial Act (Act 9 of 2009) has listed requirements regarding flora to ensure the sustainable utilisation of plants. According to this Act there is a list of protected and specially protected plant species for the Province. According to this Act no person may pick, import, export, transport, possess, cultivate or trade a specimen of a protected or specially protected plant from any natural area. The act further specifies that no person may without a permit pick an indigenous plant on a public road, within 100 m from a river except under a license or exemption granted by the Director of Nature Conservation of the Province to an applicant and subject to such period and conditions as may be stipulated. A formal application for such a permit must be made to the Director of Nature Conservation stating the purpose and reasons for removing, transporting, relocating etc. the plant.

SENSITIVITY ANALYSIS

A sensitivity analysis was done for the two vegetation units identified. The results indicate that both units have a ***medium ecological sensitivity to disturbance***.

The medium sensitivity is mostly due to the sparse vegetation cover, low number of medicinal plants and low area fragmentation. It does however not mean that the area has a low conservation value and ecosystem functioning, but rather that certain types of development can be tolerated and if properly mitigated it should have little negative impact.

Ecological Sensitivity Map

Light Yellow = Low sensitivity **Orange = Medium sensitivity**

Ecological Sensitivity of the different vegetation units *(if properly mitigated)* along the proposed corridor based on the data and the sensitivity analyses

FAUNA

The desert of South Africa borders the Nama-karoo Biome in its eastern parts (summer rainfall region) and the Succulent Karoo Biome in the western parts (winter-rainfall region). The Nama-Karoo and Succulent Karoo, now almost devoid of large wild ungulates, holds some 10 million Sheep (*Ovis aries*) and Goats (*Capra hircus*).

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. 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 irrigated agricultural areas surrounding the site as well as historic hunting for the biltong industry limits the suitability of the site for larger mammal species.

Animal burrows (Suricate) were observed around the sandy sections adjacent to the Orange River. Several active Bat-eared Fox burrow systems were observed within the sandy areas adjacent to the rocky ridges. Small isolated patches of rocky outcrops and ridges are present in some localities and offer suitable habitat for rupicolous mammal species such as Rock Hyrax, Round-Eared Elephant Shrew, Western Rock Elephant-shrew, Bushveld Elephant Shrew, Dassie Rat, Smith's Rock Rabbit and Namaqua Rock Mouse. The rocky ridges offer suitable habitat for Egyptian Free-Tailed Bats which roost in narrow rock-crevices.

Threatened Mammal Species

According to Friedman & Daly (2004) and Skinner & Chimimba (2006), the majority of species within the study area are common and widespread and listed as species of least concern. The site does offers suitable foraging and exploratory habitat for Brown Hyaena.

The proposed powerline and extension of the substation should not have any significant impact on any threatened mammals species likely to occur in the area and a low impact on remaining mammal species.

Reptiles

Due to historic and 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. Rocky outcrops as well as ridges occur around the proposed alignments and provide favourable refuges for certain snake and lizard species (rupicolous species).

Suitable habitat occurs in the rocky outcrops for several gecko species as well as Coral Snakes (*Aspidelaps lubricus*). Suitable habitat occurs for the Karoo Girdled Lizard (*Karusasaurus polyzonus*) in the rocky hills, inhabiting fissures between rocks and under loosely embedded rocks. Suitable habitat occurs for the endemic Angulate Tortoise (*Chersina angulata*) as well as Namaqua Tent Tortoise (*Psammobates tentorius trimeni*) within the rocky sandveld. Suitable habitat occurs for the endemic Cape Cobra (*Naja nivea*), Puff Adder (*Bitis arietans*), Horned Adder (*Bitis caudalis*), Mole Snake (*Pseudaspis cana*), Whip Snake (*Psammophis notostictus*), Spotted Grass Snake (*Psammophylax rhombeatus rhombeatus*).

Threatened Species

No threatened reptile species have been recorded from the 2816 CC and 2816 BC and one species namely the Richtersveld Pygmy Gecko (*Goggia gemmula*) has been recorded in the adjacent 2816 BB.

Several endemic reptile species occur in the area namely Cape Cobra (*Naja nivea*), Southern Spiny Agama (*Agama hispida*), Smith's Desert Lizard (*Meroles ctenodactylus),* Knox's Desert Lizard *(Meroles knoxii),* Spotted Desert Lizard (*Meroles suborbitalis*) and Austen's Gecko (*Pachydactylus austeni*).

Amphibians

The biogeographical distribution of amphibians in the area falls within the Western Subregion and the winter rainfall region. The frogs fall within the Namaqualand assemblage or Arid West assemblage. One frog species has been recorded from the 2816 BC QDGC namely Queckett's River Frog *(Amietia quecketti*). The floodplain areas of the Orange River offer suitable habitat for Raucous Toad (*Sclerophrys capensis*), Paradise Toad (*Vandijkophrynus robinsoni*) and Karoo Toad (*Vandijkophrynus gariepensis*) and Namaqua Caco (*Cacosternum namaquensis*).

Habitat available for sensitive or endangered species

No red listed or threatened amphibian species were recorded from the 2816BC QDGC or are likely to occur within the proposed substation extension footprint or powerline alignments.

EXPECTED IMPACTS

(Also refer to Chapter 6 where impacts are assessed and mitigation measures provided.)

Fauna

Habitat destruction and disturbance

During the construction phase and maintenance of powerlines, some habitat destruction and alteration inevitably takes place. This happens with the construction of access roads, and the clearing of servitudes. These activities have an impact on fauna breeding, foraging and roosting in or in close proximity of the servitude, both through modification of habitat and disturbance caused by human activity.

Surrounding Farming Activities: Domestic Livestock

The construction team could disturb and interfere with animals which could lead to injuries and fatalities which could give rise to claims from the Landowners.

Flora

The construction of pylons for the power lines and substation will inevitably have an impact on the surrounding ecosystem. The severity of the impact, however, varies, depending on the nature of the activity and mitigation measures followed. Different impacts on the vegetation will be experienced during construction and operational phase.

Impact 1 – Loss of natural vegetation
Impact 2 – Habitat fragmentation (loss of landscape connectivity)
Impact 3 – Impacts on vulnerable species
Impact 4 – Establishment of invasive plants and declared weeds
Impact 5 – Destruction of rocky vegetation where the new substation will be constructed

CONCLUSION

The impact assessment concluded that impact on the fauna & flora could be mitigated to acceptable levels.

4.2.4 BIRD IMPACT ASSESSMENT

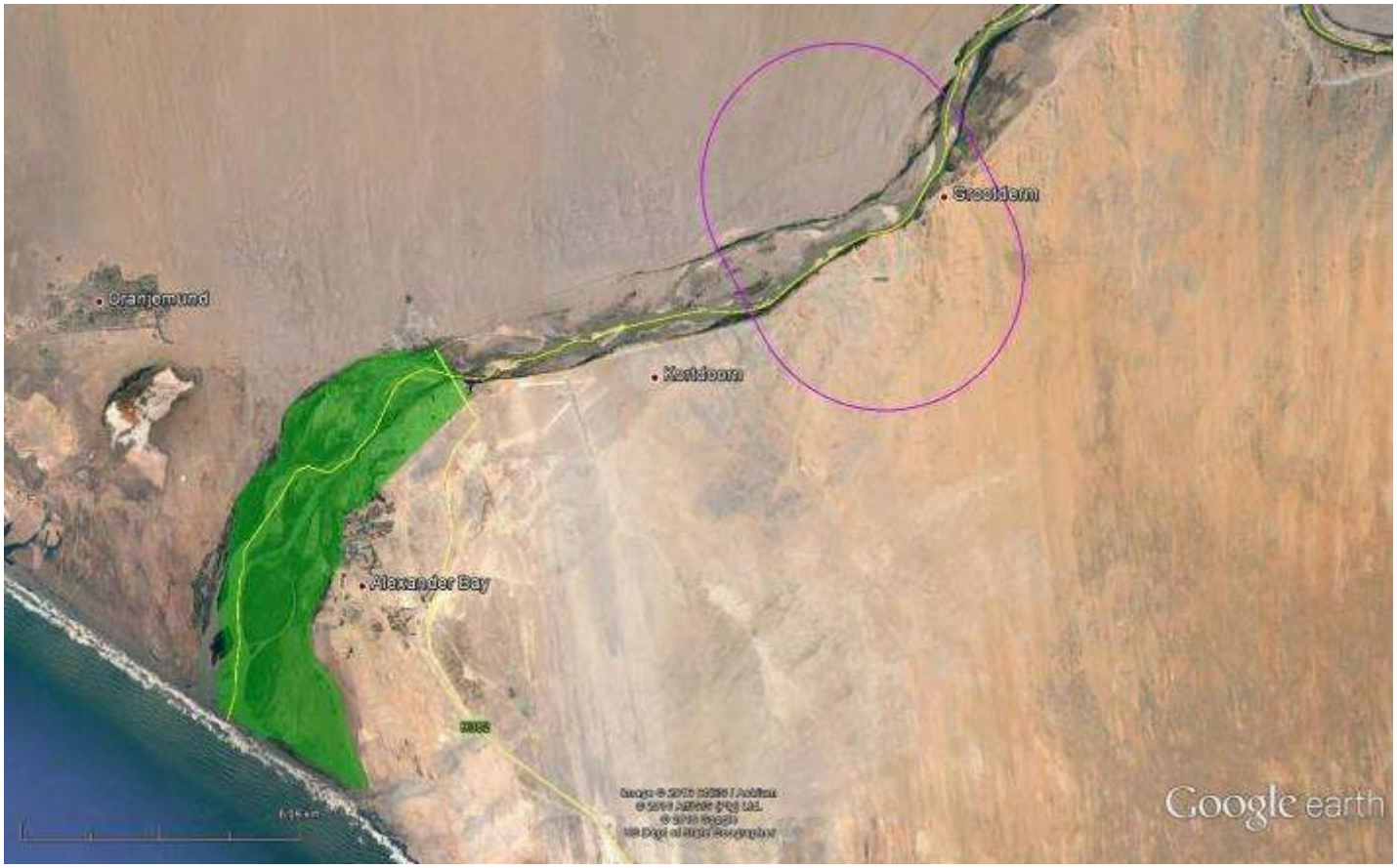
A Bird Impact Assessment was undertaken by Mr Chris van Rooyen Consulting and is attached in Appendix C(4). A summary thereof is provided below.

IMPORTANT BIRD AREAS

The study area is located approximately 10km upstream from the Orange River Mouth Wetlands Important Bird Area (IBA) (SA 030) This IBA was declared a Ramsar site in 1991, as was the Namibian side of the mouth in 1995. Together they form the Orange River Mouth Transboundary Ramsar Site.

The Orange River mouth is located on the arid Atlantic coast at South Africa's border with Namibia. The nearest town is Alexander Bay. It is a delta-type river mouth, consisting of a series of braided troughs interspersed with sand banks, channel bars and islets, with a tidal basin and salt marshes. Extensive mudflats occur at the mouth, and large areas of intra-fluvial marsh occur upstream of the mudflats. This system is so dominated by fresh water that it has few estuarine characteristics. It is a highly disturbed, modified ecological system as a result of years of degradation due to diamond mining activities, flow regulation of the river, and poor management of the mouth. Approximately 60% of the landscape is in a near-natural state, and 40% has been degraded or transformed by the cultivation of lucerne, mining activities, wind erosion, roads and sewage ponds.

This IBA is considered to be a critical coastal wetland in southern Africa because of the overall numbers of wetland birds it supports and because of its role as a migration stopover. A total of 253 bird species has been listed of which 102 are waterbirds.



The location of the Orange River Mouth Wetlands Important Bird Area (IBA) (SA 030) (green area) in relation to the study area (purple oval).

AVIAN HABITAT CLASSES

The following avian habitat classes were recorded within the core study area:

Desert

The vegetation type (Western Gariep Lowland Desert) consists of sparse low shrubland with mainly leaf- and stem-succulent chamaephytes (a low-growing perennial plant whose dormant overwintering buds are borne at or just above the surface of the ground). This vegetation type occurs mainly around the Oranjemond substation on dunes and rocky outcrops.

Priority species that could be found in this habitat are Ludwig's Bustard, Barlow's Lark, Cape Long-billed Lark, Pale-winged Starling, Tractrac Chat, Martial Eagle Polemaetus bellicosus and Lanner Falcon Falco biarmicus.

Rivers

The study area is situated at the upper end of the Orange River mouth which consists mostly of salt marshes with patches of supratidal salt marshes on elevated terraces. Vegetation is formed mainly of low succulent dwarf shrubland patches, forming a mosaic with creeping grassy mats and patches of reed beds. Alien trees are found along the banks of the river, forming dense stands in places.

Priority species that could be found in this habitat are Greater Flamingo, Lesser Flamingo, Great White Pelican, Caspian Tern, African Marsh-harrier, Chestnut-banded Plover, Cape Spurfowl, Black-necked Grebe, South African Shelduck, Cape Shoveler, Pied Avocet and Kelp Gull. The river also acts as a flyway for a large number of non-priority waterbirds, including African Fish-Eagle which utilises the stands of trees for nesting and roosting.

Agriculture

Limited agricultural activity, mostly irrigated lucerne, is cultivated along the edge of the river. Few priority species would be attracted to this habitat, except Ludwig's Bustard on occasion.

POWER LINE SENSITIVE PRIORITY SPECIES OCCURRING IN THE STUDY AREA

The species most relevant to this impact assessment are:

- Resident and breeding priority species that is potentially susceptible to displacement from the area during construction activities.
- Priority waterbird species that may frequent the Orange River, possibly resulting in collision with the proposed power line.

EXPECTED IMPACTS

(Also refer to Chapter 6 where impacts are assessed and mitigation measures provided.)

Negative interactions between wildlife and electricity structures take many forms, but two common problems in southern Africa are electrocution of birds (and other animals) and birds colliding with power lines. Other problems include electrical faults caused by bird excreta when roosting or breeding on electricity infrastructure, and displacement through disturbance and habitat destruction during construction and maintenance activities.

Impact 1 – Electrocutions

Impact 2 – Collisions

Impact 3 – Displacement due to habitat destruction and disturbance

CONCLUSION

The impact assessment concluded that impacts on the avifauna could be mitigated to acceptable levels.

4.3 CULTURAL/HISTORICAL ENVIRONMENT

4.3.1 PALAEONTOLOGICAL IMPACT ASSESSMENT

A *Palaeontological Impact Assessment* was undertaken by Prof Marion Bamford (Evolutionary Studies Institute. University of the Witwatersrand) and is attached in Appendix C(5). A short summary thereof is provided below.

This whole region, the Gariep Belt, where the African plate was sub-ducted below the South American plate, around 770-730 million years ago, was tectonically and volcanically active and did not provide good conditions for the preservation of any marine or invertebrate fossils.

If, in the extremely unlikely event of any trace fossils or invertebrate fossils being found once excavations for foundations for the towers, power station and infrastructure have begun, they should be removed and protected, and a palaeontologist called to assess their significance.

CONCLUSION

As far as the palaeontology is concerned the proposed development can go ahead. Any further palaeontological assessment would only be required after development has commenced and if fossils are found by the geologist or environmental personnel.

4.3.2 CULTURAL HERITAGE IMPACT ASSESSMENT

A Cultural Heritage Impact Assessment was undertaken by Archaetnos Culture & Cultural Resource Consultants and is attached in Appendix C(6). A short summary thereof is provided below.

This geographical area is not well-known as one containing many prehistoric sites. One however has to realize that this most likely only indicates that not much research has been done in the area before. On the existing SAHRA Database no such sites are indicated for this area, but there are a few heritage surveys that were done in the macro area.

It should also be noted that the Richtersveld World Heritage Site is situated towards the south-east of the project area. It however is more than 50 km away and therefore no impact is expected. The palaeontological assessment done indicates that there are no records of invertebrate or trace fossils from the study area.

CONCLUSION

No sites of cultural heritage significance was located in the surveyed area. However many stone tools have been noted and this will need further investigation.

The survey of the indicated area was completed successfully. The following is recommended :

- A walk-down study should be implemented once the pylon positions are known, to ensure minimal impact on stone tools in the area. It may even be necessary to have an archaeologist present on site when construction of the pylons and the demolition of the indicated hill are being implemented, but the walk-down study will give the necessary guidance in this regard.
- The latter would aim at collection a representative sample of stone tools from the area since it is terra incognito as far as research goes and would therefore assist in elucidating this part of history.
- It should always be realized that the subterranean presence of archaeological and/or historical sites, features or artefacts is a distinct possibility. Due to the nature of this development and the environment, it is indeed expected that some Stone Age sites may only become known later on, thus emphasizing the need for further studies.

4.4 SOCIAL ENVIRONMENT

4.4.1 SOCIAL IMPACT ASSESSMENT

A Social Impact Assessment was prepared undertaken by AMP Property Management and Land Acquisition and is attached in Appendix C(7). A summary of the relevant sections is provided below.

The aim of this assessment is to investigate and describe the potentially affected social, economic and utilisation of property functions in the environment and the impact of the proposed project thereon.

DEMOGRAPHICS

The region has a limited variety of land uses mostly but not exclusively diamond mining and agricultural activities which mostly consist out wide spread, sparse cattle, sheep and goat husbandry. Recent EIA's have been conducted for Solar Energy Facilities and associated infrastructure as well as mineral and mining right application.

The proposed project will not directly affect the residential areas but may have some impact on rural farms in the area. The power line does not cross specifically over tourist areas however it may have an indirect influence on Spogplaas Bed and Breakfast, which is the only tourist accommodation other than camping facilities, on the road between Alexander Bay and Richtersveld National Park. Denser residences are however found near on neighbouring properties to the east of the proposed corridor.

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*
  Macroeconomic 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 in the area is used as grazing for widespread livestock including cattle, sheep and goats. The vegetation does however have low potential grazing, there are also limited cultivated lands.

  The greatest encroachment on the property will be during the construction period.

  The macro environment being defined as the area surrounding the specific portion of Groot Derm 10, will be influenced through the increase of traffic of specifically construction related vehicles. There will also be possibilities for the local communities in terms of hospitality facilities for the contractors during construction.

  The 2 x 400kV power lines as proposed could have a negative impact on the aesthetics of the area. The existing 66kV power line however provides a visual impact on the area and is therefore a mitigating factor to this process. During interviews and meetings with IAPs, it appears that this aspect is not one of concern to local community.

- *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.

- *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 project 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 through increasing the available electricity supply in the area.

- *Socio-Cultural Processes*
  The aspects in the culture and the way people live together are applicable in this section. This project needs to be handled with great sensitivity in terms of socio-cultural aspects. All the properties neighbouring the remainder of the farm Groot Derm 10, is owned by the Richtersveld Sida Hub Communal Property Association.

  According to Department of Rural Development and Land Affairs there is currently a land claim under investigation on the property. Special measures have therefore been implemented to ensure the CPA's involvement in the EIA process, and it is essential that transparent and clear communication channels remain open with the current land owner as well as the claimants throughout the project scope.

  During construction there may be an influx of people from other areas mainly for labour purposes. The greater part of the local community also suffers from unemployment and job opportunities are scarce in the area, it is therefore an aspect to consider especially during the construction phase when there may be high expectations of job opportunities and wealth inflow.

SOCIAL ASSESSMENT MEASURES

Main affected & interested parties

- Mr FAM Gomes – Owner of the remainder of Groot Derm 10
- Mr Carlos Alves – tenant and owner representative
- Annamarie & Simone Reck – Spogplaas Guesthouse
- Richtersveld Sida Hub Communal Property Association

LAND USE POTENTIAL

Tourism

The greater Richtersveld area provides various types of tourist attractions on a road less travelled. Attractions include both cultural (Nama people) and environmental (unique landscapes, animals and vegetation) aspects. The area offers various activities for the nature lover, adrenalin junkie and outdoor enthusiast including: 4x4 trails, hiking trails, bird watching, flower season, kayaking etc.

- *Spogplaas*

  This accommodation is located on the property that is affected by the proposed project. The corridor is located approximately 950m from the guesthouse. Spogplaas is the only accommodation of its kind on the road from Alexander Bay towards Sendelingsdrift at Richtersveld National Park. The guesthouse is also approximately 12km by road from the Alexander Bay Border Control.

  During an interview with the owners of the guesthouse it became clear that the owners are content with the proposed project and happy to cooperate with Eskom. The greatest concern is that they currently do not have electricity on the premises. This means that they also do not have water since they are unable to pump without electricity.

  At the stage of the study they were dependent on water that is delivered to them by the Richtersveld Local Municipality. Originally they purchased electricity from the neighbouring Richtersveld Sida Hub CPA. Eskom has needed to cut the CPA's connection due to non-payment. This leaves not only the inhabitants of the neighbouring farms, but also Spogplaas and the tenant of the agricultural activities without electricity and to great extent water. There was however a negotiation in process for Eskom to arrange a new connection point directly on the farm in return for the use of a water extraction point by Eskom.

- *Camping Sites*

  There are two camping sites located in a 10km radius from the corridor. Pacthvlei, to the west of the corridor, seems to no longer be open to the public. Brandkaros, to the east of the corridor, is now under the new management. According to recent reviews the facilities have been upgraded.

- *Ai -Ais / Richtersveld Transfrontier Park*

  In the macro environment of the project is the Richtersveld National Park. In 2003 the park joined with Ai-Ais Hot Springs Game Park and is known today as the Ai-Ais/Richtersveld Transfrontier Park.

The quickest road to the park is along the dirt road past the proposed corridor. There are alternative roads; from Vioolsdrift, Eksteenfontein towards Sendelingsdrift or through Helskloof Reserve mountain pass (4x4 vehicles only).

- *Richtersveld Communal Conservancy*
  The 162,000ha Richtersveld Communal Conservancy was declared a world heritage site in 2007 based on its cultural and botanical significance. The area is also known as the Richtersveld World Heritage Site. The area is known for the various species of hardy vegetation that is located exclusively in the arid region as well as the nomadic livestock farmers, (Nama) that still lives in the ancient traditional environment.

- *Other Attractions*
  Another Tourist attraction in the area, although about 80 kilometres away, is the Eksteenfontein Tourism Information Centre, including a museum. Guided tours and craft work with some guest houses and camping facilities. Khuboes is around 50km and Lekkersing 100km away.

Agricultural

Agricultural activities in the area mostly consist out of limited livestock farming which includes: cattle, goat and sheep. Historically there was vast citrus farming taking place in the area, this however is no longer maintained and has therefore gone to ruin.

On the affected property there are irrigated lands planted with lucern as well as fruit tree orchards (but outside of the 3km corridor). These activities have however suffered due to the lack of electricity and thus water on the property.

Mining

- *Trans Hex*
  Trans Hex's Lower Orange River operations are situated along the southern bank of the Orange River in the Northern Cape and start approximately 60 km upstream from Alexander Bay and 20km from the corridor area. The operations consist of Baken and Bloeddrif Mines, both 100% owned by Trans Hex.

Renewable Energy Facilities

- *Richtersveld Sunspot 75MW solar fascility - (DEA reference 14/12/16/3/3/2/624)*
  The Richtersveld Solar project entails the construction of a 75MW PV/CPV hybrid solar facility, on the remainder of portion 10 of the farm Korridor Wes 2 (Arris) east of the corridor area considered for the Kudu-Oranjemond Project.

- *Richtersveld Keren energy solar plant - (DEA reference: 14/12/16/3/3/2/381)*
  The Richtersveld Keren energy solar plant is a PV plant planned on Farm No 600 Richtersveld, Namaqualand and east of the proposed Kudu corridor.

- *Richtersveld wind energy facility - (DEA reference: 12/12/20/1967/AM1)*
  Environmental authorisation was granted in 2012 for the construction of up to 69 wind turbines on portions 2 and 6 of Korridor Wes 2 and the remainder of Farm 1. This facility will be located south of the remainder of Groot Derm 10, where the proposed corridor is located.

LAND USE

Currently the most of the farms in the area of study is used grazing of livestock. There are numerous renewable electricity projects proposed. The additional infrastructure of this project will become invaluable of the electricity network in the region.

CONCLUSION

The impact that the proposed Kudu-Oranjemond project will have on the social environment will be limited. The project will be mostly restricted to only the property on which construction will take place that is the remainder of the farm Groot Derm 10.

The project is not expected to bring any direct significant changes to the local economy since there will be few (if any) unskilled job opportunities during the construction phase, that will benefit the community. This causes some concern since the majority of the community is unemployed.

It is of great importance that the community should be notified of as much information with regards to the project as possible. This will avoid any assumptions and possible conflicts that may arise.

The social environment has some sensitivity in terms of the current land claim on the property and the cultural heritage of the greater community. It is therefore essential that all relevant information be communicated to stakeholders during the entire EIA process.

4.3.2 VISUAL IMPACT ASSESSMENT

A Visual Impact Assessment was undertaken by Newtown Landscape Architects and is attached in Appendix C(8). A summary thereof is provided below.

TERMINOLOGY

The Visual Resource

Landscape character, landscape quality and "sense of place" (Lynch, K., 1992) are used to evaluate the visual resource i.e. the receiving environment.

Sensitivity of Visual Resource

The sensitivity of a landscape or visual resource is the degree to which a particular landscape type or area can accommodate change arising from a particular development, without detrimental effects on its character.

Sense of Place

*Central to the concept of sense of place is that the landscape requires uniqueness and distinctiveness. The primary informant of these qualities is the spatial form and character of the natural landscape taken together with the cultural transformations and traditions associated with the historic use and habitation of the area. The combination of the natural landscape (mountains, streams and the vegetation) together with the manmade structures (residential areas, roads, mining activities and power lines) contribute to the sense of place for the study area. It is these land-uses which define the area and establish its identity.

Sensitive Viewer Locations

The sensitivity of visual receptors and views are dependent on the location and context of the viewpoint, the expectations and occupation or activity of the receptor or the importance of the view. This may be determined with respect to its popularity or numbers of people affected, its appearance in guidebooks, on tourist maps, and in the facilities provided for its enjoyment and references to it in literature or art.

VISUAL ISSUES

Typical issues associated with power supply projects of this nature are:

- Who will be able to see the new development?
- What will it look like and will it contrast with the receiving environment?
- Will the development affect sensitive views in the area and if so how?
- What will be the impact of the development at night?
- What will the cumulative impact be?

VISUAL RESOURCE

Scenic quality

The *highest* value is assigned to Orange River and its wetland systems. These landscape types are also the most sensitive to visual intrusion of proposed Project activities. The rolling hills to the south, south west and north east of the site area also considered to be of high scenic quality, within the context of the study area. The rolling plains, south of the project site, the agricultural fields adjacent the Orange River and to a lesser extent the Beauvallon Village are considered to have a *moderate* scenic value.

The tall trees (mostly alien vegetation) and existing power infrastructure have been rated as low in scenic quality and are not sensitive to visual intrusion of project activities.

Taken together, the combination of these ratings results in an overall rating of **moderate** for the study area. As a result of this rating, the study area, and particularly the Project Corridor (i.e. 3km to either side of the proposed power lines) is regarded to be moderately sensitive to change to the landscape. This is primarily due to the presence of the existing power lines and sub-station that occur within the proposed new corridor, which compromise the scenic quality of the area which otherwise would have been rated high.

High River, Wetland and Rolling hills	**Moderate** Gravel Plains, Agriculture Fields and Beauvallon Village	**Low** Roads, Power Lines and the Aerodrome
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. <u>Sensitivity</u>: 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. <u>Sensitivity</u>: 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. <u>Sensitivity</u>: It is not sensitive to change in general and change

Sense of Place

The sense of place for the study area derives from the combination of all landscape types and their impact on the senses. The river and its wetlands are in stark contrast to the surrounding semi-arid nature of the landscape. The gravel / sand landscape along with the hills devoid of vegetation other that the small succulents, makes for a vast open landscape with expansive views. The village and other houses near the river add a cultural component that also contracts with the harshness of the general landscape.

This combination focusses the senses on the river and its associated habitats, making the study area unique to the sub-region, and exerts a strong sense of place.

Views

Visual receptors include people travelling along the R382 and local tracks, residents staying in the village or at the guest farm and tourists passing through the area headed for or returning from the Richtersveld.

Sensitive Viewers

The following receptors were identified as potential sensitive viewers during the site visit.

Potential Sensitivity of Visual Receptors – the Project High Residences in Beauvallon farm village, tourists travelling along the R382 travellers and people staying at the Spogplaas House	**Moderate** Locals travelling through the study area	**Low** Workers on the Beauvallon farm
Visitors of tourist attractions and travelling along local routes, whose intention or interest may be focused on the landscape; 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.	People engaged in outdoor sport or recreation (other than appreciation of the landscape, as in landscapes of acknowledged importance or value); People travelling through or past the affected landscape in cars or other transport routes.	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.

EXPECTED IMPACTS

Also refer to Chapter 6 where impacts are assessed and mitigation measures provided.

The following issues were considered in the assessment phase:

- Public concern for scenic quality of the study area and their perception of what constitutes a sensitive viewing site;
- Determine the visibility of the proposed power transmission lines and sub-station within;
- Determine visual intrusion (contrast) of the proposed power transmission lines and sub-station by simulating its physical appearance from selected sensitive viewing areas;
- Rate the impact of the power transmission line on views from sensitive viewing areas;
- Rate the impact on the scenic quality and sense of place of the study area;
- Establish management measures (mitigation) to reduce the impact of the Project where appropriate.

CONCLUSION OF VISUAL IMPACT STUDY

- Visual issues have not been raised as a major concern by the local community and therefore the sensitivity to the project from this perspective is low.
- The study area already contains a substation and power lines and the proposed new development would be constructed adjacent to these structures. Therefore the main impact of the project is of a cumulative nature and is assessed as such.
- During the Construction Phase the proposed Project will exert a MODERATE negative impact (i.e. the impact is real but not substantial) on the visual and aesthetic environment. Mitigation during this phase is possible but it revolves mainly around 'good housekeeping i.e. suppression of dust at the substation site and along access roads during the construction of the towers.
- The Operational Phase is predicted to exert a MODERATE impact without mitigation. Mitigation is possible, in the form of a tree screen to the east of the substation, during the operational phase but it will not substantially reduce the cumulative impact of the power lines. It will however screen sensitive views from the east to the sub-station. It also must be noted

that the tree screen will not be effective immediately it will have to be established over a number of years before it will effectively contribute to mitigating the visual impact.

The visual impact specialist concluded that the proposed activity should be authorised with the proviso that the proposed management measures are binding to this authorization.

4.5 ENVIRONMENTAL SENSITIVITY

All relevant specialist input is provided in the Environmental Impact Report. The EAP is of the opinion that no information not contained in these reports could change the outcome of the recommendations for the project.

All the specialists concluded that the project could continue with the implementation of mitigatory measures as proposed. The detail impact assessment of these environmental components is provided in Chapter 6, Paragraph 6.3.1.

The following Environmental Sensitivity Maps that provides the key issues are provided in Appendix A:-

SANBI Environmental Sensitivity Maps

(g) Terrestrial CBAs
(h) Threatened Ecosystems
(i) National Protected Areas
(j) National Rivers
(k) Aquatic CBAs
(l) National Wetlands

Environmental Sensitivity

(a) Aquatic and Riparian Area
(b) Fauna and Flora
(c) Avifauna

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 and 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 I&AP's were informed of the project and were allowed the initial opportunity to place their concerns and comment on record.

The Public Participation Process (PPP) followed during the Scoping Phase

Advertisement

- *List of Interested & Affected Parties (I&APs)*
  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 D(8) of this report):-
    - List of Government Departments
    - List of Municipalities
    - List of General Stakeholders
    - List of Directly Affected Landowners

- *First Phase Notification: Distribution of the Background Information Document*
  A Background Information Document (BID) was compiled and distributed via email during the last week of July 2016 to all the stakeholders listed. A 30-day commenting period applied. Both the BID and the proof of distribution of the BID are included in Appendix D(1).

- *Onsite notices*
  5x A2 laminated onsite notices (in both Afrikaans and English) were placed at the following venues - proof is supplied in Appendix D(2) :
    - At the entrance to the existing Oranjemond Substation
    - At the entrance to the Spogplaas Guesthouse
    - At the turnoff to the Namibian border
    - At the Sentra in Alexander Bay
    - At the Post Office in Port Nolloth

- *Newspaper advertisement*
  A newspaper advertisement was placed in Die Plattelander on 15 July 2016 (proof thereof is attached in Addendum D(3).

Focus Group Meetings

Focus Group Meetings were held with the following IAPs:

- The Richtersveld Local Municipality together with the Richtersveld Sida Hub Communal Property Association (CPA) at the Municipality's offices on 19 July 2016. Minutes of this meeting and the attendance register are attached in Appendix D(4).
- Members of the CPA also attended the site visit on 20 July 2016 undertaken by Eskom and the specialists appointed for this project. The attendance register is attached in Appendix D(4).
- A site meeting was held with a representative of the landowner of Pico Eco Farm CC on 21 July 2016.

Distribution of the Draft Scoping Report

The Draft Scoping Report was distributed for a 30-day commenting period as follows:

- Hard and electronic copies of the Scoping Report were delivered to the
    - National Department of Environmental Affairs: Integrated Environmental Authorisations. The Application Form will also be submitted in order to register the project with DEA.
    - National Department of Environmental Affairs: Biodiversity Section
    - Northern Cape Department of Environmental Affairs & Nature Conservation
    - Northern Cape Department of Agriculture, Forestry and Fisheries
    - Richtersveld Local Municipality
    - Department of Water Affairs & Sanitation
    - Richtersveld Sida Hub Communal Property Association
- All registered Interested and Affected Parties received an electronic copy of the Draft BAR where possible.
- The Draft Scoping Report was linked to the SAHRIS website of the South African Heritage Resources Agency (SAHRA) for their perusal and comment.

The Draft Scoping Report was submitted to Eskom for verification as well as to the legal specialist for a legal review.

Final Scoping Report

Comments received on the Draft Scoping Report (inclusive of the legal review) were incorporated into the Final Scoping Report. The Final Scoping Report was approved by DEA on 17 January 2017.

The Public Participation Process (PPP) followed during the EIR Phase

Public Meeting

A Public Meeting was held in Alexander Bay on 16 November 2016. The objectives of the meeting were

- To communicate the details of the project
- To communicate the proceedings, findings and recommendations of the Environmental Impact Assessment process
- Communicate the findings and recommendations of the specialists
- To enable informed discussion with and comment from stakeholders.

A site visit was also held afterwards. The minutes and attendance register are included in Appendix D of this document.

Deviation from the Plan of Study occurred in terms of the Public Participation Process. It was initially proposed to have two Public Meetings; in Alexander Bay and Port Nolloth respectively. On communication with the registered stakeholders in Port Nolloth it was confirmed that one Public Meeting in Alexander Bay combined with a site visit is more sensible and practical.

Distribution of the Draft Environmental Impact Report

The Draft EIR was distributed for a 30-day commenting period as follows.

- Electronic copies on CD of the Report were couriered to the
    - National Department of Environmental Affairs: Biodiversity Section
    - Northern Cape Department of Environmental Affairs & Nature Conservation
    - Northern Cape Department of Agriculture, Forestry and Fisheries
    - Richtersveld Local Municipality
    - Department of Water Affairs & Sanitation
    - Richtersveld Sida Hub Communal Property Association
- All registered Interested and Affected Parties received an electronic copy via email of the Draft EIR where possible.
- The Draft EIR was linked to the SAHRIS website of the South African Heritage Resources Agency (SAHRA) for their perusal and comment.

The Draft EIR was submitted to Eskom for verification as well as to the legal specialist for a legal review.

Comment received on the Draft EIR is addressed in the Final EIR (this document) in paragraph 5.4.3 below. 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 Alternative 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.

Comments & Responses Report: Scoping Phase

Apart from comment raised during the focus group and public meetings, all correspondence was received, and responded to, via email.

5.3 ISSUES RAISED DURING THE SCOPING PHASE

5.3.1 KEY ISSUES RAISED DURING THE FOCUS GROUP MEETING

Richtersveld Local Municipality and the Richtersveld Sida Hub Communal Property Association
Also refer to the attendance register and minutes of the meeting attached in Appendix E(4)
The purpose of the meeting was to introduce the municipality and the CPA to the proposed project, the EIA process and the way forward. It was explained that they should give their input and raise their concerns. All reasonable actions must be undertaken to address their concerns directly relevant to the project. A project description was also provided.

The main issues raised were as follows:

- Communication during a previous EIA undertaken in the area was not sufficient, because no one has yet liaised with them with regards to compensation.
- The CPA is a very important stakeholder because of the fact that they lodged a land claim on the property on which the Eskom project is proposed.
- The CPAs attorneys must be invited to all future meetings.
- The CPA is a community within the municipality and that social impact on them should be considered. The CPA currently uses a portion of the land upstream of the project site for grazing purposes for their sheep and goats.
- The CPA had some irrigation activities upstream but that they have had problems with Eskom and the power supply was cut off.
- Eskom should consider employing local people for the construction period of the project.
- The CPA does have two water abstraction points upstream of the proposed project area. These are flotation pumps and the water was abstracted for household and irrigation purposes. There is however no Eskom power supply at the moment and water cannot be abstracted.
- Numerous canoe operators use the river much further upstream and the canoe trips end at the confluence with the Fish River. The proposed project should therefore not impact negatively on this tourism activity.

Response from Landscape Dynamics

- *Continues liaison with the CPA is taking place in order to ensure that their concerns are being addressed throughout the EIA process.*
- *Servitude negotiations and compensation can only commence once Environmental Authorisation has been obtained.*
- *The existing registered landowner of the Remainder of the Farm Groot Derm 10, Namaqualand RD is Pico Eco Farm CC (contact person: Mr FAM Gomes).*
- *The lawyer of the CPA's contact detail was added to the I&AP register*
- *This meeting was the first step in the Public Participation Process. The CPA and the Municipality will be invited to attend a Public Information Meeting in due course. They would also be offered the opportunity to comment on the Draft Scoping Report as well as on the Draft*

Environmental Impact Report. Once Environmental Authorisation had been obtained, they will also be notified of this and will be offered the opportunity to appeal if necessary.

5.3.2 WRITTEN COMMUNICATION DURING THE INITIAL ADVERTISING PERIOD UP TO THE DISTRIBUTION OF THE DRAFT SCOPING REPORT

Attorneys for the CPA: Mr Duncan Korabie
Project detail was emailed to Mr Korabie and he requested an update regarding the status of the EIA.

Response from Landscape Dynamics
The EIA process just commenced, which was kicked-off by the first round of public participation. Mr Korabie's comment, if any, during this stage will be appreciated so that concerns can be addressed as early as possible in the assessment process.
No further comment was received from Mr Duncan.

SANRAL: Environmental Coordinator: Ms Nicole Abrahams
She requested that a locality and detailed route map be forwarded to her.

Response from Landscape Dynamics
The requested maps were forwarded to her but no further comment was received.

Endangered Wildlife Trust, Field Officer: Orange River Mouth, Source to Sea Programme: Mr Grant Smith
He requested to be updated during the EIA process

Response from Landscape Dynamics
Mr Smith is on the I&AP register and will receive all communication regarding this project.

Umkalu Safari & Canoe Trails: Zahn du Toit
It was requested that the correct contact person should be added to the I&AP register.

Response from Landscape Dynamics
Their contact details were updated on the I&AP register.

Commission of Restitution of Land Rights: Office of the Regional Land Claims Commissioner: Northern Cape
It was confirmed that there is restitution lodged against the Groot Derm settlement and that the claim is valid.

Response from Landscape Dynamics
Comment noted

Department of Agriculture, Forestry and Fisheries: Designation: Chief Forester (NFA Regulation): Directorate: Forestry Management (Other Regions) Northern Cape, Ms Jacoline Mans
This Department is responsible for implementation of the National Forests Act and the National Veld and Forest Fires Act. The development should take note of Section 12(1), Section 15(1) and Section 58(1) of the NFA. The list of protected tree species under Section 12(1) was published in GN1161 November 2105.

The riparian vegetation is declared as endangered and it may contain protected trees. Should any of these tree species be affected by the proposed development, an application must be made for a Forest Act Licence from DAFF.

Response from Landscape Dynamics
This licence requirement will be included in the EMP.

5.3.3 COMMENT RECEIVED ON THE DRAFT SCOPING REPORT

Northern Department of Environment and Nature Conservation (Cape Research and Development Support Section), Springbok Office
Mr Peter Cloete confirmed that the DENC Research and Development Support Unit will only provide comment on permit applications. He supplied the contact details of the DENC Permit unit in Kimberley and provided the internet links to the relevant legislation, permit application, payment requirements and agreements.

Response from Landscape Dynamics
The permit requirement and relevant input required by the DENC will be included in the Environmental Management Plan that will form part of the Environmental Impact Report.

The South African Heritage Resources Agency
The SAHRA Archaeology, Palaeontology and Meteorites (APM) Unit accepts and promotes the recommendations in the Heritage Impact Assessment. They require that the following conditions (in addition to the requirements of the HIA) be incorporated in the Environmental Management Plan for the project :

- The walk-down study must be conducted prior to the construction phase of the development. A Walk-down Report detailing the results of the walk-down must be submitted to SAHRA for comment prior to the commencement of the construction phase. No work may commence without comments from SAHRA.
- The Final Scoping Report and all appendices must be submitted to the case file once submitted to DEA.
- The Environmental Impact Report and all appendices must be submitted to the case file once submitted to DEA.

- If any evidence of archaeological sites or remains (e.g remnants of stone-made structures, indigenous ceramics, bones, stone artefacts, ostrich eggshell fragments, charcoal and ash concentrations), fossils or other categories of heritage resources are found during the proposed development, SAHRA APM Unit (Natasha Higgit / Johan Gribble 021 462 4502) must be alerted immediately. A professional archaeologist or palaeontologist, depending on the nature of the finds, must be contracted as soon as possible to inspect the findings. If the newly discovered heritage resources prove to be of archaeological or paleontological significance, a Phase 2 rescue operation may be required.
- Should the proposed development be granted an Environmental Authorisation, SAHRA must be informed and the decision letter must be updated to the case file.

Response from Landscape Dynamics:
All the above requirements will be included in the Environmental Management Plan that will form part of the Environmental Impact Report.

The South African National Roads Agency
Ms Reneé de Kock enquired as to whether the N17 would be affected.

Response from Landscape Dynamics:
She was informed that it is not affected.

Mr Morne Stroh on behalf of Mrs Melanie Stroh, the recently appointed Farm Manager and Pico Eco Farm/ Grootderm Farm legal proxy
- Mr Stroh confirmed that Mr F Gomes resides in Macau, China and that is it difficult to obtain immediate feedback from him and that English is not his first language; therefore he appointed Ms Stroh as his Farm Manager.
- He enquired about a meeting held on his farm between Eskom and Mr Gomes. They requested a synopsis of the discussions.
- He confirmed that Pico Eco Farm and its owner and management are keen conservationists and that they might have questions with regards to the findings of the Scoping Report.

Response from Landscape Dynamics:
It was confirmed that the Scoping Report wrongfully stated 'a site meeting was held with the landowner'. It should have read 'a site meeting was held with a representative of the landowner'. This has now been corrected.

Mr Stroh was provided with a synopsis of the communication between AMPPRO (appointed to liaise with the landowners during the EIA process). The key issues are the following :-
- *Ms M Duvenage and Ms A Botha from AMPPRO met with Mr Alves on 19/07/2016. He gave a brief explanation of his relationship and arrangement with Mr Gomes to farm on the remainder of Groot Derm 10.*
- *AMPPRO communicated the scope of the project as well as the EIA process with him*
- *Mr Alves raised his concerns with regards to the lack of electricity on the property and informed that there were some forms of negotiations in progress with Eskom where a water extraction point will be provided for Eskom's trees in return for an electricity point on the property.*
- *Permission was granted by Mr Alves for the EIA specialists to gain access to the property.*
- *On 20/07/2016, the relevant EIA specialists, the Eskom engineers and project manager,*

members of the CPA and Mr Alves met on site. The project was discussed and the extent of the substation was pointed out as well as the approximate locality of the EIA corridor.

- *Mr Alves gave Ms Duvenage a brief tour of the activities on the farm.*
- *A walk down of the proposed 2 x 400kV power lines servitude was conducted by the specialists.*
- *AMP met with Ms Annmarie and Ms Salome Reck at the guesthouse. The meeting provided an opportunity to introduce them to the proposed project and to establish whether they had any concerns with regards to the proposed development. It became clear that their greatest concern was the lack of electricity on the farm, and that the new power lines did not pose any problems to them. They did confirm again that it was difficult to get hold of Mr Gomes and that Mr Loreson and Mr Alves where probably the most appropriate representatives.*

5.3.4 CONCLUSION OF PUBLIC PARTICIPATION DURING THE SCOPING PHASE

Even though the project was advertised widely as described above, very little comment was received and no objections to the project as proposed were made.

The main issue identified is that the social environment has some sensitivity in terms of the current land claim on the property and the cultural heritage of the greater community.

Comments & Responses Report: Environmental Impact Phase

5.4 ISSUES RAISED DURING THE EIR PHASE

5.4.1 KEY ISSUES RAISED DURING THE PUBLIC INFORMATION MEETING AND SITE VISIT

The following issues were raised during the Public Meeting:-

Mr Michael Stroh wanted to know what would happen to the existing 66kV line that crosses the river.
Response : Mr Fick Booysen from Eskom stated that it will remain in place.

Mr Herman van der Bergh wanted to know when the project will be constructed.
Response : Mr Booysen stated that all authorisations and designs should be completed over the following two years. Construction might commence in 2019 at the earliest.

Ms Melanie Stroh enquired if there was any way that the project could supply power to their farm.
Response : Mr Booysen said the proposed project is a transmission project; therefore the request should be referred to the local distribution network office of Eskom. He undertook to provide the relevant information to Ms Stroh.

Mr Ruway Baulackey from the Land Claims Commissioner enquired as to which properties are involved with the proposed project.
Response : The relevant properties are the Remainder of the Farm Groot Derm 10, Namaqualand RD which is affected by the proposed two new powerlines as well as Portion 4 of the Farm Groot Derm 10, Namaqualand RD on which the existing Oranjemond Substation has been constructed and on which the extension is planned.

Mr Baulackey also wanted to know who would benefit from this project and he questioned why the local community does not have any power.

- *Mr Booysen explained that the power is purchased from Nampower to strengthen the national grid, which eventually trickles down to local usage.*
- *Ms Anne-Marie Botha from AMPPRO stated that the power supply to the local community was cut because they did not pay their outstanding account with Eskom.*

It was requested that the impact on the environment be explained.
Response : Ms Nel referred back to the slideshow with the summaries of the specialist studies as summarised under Paragraph 3 above. She stated that is was concluded that the impact on the environment would be acceptable with the proposed mitigatory measures in place.

The question was raised as to who would ensure that mitigation and rehabilitation takes place as proposed.

Response : The mitigation and rehabilitation measures would form part of the conditions of the Environmental Authorisation which is legally binding to Eskom SOC Limited as the project applicant. The Environmental Management Plan that would include these measures and conditions will also be available to the local community who could assist in confirming compliance.

Mr Peter Cloete from the Department of Environment and Nature Conservation stated that there are roosting areas of bats in close vicinity to the project area. He requires that the impact on bats be investigated in the report. Ms Jacoline Mans from the Department of Agriculture, Forestry and Fisheries wanted to know what the impact of the proposed OWL devices would be on the bats, since insects are normally attracted to light in the dark which will attract the bats to the lines.
Response: Mr Cloete was requested to forward the roosting sites of the bats to Landscape Dynamics. The EWT was contacted in this regard. There comment is provided under the relevant heading in Paragraph 5.4.2

Ms Jacoline Mans was concerned about the bush clearing in the riparian areas specifically that could be required for the two powerlines.

Response :
Ms Nel explained that on the South African side the last pylon will be placed on the hill above the river, not affecting the riparian area at all. On the Namibian side it would be placed between the riparian edge and the buffer zone. This is also the reason why water use authorisation is required from the Department of Water and Sanitation.

The question was raised as to what the impact of the Vioolsdrift Dam which is planned upstream would be on the powerline.
Response : Mr Booysen explained that the proposed project is way outside the influence sphere of the proposed dam. The Department of Water and Sanitation will release water from the dam in a controlled manner which must comply with the flood requirements of the Orange River. The pylons will remain on dry land.

Ms Jacoline Mans enquired about the difference between the vegetation units in the freshwater study and the vegetation study respectively.
Response : These two relevant specialists would be contacted to address the comment supplied by Ms Mans and their reports would be updated accordingly if and where required. Please refer to the responses under the relevant heading in Paragraph 5.4.2 below.

The Minutes of the Public Meeting, included in Appendix D(8), was distributed for perusal and comment with an invitation to provide written comment within the following two weeks. No further comment regarding the project as a result of the information communicated at the Public Meeting had been received.

5.4.2 COMMUNICATION DURING THE EIR PHASE

Correspondence took place with the following stakeholders :-

- The South African Heritage Resources Agency
- The Department of Agriculture, Forestry and Fisheries (Directorate Forestry Management Northern Cape)
- Endangered Wildlife Trust
- The Commission on Restitution of Land Rights

The South African Heritage Resources Agency, APM Unit
SAHRA Archaeology, Palaeontology and Meteorites (APM) Unit confirmed they accept and support the recommendation by Prof Anton van Vollenhoven of Archaetnos (Cultural Heritage Impact Study included as Appendix C(6). They requested that the following conditions be included in the Environmental Management Plan:-

- The walk-down study must be conducted prior to construction and a Walk-down Report must be compiled and submitted to SAHRA for comments prior to commencement of construction.
- The EIA and all appendices must be submitted to the case file once submitted to DEA.
- If evidence of archaeological sites or remains (e.g. remnants of stone-made structures, indigenous ceramics, bones, stone artefacts, ostrich eggshell fragments, charcoal and ash concentrations), fossils or other categories or heritage resources are found during the proposed development, SAHRA APM Unit (Natasha Higgitt / John Gribble tel 021 462 4502) must be alerted immediately. If unmarked human burials are uncovered, the SAHRA Burial Grounds and Graves (BGG) Unit (Itumeleng Masiteng / Mimi Seetelo Tel 012 320 8490) must be alerted immediately. A professional archaeologist or palaeontologist, depending on the nature of the finds, must be contracted as soon as possible to inspect the findings. If the newly discovered heritage resources prove to be of archaeological or palaeontological significance, a Phase 2 rescue operation may be required.

- Should the proposed development be granted an Environmental Authorisation, SAHRA must be informed and the decision letter must be uploaded to the case file.

Response from Landscape Dynamics:
The Final EIR will be loaded on the case file as soon as submitted to DEA for authorisation. All the other requirements had been included in the Environmental Management Plan.

The Department of Agriculture, Forestry and Fisheries (Directorate Forestry Management Northern Cape)
Ms Jacoline Mans, Chief Forester : NFA Regulation, commented as follows :-

Comments on the Draft Scoping Report

- Page 42 of the DSR refers to the affected vegetation types and mentioned two types, namely Western Gariep Lowland Desert (Dn4) and the Lower Gariep Alluvial Vegetation (Aza3). However, page 9 of the Aquatic Ecological Impact Assessment refers to four (4) affected vegetation types. The two types already mentioned, as well as Arid Estuarine Salt Marshes (Aze1) and Western Gariep Plains Desert Vegetation Type (Dn3). Clarification is requested.
- Page 47 of the Draft Scoping Report (DSR) and Page 42 of the Ecological Report stated that "No alien plants were identified on site'', but the second paragraph on Page 62 of the DSR refers to "tall trees (mostly alien vegetation)". Page 3 also stated at the bottom of the page that tall trees, mostly Eucalyptus occur along the southern banks of the river. Page 23 of the Aquatic Ecological Impact Assessment stated that 'vegetation in the study area is still largely natural with minimal invasive alien plant growth''. Clarification was requested.

Comments on the Ecological Report on the Fauna & Flora

- Page 24 refers to ''….alien invasive *Tamarix usneoides* and *Salix babylonica* in some areas..''. *Tamarix unsneoides* is an indigenous tree species (National Tree number 487) occurring naturally on the banks of the Orange River and often associated with the endangered Lower Gariep Alluvial Vegetation type. It should not be confused with the exotic *T. Ramosissima* (X743) which is a declared invader also found in the Orange River riparian zone. It was requested to amend the report by correcting the statement. *Tamarix usneoides* is not exotic, nor is it an invader.''
- Page 24 refers to alien *Salix babylonica* (X258). *Salix babylonica* must not be confused with the indigenous *Salix mucronata* (Tree Nr 36) also found on the banks of the Orange River. Impacts on indigenous riparian vegetation associated with the Endangered Lower Gariep Alluvial Vegetation must be minimised.
- Page 40 of the report refers to tree species associated with the Lower Gariep Alluvial Vegetation type. *Euclea pseudebenus* was mentioned. It should be noted that E. pseudebenus is protected under the National Forests Act, Act 84 of 1998 and may not be damaged or disturbed without a valid Forest Act License from the Department of Agriculture, Forestry and Fisheries (DAFF).

Response from the relevant specialists, Dr Leslie Brown and Dr Tonie Belcher:

Draft Scoping Report

- It should be noted that two different specialist reports have reference, namely the Aquatic Ecological Impact Assessment which focused on the riparian area, as well as the Ecological Report on the Fauna & Flora focusing on the study area outside the riparian zone.

The two specialist reports had been amended to clarify the concerns as follows (these clarifications had also been integrated in the EIR):-

Ecological Report on the Fauna & Flora (Dr Leslie Brown)

- In terms of the Ecological Report on the Fauna & Flora and the relevant study area, there are only three vegetation types present in the study area namely Western Gariep Lowland Desert (Dn4); Lower Gariep Alluvial Vegetation (Aza3) and Arid Estuarine Salt Marshes (AZe1). The latter became part of the study area once it was enlarged and forms part of the Aquatic assessment report. The Western Gariep Plains Desert Vegetation (Dn3) does not occur in the study site. The general description of the AZe1 vegetation type has now been included in the final report.
- The only alien plant species found to be present with the vegetation and fauna ecological study was *Salix babylonica.* The tree is a category 2 invader according to CARA, but not listed by NEMA. It is included in the final report. It might be true that other alien species are present along the riverine area, but although not found in this study it will not change or affect the results of the study.
- *Tamarix usneoides* is indeed not an invasive woody species, it was a typo error that was corrected.
- *Salix babylonica* was not confused with *S. mucronata*, the latter being an indigenous species along riverine areas throughout South Africa.
- *Euclea pseudebenus* was NOT found to be present on site, it was ONLY listed as being characteristic of the Lower Gariep Alluvial Vegetation (Aza3) vegetation type as described by Mucina & Rutherford (2006). Thus it is irrelevant that it is a protected species and has no reference to the report. If found to be present on site it would obviously trigger a permit due to its protected status.

Aquatic Ecological Impact Assessment (Dr Toni Belcher)

Clarification was made in this report in terms of the following :-

- Within the corridor the vegetation is still largely natural. Immediately upstream is the agricultural area with the tall *Eucalytus* trees and other alien plants.
- The Western Gariep Plains Desert Vegetation is indicated in the report as being further south of the corridor (and not in the corridor itself).
- The *Tamarisk* and *Salix* are indicated in the report as commented on. The *Tamarisk* species identified at and upstream of the site was the indigenous *Tamarix usneoides* and the *Salix* species was the invasive *S. babylonica* that occurred together with the taller trees upstream of the corridor and was not the indigenous *S. mucronata*.

Endangered Wildlife Trust (EWT)

Mr Grant Smith, Field Officer of the Orange River Mouth (Source to Sea Programme), requires that river bird diverters should be non-negotiable on the shield/earth wires and there should be OWL devices fitted for the flamingo's.

Response from Landscape Dynamics:

The requirement for bird flight diverters with OWL devices on the shield/earth wires is included in the Environmental Management Plan.

It should be noted that the potential impact of OWL devices on the bat population was raised during the Public Meeting. Mr Peter Cloete from the Department of Environment and Nature Conservation stated that there are roosting sites of the bats in close vicinity to the project area. He requested confirmation as to the impact the OWL devices could have on the bats, since insects are attracted to light and these insects will attract bats. Mr Smith from the EWT was subsequently contacted and he confirmed the following :

- *The OWL device is fitted with a flashing light, so not all insects will be attracted. It is the same as a flashing road marker that is sometimes used by SANRAL in poor visibility situations.*
- *Bats do not collide with static objects. There is no record in the EWT database of bat collisions with power lines.*
- *If the concern is that bats will be attracted to the lights due to insects which would disrupt their regular feeding regime, it would be required to assess this risk for every light that is switched on at night, which for obvious reasons are not viable.*
- *In summary, the EWT has considered the matter and concluded that there is no concern from their side.*

The Commission on Restitution of Land Rights

Different reports as to the status of the land claim on Portion 4 and the Remainder of the Farm Grootderm 10, Namaqualand RD were received. The following documentation was supplied by the Regional Land Claims Commissioner : Northern Cape :

27/07/2016 No restitution lodged
02/08/2016 Restitution lodged, valid claim
08/11/2016 No land claims on database
09/11/2016 Restitution lodged, valid claim

Ms Maritha Duvenage (AMPPRO on behalf of Landscape Dynamics) investigated the matter. It was subsequently confirmed that there is a valid claim from the Richtersveld Community on the two properties concerned and that a notice has been gazetted on 29 August 2008 with reference number KRK6/2/2/A/1/0/0/37(R323). The notice in the gazette states "…has been submitted to the Regional Land Claims Commissioner for the Free State and Northern Cape and that the Commission on Restitution of Land Rights will further investigate the claims in terms of the provisions of the Act, as amended in due course.'' No further documentation regarding these claims could be supplied.

Response from Landscape Dynamics:

A condition is included in the Environmental Management Plan that Eskom must adhere to all legal requirement in terms of the said claims on the properties at the time that the servitude and land use are confirmed and registered.

It should be noted that the following stakeholders who are key in terms of these claims had form part of the Public Participation Programme for the project (contact details and proof of communication are supplied in Appendix D of the EIR:

- *The Registered Landowner of the Remainder of the Farm Groot Derm 10, Namaqualand RD:*
  - *Pico Eco Farm CC, Mr FAM Gomes*
  - *On behalf of Mr Gomes who lives overseas - the Farm Manager: Ms Melanie Stroh and her assistant, Mr Morné Ströh*
- *The Registered Landowner of the Oranjemond Substation on Portion 4 of the Farm Groot Derm 10, Namaqualand RD : Eskom Group Capital, Regional Land Portfolio Managers Eskom Properties, Ms Bronwyn Stolp and/or Ms Tinkie Holl*
- *Department of Rural Development & Land Reform, Office of the Regional Land Claims Commissioner, Northern Cape, Chief Director, for attention: Ms Mangalane du Toit, Nqabisa Mkalipi (Senior Communication Officer); Mr Ruwayda Baulackey (contact person of the CPA); Ms Cindy J Benyane; Nqabisa Mkalipi and Ms Darlit Esterhuizen*
- *The Richtersveld Sida Hub Communal Property Association, the Chairperson Ms Lydia S Obies; Mr Pieter de Wet; Ms Anna Gewers; Mr Jacobus Farmer and Mr Jan de Wee*
- *Attorney for the CPA: Mr Duncan Korabie*

No objection with regards to the proposed project was raised and/or documented. The CPA however requested continuous communication with them throughput the EIA process and all phases of the project (planning/design, construction and operational phases of the project)

Mr Moketla Mamabolo Attorney who is also responsible for the legal review of the project, advised the following:

- *Once a notice of the claim in respect of any land had been published in the Gazette, specific restrictions apply that includes that no person may sell, exchange, donate, lease, subdivide, rezone or develop the land in question without having given the regional land claims commissioner one months' written notice of his or her intention to do so. The Regional Land Claims Commissioner has 30 days in which to approach the court for an interdict. (This requirement is also included in the EMP)*

From a legal point of view, nothing is contained in the Act to preclude the Environmental Impact Assessment process to run its course, however, the notification step to the Regional Land Claims Commissioner is of fundamental importance that it be issued as required by the Act.

5.4.3 COMMENT RECEIVED ON THE DRAFT ENVIRONMENTAL IMPACT REPORT

Gravity Adventures: Marie-Louise & Andrew Kellet

The project won't impact on their business, but she is concerned about the impact of the project on the IBA at the mouth of the Orange River.

Response
Mitigation measures as proposed in the EMP would ensure the projection of the avifauna in the area.

SANRAL: Environmental Coordinator: Ms Nicole Abrahams
They requested to be registered as an IAP and required the locality map.

Response
Ms Abrahams was referred to her email dated 8 August 2016 and our reply on the same date, in which the following was stated:
"Attached please find a locality map which should indicate the position of the site in relation to the wider environment better than the previous map provided.
The closest tar road would be the R382 between Port Nolloth and Alexander Bay. Just after Alexander Bay a gravel road runs along the river towards the site."

As requested, SANRAL was registered as an IAP and will therefore receive all correspondence regarding this project.

Department of Rural Development & Land Reform, Office of the Regional Land Claims Commissioner: Mr Solomon Maruma
They referred the email regarding the availability of the EIR to their Northern Cape office.

Response
Apart from the correspondence received during the Scoping Phase as described above, no further comment from the Department of Rural Development & Land Reform, Office of the Regional Land Claims Commissioner was received.

5.4.2 CONCLUSION OF PUBLIC PARTICIPATION DURING THE EIR PHASE

Minimal comments and issues were raised during the Public Participation Process. The comments and issues received 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 EAP is of the opinion that the public participation was thoroughly conducted and all stipulations as per the EIA Regulations, 2014 were followed.

CHAPTER 6: IDENTIFIED IMPACTS 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 LIST OF IMPACTS ASSOCIATED WITH THE DEVELOPMENT

6.2.1 EXPECTED NEGATIVE IMPACTS

Direct (Primary) Impacts

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

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

Construction Phase:

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

During Operational Phase:

- Impact as a result of Eskom inspections and maintenance, i.e. on habitat destruction (pollution, removal of plant species; placement of snares, etc.)
- Impact on avi-fauna –collisions and electrocution
- Visual impact – cumulative impact

6.2.2 EXPECTED POSITIVE IMPACTS

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

- This proposed Kudu Power Station (PS)- Oranjemond 1st and 2nd 400kV Lines project provides a transmission solution for the proposed Kudu Gas Power Station in Southern Namibia. The power station will be producing 885 MW power that will be evacuated via the NamPower and Eskom Transmission works.
- 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 Kudu Power Station (PS)- Oranjemond 1st and 2nd 400kV Lines project is planned in a legal, pro-active and structured manner taking all development components, potential and restrictions into account;
- The project will provide some, however limited, employment and training opportunities, during the construction phase of the project development.

6.3 PROPOSED MANAGEMENT OF IMPACTS AND MITIGATION

6.3.1 ENVIRONMENTAL IMPACT ASSESSMENT TABLE

The Environmental Impact Assessment Table includes a description of expected impact on the different environmental components; as well as proposed mitigation measures (which are also included in the Environmental Management Plan).

Impacts were also evaluated and assessed in terms of 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*

PLANNING PHASE (ROUTE SELECTION AND DESIGN OF LINE AND SUBSTATION)

Aquatic & Riparian Vegetation Impact

Impact Description :

- *The Orange River is in a largely modified ecological state with a high ecological importance and sensitivity. There must be no further deterioration in river condition for this section of river.*
- *Potential impact which could be avoided by proper planning and design during the pre-construction phase are :*
    - *Direct modification or loss of aquatic habitat*
    - *Potential flow impact*
    - *Water quality impact*
- *Disturbance of habitat and possibly some very limited surface water runoff and water quality impacts could occur.*
- *Loss of biodiversity & habitat could occur.*

Mitigation :

- *Water Use Authorisation in terms of the National Water Act (Nr 36 of 1998) is required for the crossing of the river. The Risk Assessment Matrix provided by the Department of Water and Sanitation was used in the assessment of the risk posed to the aquatic ecosystems by the proposed project. It was concluded that the proposed activities pose a low risk to the aquatic ecosystems for both the Construction and Operational & Maintenance Phases of the project.*
- *The regulation relating to General Authorisations for Section 21 (c) and (i) water uses has been revised so that General Authorisation in terms of the Water Act could therefore be relevant to this project because of the low risk rating.*
- *The pylons must be constructed within the recommend buffer but not within any of the mapped riparian zone (as per Appendix C(2)(b). The overhead powerlines may however cross over the buffer zones and the river.*
- *Construction activities should occur outside of the delineated aquatic features and the proposed buffer zones. These areas should be marked as no-go areas prior to construction.*
- *Small drainage features also drain the hillside south of the river. These features do not drain into the river and do not provide any aquatic habitat of significance but simply provide a conduit for water draining the steep bank south of the Orange River. These drainage lines*

should preferably be avoided. If this is not avoidable the impact would be negligible however the impact to the runoff in the drainage line would need to be mitigated.

- *The expansion of the substation should preferably take place to the south and east of the existing substation as this would be further from the drainage feature to the west of the substation.*

Impact Assessment :

Impact Description	Significance Without Mitigation	Extent	Duration	Probability	Magnitude / Intensity	Significance After Mitigation
Poor planning ito the Orange River and drainage lines	Moderate	Local	Temporary	Possible	Moderate	Low

Terrestrial Flora Impact

Impact Description :
Impact associated with powerlines that could be prevented with proper planning and implementation of mitigation measures :

Impacts on vulnerable species

For the purpose of the EIR the term "vulnerable species" refer to threatened, protected, medicinal and red data species. Natural populations of species not regarded as "vulnerable" usually occur in large numbers within various suitable habitats. Vulnerable species are normally species whose habitats have become smaller, usually as a result of human actions, but also as a result of natural disasters (e.g. floods, droughts, fire etc.). The result is that these species are already under stress and any further reduction in their habitat could cause their extinction. Not only will the loss of such a 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.

Mitigation :

- *A site walk-down with the ecologist is required once the pylon positions have been determined.*
- *A Plant Rescue & Protection Management Plan must be compiled to confirm the permitting requirements of the Northern Cape Department of Environment and Nature Conservation to ensure compliance with the Northern Cape Provincial Act (Act 9 of 2009). Emphasis must be placed on the area to the east of the existing substation where the expansion of the substation will take place.*

Impact Assessment :

Impact Description	Significance Without Mitigation	Extent	Duration	Probability	Magnitude / Intensity	Significance After Mitigation
Impact on flora resulting from poor planning	Moderate to low	Local	Short-Medium term	Possible	Low	Low

Cultural-Heritage Impact

Impact Description :
No sites of cultural heritage significance were located in the surveyed area. Many stone tools have however been noted.

Mitigation :

- *A site walk-down with the cultural-heritage consultants is required once the pylon positions have been determined. The way forward in terms of further action in terms of the stone tools will be determined during this survey. The latter would aim at collection a representative sample of stone tools from the area since it is terra incognito as far as research goes and would therefore assist in elucidating this part of history.*
- *It should always be realized that the subterranean presence of archaeological and/or historical sites, features or artefacts is a distinct possibility.*

Impact Assessment :

Impact Description	Significance Without Mitigation	Extent	Duration	Probability	Magnitude / Intensity	Significance After Mitigation
Impact on stone tools	Low	Site	Permanent	Possible	Low	Very low

Visual Impact

Impact Description :

- *Mitigation measures to reduce the visual impact of transmission lines are difficult and costly after the alignment has been determined. To this end, the most effective mitigation measure was to avoid conflict areas wherever possible and also to integrate mitigation measures in the design and costing of the project.*
- *Screening measures from sensitive viewing areas are difficult to achieve and it's a moot point as to whether visual issues are a concern of the community. Mitigation of any significant kind is not achievable during the operational phase.*
- *Light pollution :- Even though there are light at night in areas of the study site, light pollution should still be seriously and carefully considered and kept to a minimum. Security lighting should only be used where absolutely necessary and carefully directed.*

Mitigation :

- *It is suggested that trees should planted along the eastern side of the substation. The trees will partially shield / screen the view of people living east of the project site.*
- *The negative impact of night lighting, glare and spotlight effects, can be mitigated using the following methods:*
    - *Install light fixtures that provide precisely directed illumination to reduce light "spillage" beyond the immediate surrounds of the substation.*
    - *Light public movement areas (pathways and roads) with low level 'bollard' type lights and avoid post top lighting*
    - *Avoid high pole top security lighting along the periphery of the substation site*

and use only lights that are activated on movement at illegal entry to the site.

- *Use security lighting at the periphery of the site that is activated by movement and are not permanently switched on.*

Impact Assessment :

Impact Description	Significance Without Mitigation	Extent	Duration	Probability	Magnitude / Intensity	Significance After Mitigation
Visual impact	Moderate	Site and Local	Permanent	High	Low	Moderate-Low

Impact on Landownership and Land Claim

Impact Description :

It was confirmed that there is a valid claim from the Richtersveld Community on the two properties concerned and that a notice was gazetted on 29 August 2008 with reference number KRK6/2/2/A/1/0/0/37(R323). The notice in the gazette states "…has been submitted to the Regional Land Claims Commissioner for the Free State and Northern Cape and that the Commission on Restitution of Land Rights will further investigate the claims in terms of the provisions of the Act, as amended in due course.''

Moketla Mamabolo Attorneys advised the following:

- *Once a notice of the claim in respect of any land had been published in the Gazette, specific restrictions apply that includes that no person may sell, exchange, donate, lease, subdivide, rezone or develop the land in question without having given the regional land claims commissioner one months' written notice of his or her intention to do so. The Regional Land Claims Commissioner has 30 days in which to approach the court for an interdict.*
- *From a legal point of view, nothing is contained in the Act to preclude the Environmental Impact Assessment process to run its course, however, the notification step to the Regional Land Claims Commissioner is of fundamental importance that it be issued as required by the Act.*

Mitigation :

- *Eskom must notify the Regional Land Claims Commissioner of the intent to develop the property, as per advice in the previous paragraph.*
- *Eskom must ensure that all legal requirement in terms of the land claim is met.*

Impact Assessment :

Impact Description	Significance Without Mitigation	Extent	Duration	Probability	Magnitude / Intensity	Significance After Mitigation
Land claim issue	Low	Local	Permanent	Probable	Moderate	Very low

CONSTRUCTION PHASE

Increased risk for groundwater pollution

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

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, vapour 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.*

Impact Assessment :

Impact Description	Significance Without Mitigation	Extent	Duration	Probability	Magnitude / Intensity	Significance After Mitigation
Groundwater pollution	Moderate	Local	Medium – long term	Possible	Moderate	Low

Increased risk for erosion

Impact Description :
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.

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.*
- *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 – however not expect for this project site.*
- *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.*
- *Any of the cleared areas that are not hardened surfaces should be rehabilitated after construction is completed by re-vegetating the areas disturbed by the construction activities with suitable indigenous plants. Invasive alien plant growth occurring within the immediate area of the construction activities should be removed and any regrowth prevented.*

Impact Assessment :

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

Aquatic & Riparian Vegetation Impact

Impact Description :

- *Direct modification or loss of aquatic habitat*
- *Potential flow impact*
- *Water quality impact*

Mitigation :

- *All conditions of the Department of Water and Sanitation in the Water Use License or General Authorisation (whichever is applicable) must be implemented and adhered to.*
- *Direct modification or loss of aquatic habitat*
  - *As far as possible existing access roads should be utilised to minimise the extent of disturbance in the area. Access roads should be contoured along any steep slope. Run-off over the exposed areas and within the drainage lines should be mitigated to reduce the rate and volume of run-off and prevent erosion.*
  - *Any of the cleared areas that are not hardened surfaces should be rehabilitated after construction is completed by re-vegetating the areas disturbed by the construction activities with suitable indigenous plants.*

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

- *Water quality impact*
  - *Contaminated runoff from construction should be prevented from entering the river. All materials on the construction site should be properly stored and contained. Disposal of waste from the site should also be properly managed. Construction workers should be given ablution facilities at the construction site that are located outside of the recommended buffer for the river and regularly serviced.*

- *Contaminated runoff from construction should be prevented from entering the river. All materials on the construction site should be properly stored and contained. Disposal of waste from the site should also be properly managed. Construction workers should be given ablution facilities at the construction site that are located outside of the recommended buffer for the river and regularly serviced. These measures should be addressed, implemented and monitored in terms of the Environmental Management Plan for the construction phase.*
- *Maintenance of infrastructure related to the project should only take place via the designated access routes. Disturbed areas along the access routes should be monitored to ensure that these areas do not become subject to erosion or invasive alien plant growth.*

Impact Assessment :

Impact Description	Significance Without Mitigation	Extent	Duration	Probability	Magnitude / Intensity	Significance After Mitigation
Aquatic & Riparian Vegetation Impact	Low	Local	Short term	Possible	Low	Very low

Terrestrial Fauna and Flora Impact

Impact Description :

o *Loss of natural vegetation*

The construction of pylons could lead to the destruction and loss of vegetation. Vegetation loss 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. These activities have an impact on fauna breeding, foraging and roosting in or in close proximity of the servitude, both through modification of habitat and disturbance caused by human activity. Thus it is important that no unnecessary destruction of the habitat takes place during any development/construction phase.

The expansion of the current substation to the east will lead to the destruction of a section of the rocky hill area that will be permanent. If proper mitigation measures are implemented the effect can however be somewhat mitigated to lessen the impact.

o *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. The implications of habitat fragmentation is that edge effects along the fragments can cause a further reduction in the habitat while plants and sessile organisms are not able to reproduce

anymore that will eventually lead to them dying out. Thus these isolated habitats will become unsuitable to many of the original species occurring in the area. Species populations can only remain viable if large enough habitat remains or if sizeable corridors exist between the fragments.

- *Impacts on vulnerable species*

  For the purpose of this report the term "vulnerable species" to threatened, protected, medicinal and red data species. Natural populations of species not regarded as "vulnerable" usually occur in large numbers within various suitable habitats. Vulnerable species are normally species whose habitats have become smaller, usually as a result of human actions, but also as a result of natural disasters (e.g. floods, droughts, fire etc.). The result is that these species are already under stress and any further reduction in their habitat could cause their extinction. Not only will the loss of such a 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. It is therefore recommended that buffer zones varying from 5m to a 1000m are placed around such species/ecosystems to protect their integrity and survival.

- *Establishment of invasive 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. These species have superior reproduction and/or vegetative growth mechanisms that enable them to grow and increase faster than other species in the same habitat. Under normal conditions in a stable ecosystem they will not become dominant. However, if a disturbance in the environment takes place whether human induced or natural, these species will normally invade these disturbed areas, displace the few natural species remaining and form a homogeneous stand of vegetation. This could then lead to an uncontrollable spread of these species into the ecosystem as well as adjacent systems. The consequences of alien plant invasions is a loss of soil water, change in nutrient status of the soil, loss of indigenous and climax vegetation, species diversity, change in plant community composition and structure and eventually loss in ecosystem functioning as well as adjacent ecosystems.

  Mitigation :

  - *The Plant Rescue & Protection Management Plan as compiled during the Design Phase must be implemented before construction commences.*
  - *Close site supervision must be maintained during construction*
  - *The current roads present in the area must be used as far as possible to move equipment and building material. This is especially important on the rocky ridge areas.*
  - *During the construction phase 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.*
- *Educational programmes for the contractor's staff must be implemented to ensure that project workers are alerted to the possibility of snakes being found during vegetation clearance. The construction team must be briefed about the management of snakes in such instances. In particular, construction workers are to go through ongoing refresher courses to ensure that threatened snakes, such as Southern African Python, are not killed or persecuted when found.*
- *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.*
- *All vegetation not interfering with the operation of the line shall be left undisturbed this is especially pertinent to the protected species.*
- *In areas where degradation has taken place as a result of the construction, a suitably qualified ecologist or 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.*
- *No pylons should be placed within the riverine vegetation and their associated floodplains.*
- *Control of alien vegetation:-*
    - *Alien vegetation in servitudes shall be managed in terms of the Regulation GNR.1048 of 25 May 1984 (as amended) issued in terms of the Conservation of Agricultural Resources Act, Act 43 of 1983. In terms of these regulations, Eskom shall "control" i.e. to combat Category 1, 2 and 3 plants to the extent necessary to prevent or to contain the occurrence, establishment, growth, multiplication, propagation, regeneration and spreading such plants within servitude areas or land owned by Eskom.*
    - *The use of herbicides shall be in compliance with the terms and conditions of The Fertilisers, Farm Feeds, Agricultural Remedies and Stock Remedies Act, 1947 (Act 36 of 1947).*
    - *All alien vegetation should be eradicated along the servitude. Invasive species 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.*

Impact Assessment :

Impact Description	Significance Without Mitigation	Extent	Duration	Probability	Magnitude / Intensity	Significance After Mitigation
Substation extension	Moderate-high	Site	Permanent	Definite	Moderate	Moderate
Powerline construction	Moderate - Low	Site	Long term	Definite	Moderate to Low	Low

Avi-Fauna Impact

Impact Description :

- *Displacement of priority species could occur due to habitat destruction and disturbance associated with the construction of the substation and power lines.*
- *Cumulative Impact: Although each substation and power line development probably affects a relatively small proportion of the landscape, there are already several existing activities and infrastructure in this area that has resulted in significant habitat transformation, and additional infrastructure in the form of power lines and substations will add further cumulative impact. It is important therefore to try to limit the effects of the new substation and power line as much as possible, by applying the proposed mitigation measures.*

Mitigation :

- *Construction activity should be restricted to the immediate footprint of the infrastructure. Access to the remainder of the site should be strictly controlled to prevent unnecessary disturbance of priority species.*
- *Measures to control noise should be applied according to current best practice in the industry.*
- *Maximum use should be made of existing access roads and the construction of new roads should be kept to a minimum.*
- *The recommendations of the ecological and botanical specialist studies must be strictly implemented, especially as far as limitation of the construction footprint and rehabilitation of disturbed areas is concerned.*

Impact Assessment :

Impact Description	Significance Without Mitigation	Extent	Duration	Probability	Magnitude / Intensity	Significance After Mitigation
Displacement of priority species due to habitat disturbance and destruction	Low	Site	Short term	Possible	Moderate	Very low

Visual Impact

Impact Description :

- *During the Construction Phase the proposed Project will exert a moderate negative impact (i.e. the impact is real but not substantial) on the visual and aesthetic environment. Noise pollution could be a nuisance due to loos consistency of the soils that occur together with strong winds during certain times of the year.*

Mitigation :

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

Impact Assessment :

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

Influx of labourers to the area

Impact Description :
An influx of workers could result in an increased risk for crime and safety and disturbance to and destruction of natural habitat.

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.*
- *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 Assessment :

Impact Description	Significance Without Mitigation	Extent	Duration	Probability	Magnitude / Intensity	Significance After Mitigation
Influx of workers to the area	Low	Local	Short	Possible	Low	Very Low

Impacts associated with construction activities such as noise and dust

Impact Description :

- *Dust created by construction vehicles could impact on air quality during the construction period. In addition, the loose consistency of the soils together with the strong winds during certain times of the year could result in a negative impact on the Eskom infrastructure and buildings.*
- *Labourers and machinery could result in noise pollution during the construction period.*

Mitigation :

- *It is proposed to plan a trees screen along the eastern boundary of the substation site to act as both a visual and wind barrier.*
- *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.*
- *At the construction camp noise made by the workers (i.e. radios) must be limited to early evenings.*
- *Construction vehicles must be services 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.

Impact Assessment :

Impact Description	Significance Without Mitigation	Extent	Duration	Probability	Magnitude / Intensity	Significance After Mitigation
Dust	Moderate to low	Site	Short term (construction activities)	Probable	Moderate	Low
Noise	Low	Site	Short terms	Possible	Low	Very low

OPERATION AND MAINTENANCE PHASE

Aquatic and Riparian Impact

Impact Description :
Impact is associated with disturbance of habitat and possibly impedance/diversion of flow at river crossings during maintenance procedures.

Mitigation :

- *Maintenance of infrastructure related to the project should only take place via the designated access routes. Disturbed areas along the access routes should be monitored to ensure that these areas do not become subject to erosion or invasive alien plant growth.*
- *Maintenance personnel must be provided with proper ablution and cooking facilities at all times.*

Impact Assessment :

Impact Description	Significance Without Mitigation	Extent	Duration	Probability	Magnitude / Intensity	Significance After Mitigation
Aquatic and Riparian Impact	Low	Local	Short term	Low	Low	Very low

Avi-Fauna Impact

Impact Description :

- *Electrocution of priority species*
  With regards to the infrastructure within the substation yard, the hardware is too complex to warrant any mitigation for electrocution at this stage. It is rather recommended that if on-going impacts are recorded once operational, site specific mitigation be applied reactively. This is an acceptable approach because priority bird species are unlikely to frequent the substation and be electrocuted.

Cumulative impact : Any electrical infrastructure in the form of substations and switching stations will undoubtedly increase the cumulative electrocution risk to small priority species that are attracted to these structures and installations as a result of the roosting and nesting opportunities that they provide, but the overall cumulative impact of current infrastructure on priority species is rated as low. Reactive mitigation as discussed above will further reduce this impact.

- *Priority species mortality due to collision*
  Cumulative Impact: The cumulative impacts of power lines on birds through collision are significant nationally. However, if properly mitigated, the cumulative impact of the proposed line could be reduced to low. The broader study area already has several existing power lines. No effort should be spared to ensure that the new power line is built bird friendly and results in the least possible additional impact on birds in the area.

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

Impact Assessment :

Impact Description	Significance Without Mitigation	Extent	Duration	Probability	Magnitude / Intensity	Significance After Mitigation
Electrocution of priority species	Low	Site	Long term	Possible	Low	Very low
Priority species mortality due to collision	High	Regional	Long term	Definite	Moderate	Low

Impact on the natural habitat

Impact Description :
Impact on the natural habitat during the operational phase is mostly related to erosion could occur where vegetation did not establish itself effectively; establishment of alien vegetation and uncontrolled maintenance labourers (addressed under another heading below).

Mitigation :

- *The project area and disturbed areas along the access routes must be monitored to confirm that vegetation has re-established effectively and monitor the site for any signs of erosion or invasive alien plant growth .*
- *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.*
- *Maintenance of infrastructure related to the project should only take place via the designated access routes.*

- *Control of alien vegetation:-*
  - *Alien vegetation in servitudes shall be managed in terms of the Regulation GNR.1048 of 25 May 1984 (as amended) issued in terms of the Conservation of Agricultural Resources Act, Act 43 of 1983. In terms of these regulations, Eskom shall "control" i.e. to combat Category 1, 2 and 3 plants to the extent necessary to prevent or to contain the occurrence, establishment, growth, multiplication, propagation, regeneration and spreading such plants within servitude areas or land owned by Eskom.*
  - *The use of herbicides shall be in compliance with the terms and conditions of The Fertilisers, Farm Feeds, Agricultural Remedies and Stock Remedies Act, 1947 (Act 36 of 1947).*
  - *All alien vegetation should be eradicated along the servitude. Invasive species should be given the highest priority.*

Impact Assessment :

Impact Description	Significance Without Mitigation	Extent	Duration	Probability	Magnitude / Intensity	Significance After Mitigation
Erosion	Moderate	Site	Long term	Possible	Moderate	Low
Alien vegetation	Moderate	Site	Long term	Possible	Moderate	Low

Visual Impact

Impact Description :
The Operational Phase is predicted to exert a moderate impact without mitigation. Mitigation is possible, in the form of a tree screen to the east of the substation, during the operational phase but it will not substantially reduce the cumulative impact of the power lines. It will however screen sensitive views from the east to the sub-station. It also must be noted that the tree screen will not be effective immediately it will have to establish over a number of years before it will effectively contribute to mitigating the visual impact.

Visual issues have not been raised as a major concern by the local community and therefore the sensitivity to the project from this perspective is low. The study area already contains a substation and power lines and the proposed new development would be constructed adjacent to these structures. The main visual impact of the project is of a cumulative nature and is assessed as such. Cumulative impact occurs as a result of the existing 66kV powerline crossing the Orange River along which the two new lines are being planned to run parallel; as well as the existing Oranjemond Substation that will be extended.

Mitigation :
Mitigation is very difficult during the operational phase. It is proposed that any mitigation be implemented already during the design and construction phases. The results will show during the operational phase.

Impact Assessment :

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

Impact resulting from Eskom inspections and maintenance

Impact Description :

This impact is associated with Eskom maintenance personnel and/or outside contractors appointed to inspect the Eskom structures. Impact that could potentially occur is destruction of habitat (i.e. cutting of trees for firewood); illegal placement of snares, increased crime and safety risk to adjacent landowners, etc.

Mitigation :

- *Maintenance workers must be extremely careful not to damage any property along the proposed route. Should any damage occur it should be reported to Eskom for immediate action and rectification. .*
- *Removal of agricultural products is prohibited.*
- *No firewood may be collected.*
- *No open fires are to be made on private property.*
- *No wandering or entering on adjacent properties is allowed.*
- *All maintenance 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 maintenance contractors must at all times take place.*
- *Maintenance of infrastructure related to the project should only take place via the designated access routes. Disturbed areas along the access routes should be monitored to ensure that these areas do not become subject to erosion or invasive alien plant growth.*

Impact Assessment :

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

6.3.2 ENVIRONMENTAL MANAGEMENT PLAN

The main objectives of the EMP are to identify 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 must also be provided.

According to the NEMA 2014 Regulations, Appendix 4, an EMPr must comply with section 24N of the Act and include :-

(a) details of (i) the EAP who prepared the EMPr; and (ii) the expertise of that EAP to prepare an EMPr, including a curriculum vitae;

(b) a detailed description of the aspects of the activity that are covered by the EMPr as identified by the project description;

(c) a map at an appropriate scale which superimposes the proposed activity, its associated structures, and infrastructure on the environmental sensitivities of the preferred site, indicating any areas that any areas that should be avoided, including buffers;

(d) a description of the impact management objectives, including management statements, identifying the impacts and risks that need to be avoided, managed and mitigated as identified through the environmental impact assessment process for all phases of the development including-

(i) planning and design;
(ii) pre-construction activities;
(iii) construction activities;
(iv) rehabilitation of the environment after construction and where applicable post closure; and (v) where relevant, operation activities;

(e) a description and identification of impact management outcomes required for the aspects contemplated in paragraph (d);

(f) a description of proposed impact management actions, identifying the manner in which the impact management objectives and outcomes contemplated in paragraphs (d) and (e) will be achieved, and must, where applicable, include actions to

(i) avoid, modify, remedy, control or stop any action, activity or process which causes pollution or environmental degradation;
(ii) comply with any prescribed environmental management standards or practices;
(iii) comply with any applicable provisions of the Act regarding closure, where applicable; and
(iv) comply with any provisions of the Act regarding financial provisions for rehabilitation, where applicable;

(g) the method of monitoring the implementation of the impact management actions contemplated in paragraph (f);

(h) the frequency of monitoring the implementation of the impact management actions contemplated in paragraph (f);

(i) an indication of the persons who will be responsible for the implementation of the impact management actions;

(j) the time periods within which the impact management actions contemplated in paragraph (f) must be implemented;

(k) the mechanism for monitoring compliance with the impact management actions contemplated in paragraph (f);
(l) a program for reporting on compliance, taking into account the requirements as prescribed by the regulations;
(m) an environmental awareness plan describing the manner in which-
    (i) the applicant intends to inform his or her employees of any environmental risk which may result from their work; and
    (ii) risks must be dealt with in order to avoid pollution or the degradation of the environment; and
(n) any specific information that may be required by the competent authority.

Identified impacts and mitigation will be monitored through the application of the Environmental Management Plan (EMP) that is included as Appendix E of the EIR.

6.4 CONCLUSION OF IMPACT ASSESSMENT

- As can be seen from the summary tables below, all identified impacts can be mitigated to acceptable levels.
- The impacts assessed include issues raised by the different specialists as well as other impacts as identified by the EAP.
- All natural, social and cultural functions and processes will be able to continue *after* mitigation measures have been applied.
- No substantial impact *after* mitigation has been applied is expected to occur.
- The impact of this project can, in general, be seen as minimal.
- All the mitigation measures are included in the Environmental Management Plan, which means that Eskom is legally bound to follow the recommendations.

Summary of Impact Assessment Tables

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

Impact Description	Significance Without Mitigation	Extent	Duration	Probability	Magnitude / Intensity	Significance After Mitigation
Aquatic & Riparian Vegetation Poor planning ito the Orange River and drainage lines	Moderate	Local	Temporary	Possible	Moderate	Low

Terrestrial Flora Impact on flora resulting from poor planning	Moderate to low	Local	Short-Medium term	Possible	Low	Low
Cultural Heritage Impact on stone tools	Low	Site	Permanent	Possible	Low	Very low
Visual impact Impact on visual resources	Moderate	Site and Local	Permanent	High	Low	Moderate-Low
Landownership and Land Claim Land claim issue	Low	Local	Permanent	Probable	Moderate	Very low

Construction Phase

Impact Description	Significance Without Mitigation	Extent	Duration	Probability	Magnitude / Intensity	Significance After Mitigation
Increased risk for groundwater pollution Groundwater pollution	Moderate	Local	Medium – long term	Possible	Moderate	Low
Increased risk for erosion Erosion	Moderate	Local	Medium	Possible	Moderate	Low
Aquatic & Riparian Vegetation Impact	Low	Local	Short term	Possible	Low	Very low
Terrestrial Fauna & Flora Substation extension	Moderate-high	Site	Permanent	Definite	Moderate	Moderate
Terrestrial Fauna & Flora Powerline construction	Moderate - Low	Site	Long term	Definite	Moderate to Low	Low
Avifauna Displacement of priority species due to habitat disturbance and destruction	Low	Site	Short term	Possible	Moderate	Very low

Visual Impact Impact on visual resources	Moderate	Local	Short term	Definite	Moderate	Moderate
Influx of workers to the area	Low	Local	Short	Possible	Low	Very Low
Dust	Moderate to low	Site	Short term (construction activities)	Probable	Moderate	Low
Noise	Low	Site	Short terms	Possible	Low	Very low

Operation and Maintenance Phase

Impact Description	Significance Without Mitigation	Extent	Duration	Probability	Magnitude / Intensity	Significance After Mitigation
Aquatic and Riparian Impact	Low	Local	Short term	Low	Low	Very low
Avifauna Electrocution of priority species	Low	Site	Long term	Possible	Low	Very low
Avifauna Priority species mortality due to collision	High	Regional	Long term	Definite	Moderate	Low
Impact on natural habitat Erosion	Moderate	Site	Long term	Possible	Moderate	Low
Impact on natural habitat Alien vegetation	Moderate	Site	Long term	Possible	Moderate	Low
Visual Impact Impact on visual resources	Moderate	Local	Permanent	Probable	Moderate	Moderate
Impact resulting from Eskom inspections and maintenance Inspection and maintenance	Low	Local	Short	Possible	Low	Very Low

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.

The Draft Environmental Scoping Report had been submitted to the Legal Review Specialist for the project, Moketla Mamabolo Attorneys. The assessment letter for the Scoping Report was included as Appendix C(9) in the Final Scoping Report to DEA.

Main findings and recommendations from the legal review of the Scoping Report

Listed Activities

- It was confirmed that the listed activities described in the Draft Scoping Report are indeed triggered by the activities involved.
- Activity Nr 47 of Listing Notice 1 of GNR 983 *"The expansion of facilities or infrastructure for the transmission and distribution of electricity where the expanded capacity will exceed 275kilovolts and the development footprint will increase"* also requires authorisation.

Response :
An amended "Application for Environmental Authorisation" was prepared to include this activity.

Content of the Scoping Report (as per Regulation 21, 22 and 23 of the EIA Regulations)

- It was confirmed that the information contained in the scoping report and the consultation process undertaken, sufficiently comply with the requirement of the said objective of the scoping process.
- It was confirmed that the information contained in the scoping report and the environmental specialist reports, sufficiently comply with the requirement of the content of a scoping report.
- All relevant details of the specialists are not supplied in the Scoping Report. The EAP must

ensure that the expertise; Curriculum vitae and Declaration of Independence of all the specialists are included in the Final Scoping Report.

Response : All the required information of the specialists are now included in Appendix E(2).

Public Participation Process

- It was confirmed that the public participation process was wide enough (more than what the Regulations prescribed) and that all Interested & Affected Parties whom could potentially be affected by the proposed development were notified and consulted on the project.
- Confirmation is required to confirm that the registered owner of the land, Pico Eco Farm Close Corporation does give consent for the proposed Eskom development.
- It was acknowledged that a claim against the property was confirmed by the Regional Land Claims Commission as being valid. It must be noted that once a notice of the claim in respect of any land had been published in the Gazette, specific restrictions apply that includes that no person may sell, exchange, donate, lease, subdivide, rezone or develop the land in question without having given the regional land claims commissioner one months' written notice of his or her intention to do so. The Regional Land Claims Commissioner has 30 days in which to approach the court for an interdict.
- It was recommended that the status of the claim (whether the notice had been gazetted or not) needs to be confirmed.
- It should be noted, from a legal point of view, that nothing is contained in the Act to preclude the Environmental Impact Assessment process to run its course, however, the notification step to the Regional Land Claims Commissioner is of fundamental importance that it be issued as required by the Act.

Response :

- *Appendix D(7) includes confirmation of communication with the representative of the registered landowner regarding this project. No objection was raised.*
- *The Richtersveld Sida Hub Communal Property Association (CPA) has a land claim against the two properties (Re and Portion 4 of the Farm Grootderm 10, Namaqualand RD, gazetted on 29 August 2008 (Notice 1049 of 2008).*
- *The requirement in terms of notification by Eskom to the Regional Land Claims Commissioner of the intent to develop the property, has been included in the Environmental Management Plan that will form part of the Environmental Impact Report.*
- *Both the Department of Rural Development & Land Reform, Office of the Regional Land Claims Commissioner, Northern Cape, Chief Director, Ms Mangalane du Toit (as well as numerous other DRDL government officials) and the attorneys representing the CPA (Mr Duncan Korabie) are included on the List of Interested & Affected Parties and their offices are continuously being kept informed of the EIA process.*

Compliance with other applicable parallel legislations

- It was agreed that Water Use Authorisation is required in terms of the National Water Act, 1998 (Act No 36 of 1998). The relevant activities are 21(c) "*Impeding or diverting the flow in a water course'* and 21(i) *'Altering the bed, banks, course or characteristics of a watercourse'.*
- It was advised that the Water Use License Application be initiated as soon as possible to prevent derailing of the physical implementation of the project as a result of the time it could take to obtain water use authorisation.

Other legal matters

- It was advised that rezoning of the property might become necessary to accommodate the extension of the Oranjemond MTS. The property bears the description of 'farm land'' and it is probably zoned ''Agriculture" in terms of the Town Planning/Land Use Management Scheme of the Richtersveld Local Municipality. The existing zoning must be altered to accommodate the proposed activity.

Response :
The requirement to ensure that the land use rights are in place will be included in the Environmental Management Plan that will form part of the Environmental Impact Report.

Conclusion of the Legal Review of the Scoping Phase

It was concluded that the requirement as laid down in NEMA and its Regulations had sufficiently been addressed, with the attention to the specific concerns/issues raised above.
Moketla Mamabolo Attorneys did not foresee that there would be any legal impediment for the project to proceed.

Main findings and recommendations from the legal review of the Draft EIR

The Draft Environmental Impact Report was submitted to Moketla Mamabolo Attorneys, the Legal Review Specialist for the project. The assessment letter for the EIR is included as Appendix C(10) in the Final Environmental Impact Report to DEA. The main findings of the legal review on the Draft EIR is summarised below.

- The attorneys are satisfied that, from a legal point of view, the Report (with all its Annexures) sufficiently complied with the requirements of the 2014 Regulations and NEMA.
- They do not foresee that there would be any impediment from a merit and legal point of view that would militate the granting of an environmental authorisation.

7.2 ENVIRONMENTAL IMPACT STATEMENT

The following key issues should be considered to allow for informed and responsible decision-making :

Soils

Thin transported windblown soils (Aeolian) occur away from the Orange River from surface comprising mainly yellowish brownish silty sands. They are largely absent around the substation site but the depths of these soils appear significantly across the steeper terrain and on the wind leeward side near the river. These soils may be considered to be loose in nature and unconsolidated. The area is known for its strong winds. The average wind speed for the area is 15 km/h with the strongest winds experienced from October to February. Wind speeds of more than 70 km/h have been experienced in the area. Mitigation to protect the Eskom infrastructure should be implemented, i.e. plant of trees as windscreens (also to partially screen the substation from the road – see Visual Impact below).

Ground and surface water

- Recharge of groundwater is limited, occurring in small quantities being restricted by the limited rainfall and generally hard geological formations. Aquifer characteristics would thus typically be expected to be unfavourable.
- There is also little potential for surface water to pond on the site providing little capacity for any ground water recharge from surface there.

Aquatic and riparian environment

- The Orange River is in a largely modified ecological state with a high ecological importance and sensitivity.
- There should be no further deterioration in river condition for this section of river.
- Potential impact (mostly during construction)
    - Direct modification or loss of aquatic habitat
    - Potential flow impact
    - Water quality impact
- The pylons must be constructed within the recommend buffer but not within the mapped riparian zone, as per Appendices A4(a) and C(2)(b).
- Water Use Authorisation in terms of the National Water Act (Nr 36 of 1998) is required for the crossing of the river. The relevant listed activities are :
    - Section 21 (c) Impeding or diverting the flow in a watercourse
    - Section 21 (i) Altering the bed, banks, course or characteristics of a watercourse

  The Risk Assessment Matrix provided by the Department of Water and Sanitation was used in the assessment of the risk posed to the aquatic ecosystems by the proposed project. The proposed activities pose a **low** risk to the aquatic ecosystems for both the Construction and Operational & Maintenance Phases of the project.

The regulation relating to General Authorisations for Section 21 (c) and (i) water uses has been revised so that General Authorisation in terms of the Water Act could therefore be relevant to this project because of the low risk rating.

Fauna and Flora

- The study area on the northern side of the Orange River is classified as an Ecological Support Area (ESA) and the section of the study area on the South African side of the Orange River is classified as a Critical Biodiversity Area (CBA) Type 2.
- There are three vegetation types present in the study area:
    - Western Gariep Lowland Desert (Dn4);
    - Lower Gariep Alluvial Vegetation (Aza3)
    - Arid Estuarine Salt Marshes (AZe1).
- Two vegetation units were described :-
    - The desert area
        - (a) Lowland section
        - (b) Rocky Section
    - Riverbank area
- Impact associated with powerlines :-
    - Loss of natural vegetation
    - Habitat fragmentation (loss of landscape connectivity)
    - Impacts on vulnerable species
    - Establishment of invasive plants and declared weeds
    - Destruction of rocky vegetation where the new substation will be constructed
- The results of the impact evaluations done by the ecologist for both vegetation units show that the proposed power lines should have **no severe (high) impact** on the different units with **medium-low** impacts over the **short-long term** that will be experienced in the different vegetation units.
- The expansion of the current substation to the east will lead to the destruction of a section of the rocky hill area (part of the rocky section) that will be permanent. If proper mitigation measures are implemented the effect can however be somewhat mitigated to lessen the impact.
- A site walkdown with the ecologist is required once the pylon positions have been determined.
- A Plant Rescue & Protection Management Plan must be compiled to confirm the permitting requirements of the Northern Cape Department of Environment and Nature Conservation to ensure compliance with the Northern Cape Provincial Act (Act 9 of 2009).

Bird Impact

- The site is located 10km upstream from the Important Bird Area (IBA) - referred to as the Orange River Mouth Transboundary Ramsar Site.
- Three main impacts of powerlines on birdlife are the following :
    - Electrocutions
    - Collisions
    - Displacement due to habitat destruction and disturbance

- Bird flight diverters are proposed on the earth wires and there should be OWL devices (LED lights) for Flamingo's. These devices are fitted with little solar panels with lights that flicker at night.
- With mitigation :
    - Impact resulting from displacement and electrocution will be **low to very low**
    - Impact resulting from electrocution will be **low**.

Paleontological Impact

- The area does not provide good conditions for the preservation of fossils. **No impact** is expected.

Heritage Impact

- No sites of cultural heritage significance were located in the surveyed area.
- Many stone tools have however been noted and the way forward will be determined during site walk-down.
- The South African Heritage Resources Authority has already approved the Heritage Impact Report with its conditions, for this project (included in Appendix D(9).

Agricultural Aspects

- As the area has little precipitation with sparse natural vegetation very difficult conditions are presented for being able to carry out agricultural activities in an economical manner within the sites limited area.
- The project development site provides very limited and remote potential for pastoral activities. The flood plain is restricted along the proposed powerline route and little potential exists should the area be developed with irrigating from water supplied from the Orange River.
- **No impact** is expected.

Visual Impact

- Visual issues have not been raised as a major concern by the local community and therefore the sensitivity to the project from this perspective is low.
- The study area already contains a substation and power lines and the proposed new development would be constructed adjacent to these structures. Therefore the main impact of the project is of a cumulative nature and is assessed as such.
- During the Construction Phase the proposed Project will exert a **moderate impact** (i.e. the impact is real but not substantial) on the visual and aesthetic environment. Mitigation during this phase is possible but it revolves mainly around 'good housekeeping i.e. suppression of dust at the substation site and along access roads during the construction of the towers.
- The Operational Phase is predicted to exert a **moderate impact** without mitigation. Mitigation is possible, in the form of a tree screen to the east of the substation, during the operational phase but it will not substantially reduce the cumulative impact of the power lines. It will however screen sensitive views from the east to the sub-station. It also must be noted that the tree screen will not be effective immediately it will have to be established over a number of years before it will effectively contribute to mitigating the visual impact.
- The visual impact specialist concluded that the proposed activity should be authorised with

the proviso that the proposed management measures are binding to this authorization.

Community

- No objection had been received during the comprehensive Public Participation Programme undertaken for this project.
- The impact on tourism and landuse is not expected to be significant.
- The Richtersveld Sida Hub Communal Property Association (CPA) has a land claim against the property, gazetted on 29 August 2008 (Notice 1049 of 2008). They require continuous liaison with them. They require continuous liaison with them. It was confirmed that from a legal point of view, nothing is contained in the relevant Act to preclude the Environmental Impact Assessment process to run its course however the notification step to the Regional Land Claims Commissioner is of fundamental importance – this is the responsibility of Eskom being the Applicant.

Conclusive Impact Statement

It is the informed and carefully considered opinion of the EAP that all expected negative impact associated with this proposed project can be mitigated to acceptable levels with the implementation of the Environmental Management Plan included as Appendix F of the Environmental Impact Report.

7.3 RECOMMENDATIONS BY EAP

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

- All reasonable actions had been taken to identify any relevant environmental components in the study area.
- The relevant specialist input obtained up to date is comprehensive and effective in providing an assessment of each relevant environmental component together with expected impact and proposed mitigation. The EAP is of the opinion that no information not contained in these reports could change the outcome of the recommendations for the project.
- All the specialists concluded that the project could continue with the implementation of mitigatory measures as proposed.
- Significant and reasonable actions were taken to identify and notify all Interested & Affected Parties that include government departments, relevant authorities, general stakeholders and affected landowners of the project.
- The Environmental Impact Report includes all proceedings, findings and recommendations from the EIR Phase.
- All relevant legal requirement in terms of the Environmental Impact Report as per the Environmental Impact Assessment Regulations published on 4 December 2014 as per the National Environmental Management Act, 1998 (Act No 107 of 1998) as amended had been complied with.

The Environmental Assessment Practitioner recommends without hesitation the proposed Eskom project, the "Kudu Power Station (PS) – Oranjemond 1st & 2nd 400kV Lines'' for Environmental Authorisation by the Department of Environmental Affairs (DEA). The ***final project components*** are the following:

- The existing Oranjemond MTS Substation would be upgraded and expanded to accommodate the new power lines as follows:
    - Constructing a 400kV yard and equipment including busbar;
    - Installing a 1x 315MVA 400/220kV transformer
    - Create at least 4x 400kV line bays to allow for potential development.
- 2x 400kV power lines would be constructed from the Namibian side of the Orange River across the river to connect to the Oranjemond MTS Substation
- A new access road to the existing Oranjemond Substation site
- The R382 road deviation at the south-east corner of the substation extension
- A two-track service road between the two new powerlines within the servitude. The final project components include :

The proposed preferred project alternatives for the project within the investigated corridor are the most viable from both a technical and environmental viewpoint whilst meeting the objectives of the mandate of Eskom SOC Limited as the South African utility to generate, transmit and distribute electricity in compliance with national requirement and relevant policies.

It is recommended that the following specific conditions form part of the Environmental Authorisation :-

- The implementation of the Environmental Management Plan provided in Appendix E of the Final EIR must be implemented.
- A site walk-down with the Ecologist and the Heritage Consultant should take place with the Eskom project team once the specific pylon conditions had been determined. A site walk-down report should be compiled and submitted to DEA for record purposes. All reasonable recommendations by the specialists resulting from the site walk-down must be implemented.
- A Plant Rescue & Protection Management Plan must be compiled and implemented.
- An application must be made according to the permitting requirements of the Northern Cape Department of Environment and Nature Conservation to ensure compliance with the **Northern Cape Provincial Act (Act 9 of 2009)**.
- An application for Water Use Authorisation must be made with the Department of Water and Sanitation to ensure compliance with the **National Water Act (Nr 36 of 1998**).
- It is requested to approve a corridor width of 1km in which a 90m servitude for the purpose of this project will be registered. The servitude width of a 400kV line is 55m for each line – where parallel to each other it will be separated by 35m, with 27,5m on the outside - the total width of the powerline servitude required for this project for the two lines together is therefore 90m. This will enable reasonable adjustments within the corridor during the walk-down and servitude negotiations with the relevant landowner without having to enter into an additional environmental authorisation process.

8.3 AFFIRMATIONS BY THE EAP

AFFIRMATION

We, Annelize Grobler & Susanna Nel, herewith confirm the following :-

- The information contained in this report is to the best of our knowledge and experience correct
- All relevant comment and input provided by the stakeholders and I&APs are included and addressed in this EIR.
- Input and recommendations from the specialist reports are provided in and integrated with the EIR.
- All information made available by the EAP to I&APs and any responses thereto as well as comment and input from I&APs are provided in the EIR

Annelize Grobler
DATE: 28 March 2017

Susanna Nel
DATE: 28 March 2017

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