



OYA ENERGY (PTY) LTD

**Proposed Development of the 132kV Oya
Power Line near Matjiesfontein, Western
and Northern Cape Provinces**


Draft Basic Assessment Report (DBAR)

DEFF Reference Number: To be Allocated

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KEY PROJECT INFORMATION

FARM DESCRIPTION	21-DIGIT SURVEYOR GENERAL (SG) CODE
KUDUSBERG TO OYA POWER LINE CORRIDOR ROUTE	
Remainder of the Farm Matjes Fontein No 194	C072000000001940000
Portion 1 of the Farm Amandelboom No 158	C019000000001580001
Remainder of the Farm Oliviers Berg No 159	C019000000001590000
Remainder of the Farm Gats Rivier No 156	C019000000001560000
Portion 1 of the Farm Gats Rivier No 156	C019000000001560001
Remainder of the Farm Baakens Rivier No 155	C019000000001550000
POWER LINE CORRIDOR ROUTE ALTERNATIVE 4 (OYA TO KAPPA)	
Remainder of the Farm Baakens Rivier No 155	C019000000001550000
Portion 4 of the Farm Bantamsfontein No 168	C019000000001680004
Portion 13 of the Farm Bantamsfontein No 168	C019000000001680013
Remainder of the Farm Lower Roodewal No 169	C019000000001690000
Remainder of the Farm Rietpoort No 243	C019000000002430000
The Farm Die Brak No 241	C019000000002410000
The Farm Platfontein No 240	C019000000002400000

Power line corridor route alternatives for the section of the proposed power line which connects the Oya substation to the Kappa substation (i.e. **Oya to Kappa**) have been identified and comparatively assessed by the respective specialists. These alternatives provide different route alignments contained within an assessment corridor (refer to **section 8**). **Power Line Corridor Alternative 4 (Oya to Kappa)** has been selected as the 'preferred' power line corridor route alternative. Only one (1) route is possible for the section of the proposed power line which connects the Kudusberg substation to the Oya substation (**Kudusberg to Oya**). It should be noted that only the farms / properties which will be traversed and/or affected by the **Kudusberg to Oya** and **Oya to Kappa** (i.e. **Power Line Corridor Alternative 4**) power line corridor routes have been provided in the table above. All power line corridor routes (including alternatives) were however extensively investigated and all alternatives comparatively assessed (refer to **section 8**). It should be noted that the Oya Substation will be located on Remainder of the Farm Baakens Rivier No. 155, while the Kudusberg Substation will be located on Remainder of the Farm Matjes Fontein No 194.

OYA GRID: KUDUSBERG TO OYA POWER LINE CORRIDOR ROUTE				
CENTRE LINE COORDINATES (DD MM SS.sss)				
CORRIDOR	START POINT (KUDUSBERG SUB)	MIDDLE POINT	END POINT (OYA SUB)	APPROX LENGTH (KM)
Kudusberg to Oya	S32° 52' 6.431"	S32° 52' 22.996"	S32° 54' 24.448"	16.6
	E20° 21' 51.032"	E20° 17' 13.070"	E20° 12' 28.565"	
OYA GRID: PREFERRED POWER LINE CORRIDOR ROUTE ALTERNATIVE (OYA TO KAPPA)				
CENTRE LINE COORDINATES (DD MM SS.sss)				
CORRIDOR ALTERNATIVE	START POINT (OYA SUB)	MIDDLE POINT	END POINT (KAPPA SUB)	APPROX LENGTH (KM)
Alternative 4 (Oya to Kappa)	S32° 54' 24.448"	S33° 0' 51.986"	S33° 6' 29.185"	32.94
	E20° 12' 28.565"	E20° 6' 19.061"	E20° 0' 40.626"	

For the purpose of this Basic Assessment (BA), corridors of up to approximately 300m wide (i.e. 150m on either side of power line) were assessed for the proposed power line corridor routes (including alternatives for Oya to Kappa route). This is to allow for flexibility to route the power line within the authorised corridors. The proposed 132kV power line will

however only require a 31m wide servitude and as such, this servitude (and proposed power line) would be positioned within the assessed corridors.

OYA GRID: SUBSTATION SITE COORDINATES			
SUBSTATION	AREA (HECTARES)	CENTRE POINT COORDINATES	
		SOUTH	EAST
33/132kV Oya Substation ¹	4	S32° 54' 24.448"	E20° 12' 28.565"
33/132kV Kudusberg Substation ²	4	S32° 52' 9.50"	E20° 21' 47.01"

Refer to **Appendix 9A** for the full list of coordinates, including all the bending points of the proposed power line corridors (including alternatives), from the starting point to the finishing point.

¹ Substation includes Eskom portion and Independent Power Producer (IPP) portion. Substation also forms part of Oya Energy Facility (separate on-going EIA process with **DEFF Ref No.:** 14/12/16/3/3/2/2009). Substation thus included in Oya Energy Facility EIA and in grid infrastructure BA (this application) to allow for handover to Eskom.

² Substation authorised as part of Kudusberg WEF (14/12/16/3/3/1/1976/AM1). Substation includes Eskom portion and IPP portion. Oya Energy now applying to have 33kV yard portion of substation authorised as part of this grid infrastructure BA application. Substation thus included in grid infrastructure BA (this application) to allow for handover to Eskom.

PHOTOGRAPHS OF SITE:





Figure i: General characteristics of the study area

The area proposed for development is located within an undulating landscape within which the predominant land use is game grazing. It is a semi-arid region and the vegetation is characteristic of the Succulent Karoo Biome. The area is covered in varying densities of knee-high scrub. There is a farmhouse and numerous jeep tracks across the large farm property but the site remains predominantly natural and very isolated. Natural ephemeral streams (currently dry) and man-made sources of water were observed. This natural pattern extends beyond the site in all directions, with the exception of the under construction Perdekraal East WEF (situated approximately 20km from the site) as well as the proposed Kudusberg WEF (authorised under 14/12/16/3/3/1/1976/AM1) and Oya Energy Facility (14/12/16/3/3/2/2009).

All relevant project technical details have been included in **Table i** below.

Table i: Technical Details

PROJECT	DEFF REFERENCE	FARM NAMES AND AREA
Oya 132kV Power Line	<u>To be Allocated</u>	<p><u>Oya Substation:</u></p> <ul style="list-style-type: none"> ▪ Remainder of the Farm Baakens Rivier No 155 <p><u>Kudusberg Substation:</u></p> <ul style="list-style-type: none"> ▪ Remainder of the Farm Matjes Fontein No 194 <p>Area of Oya and Kudusberg substation and O&M building sites (combined) = 8 hectares (ha) (namely 4ha each)</p> <p><u>Kudusberg to Oya Power Line Corridor:</u></p> <ul style="list-style-type: none"> ▪ Remainder of the Farm Matjes Fontein No 194 ▪ Portion 1 of the Farm Amandelboom No 158 ▪ Remainder of the Farm Oliviers Berg No 159 ▪ Remainder of the Farm Gats Rivier No 156 ▪ Portion 1 of the Farm Gats Rivier No 156 ▪ Remainder of the Farm Baakens Rivier No 155 <p>Kudusberg to Oya Power Line Corridor = Approx. 16.6km in length</p> <p><u>Preferred Oya to Kappa Power Line Corridor (Alternative 4):</u></p> <ul style="list-style-type: none"> ▪ Remainder of the Farm Baakens Rivier No. 155 ▪ Portion 4 of the Farm Bantamsfontein No. 168 ▪ Portion 13 of the Farm Bantamsfontein No. 168 ▪ Remainder of the Farm Lower Roodewal No. 169 ▪ The Farm Platfontein No. 240 ▪ The Farm Die Brak No. 241 ▪ Remainder of the Farm Rietpoort No. 243 <p>Preferred Oya to Kappa Power Line Corridor (namely Alternative 4) = Approx. 32.94km in length</p>
TECHNICAL DETAILS OF ASSOCIATED INFRASTRUCTURE		

	Access roads	<ul style="list-style-type: none"> ▪ Internal access roads will be required. Proposed power line requires 31m wide servitude for maintenance purposes; ▪ Servitude will be positioned within assessed power line corridors; and ▪ Existing site roads will be used wherever possible. However, where required, internal access roads will be constructed.
	Substations	<ul style="list-style-type: none"> ▪ Two (2) 33/132 kilovolt (kV) on-site Eskom substations. Referred to as Oya on-site Eskom Substation¹ and Kudusberg on-site Eskom Substation²; ▪ To serve Oya Energy Facility (part of separate on-going EIA process with DEFF Ref No.: 14/12/16/3/3/2/2009) and other renewable energies facilities owned by the applicant; ▪ Will occupy areas of up to approx. 4ha each; ▪ Will likely be single storey buildings, however, some components will be higher; ▪ Will be step-up substations which will contain transformers for voltage step-up from medium voltage to high voltage. Direct Current (DC) power will be converted into Alternating Current (AC) power in inverters and voltage will be stepped up to medium voltage in inverter transformers; ▪ Substations will connect proposed Oya Energy Facility as well as potentially nearby developments into Kappa Substation, from where electricity will be fed into the national grid (Figure i); and ▪ Substations require separate EAs, in order to allow EAs to be handed over to Eskom.
	Overhead Power Line	<ul style="list-style-type: none"> ▪ One (1) new overhead power line with voltage capacity of up to approx. 132kV; ▪ Will link Kudusberg substation² to Oya substation¹ and finally to Kappa Substation, where electricity will be fed into national grid; ▪ Grid connection is thus to Kappa Substation; ▪ Type of power line towers being considered at this stage include both lattice and monopole towers; ▪ Assumed these towers will be located approximately 200m to 250m apart; ▪ Towers will be up to 45m in height, depending on terrain, but will ensure minimum overhead line clearances from buildings and surrounding infrastructure; and ▪ Location of towers may change during final design stages but would be within assessed and approved servitude.

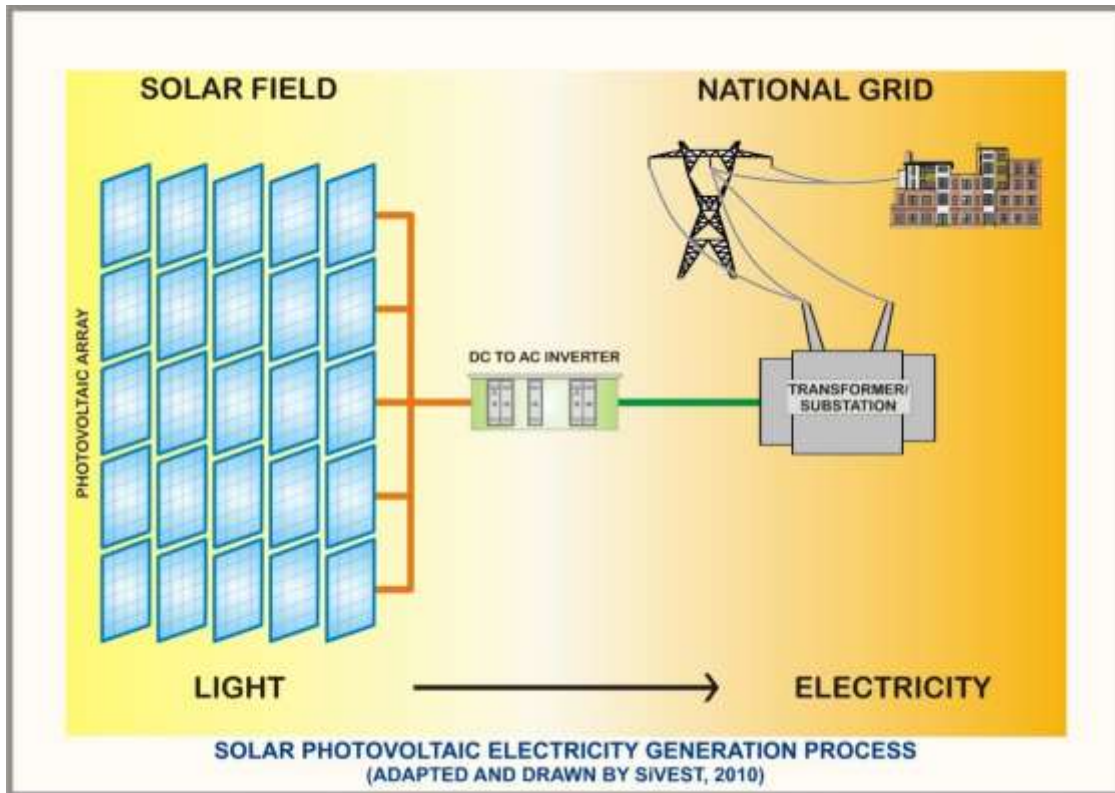


Figure i: Conceptual electricity generation process showing electrical connections

FUTURE PLANS AFTER DECOMMISSIONING / POTENTIAL UPGRADE: The initial lifespan of the proposed development is proposed to be approximately 20 years, based on the typical PPA terms. Technically, through suitable maintenance and upgrade activities, the proposed development could run for an additional 10 to 20 years, should the off taker see a need for the continued need for the electricity being generated.

However, since the EA for the proposed power line and substation will be handed over to Eskom, the lifespan of the proposed development is expected to exceed the PPA agreement. Despite this, should the proposed development be decommissioned, the project site would be decommissioned, and the affected properties restored to as near to their original states as possible, as detailed by the Final EMPr (**Appendix 8**). It should be noted that this would ultimately be the responsibility of Eskom, since the proposed power line and 33kV yard portions of the proposed substations will be owned and operated by Eskom.

All maps included in the report are included in **Appendix 5**.

EXECUTIVE SUMMARY

Oya Energy (Pty) Ltd (hereafter referred to as “Oya Energy”) is proposing to construct a 132kV overhead power line and 33/132kV substations near Matjiesfontein in the Western and Northern Cape Provinces (hereafter referred to as the “proposed development”) (DEFF Ref No.: **To be Allocated**). The overall objective of the proposed development is to feed the electricity generated by the proposed Oya Energy Facility (part of separate on-going EIA process with DEFF Ref No.: 14/12/16/3/3/2/2009) as well as potentially the nearby developments into the national grid. The grid connection and substations (this application) require a separate Environmental Authorisation (EA), in order to allow the EA to be handed over to Eskom.

In terms of the EIA Regulations (as amended) [promulgated in Government Gazette 40772 and Government Notice (GN) R326, R327, R325 and R324 on 7 April 2017], various aspects of the proposed development are considered listed activities which may have an impact on the environment and therefore require authorisation from the National Department of Environment, Forestry and Fisheries (DEFF) prior to the commencement of such activities. However, the relevant provincial authorities (namely the Western Cape Department of Environmental Affairs and Development Planning - WC DEA&DP and Northern Cape Department of Environment and Nature Conservation – NC DENC), as well as CapeNature, and other relevant Organs of State (OoS) will also be consulted.

SiVEST SA (Pty) Ltd Environmental Division (“SiVEST”) has been appointed by Oya Energy as the independent Environmental Assessment Practitioner (EAP) to undertake the BA process for the proposed Oya power line and 33/132kV substations.

It should be noted that the entire extent of the proposed 132kV overhead power line is located within one (1) of the Strategic Transmission Corridors as defined and in terms of the procedures laid out in Government Notice (GN) No. 113 of 16 February 2018, namely the Central Corridor. The proposed overhead power line and substation project irrespective of this would be subject to a BA process in terms of the National Environmental Management Act (Act 107 of 1998) (NEMA) (as amended) and Appendix 1 of the EIA Regulations, 2014, promulgated in Government Gazette 40772 and GN R326, R327, R325 and R324 on 7 April 2017.

The BA process for the proposed development will be conducted in accordance with the EIA Regulations, 2014 (as amended), promulgated in terms of Chapter 5 of the NEMA (as amended). All relevant legislation and guidelines, including the Equator Principles, have been consulted during the BA process and will be complied with at all times.

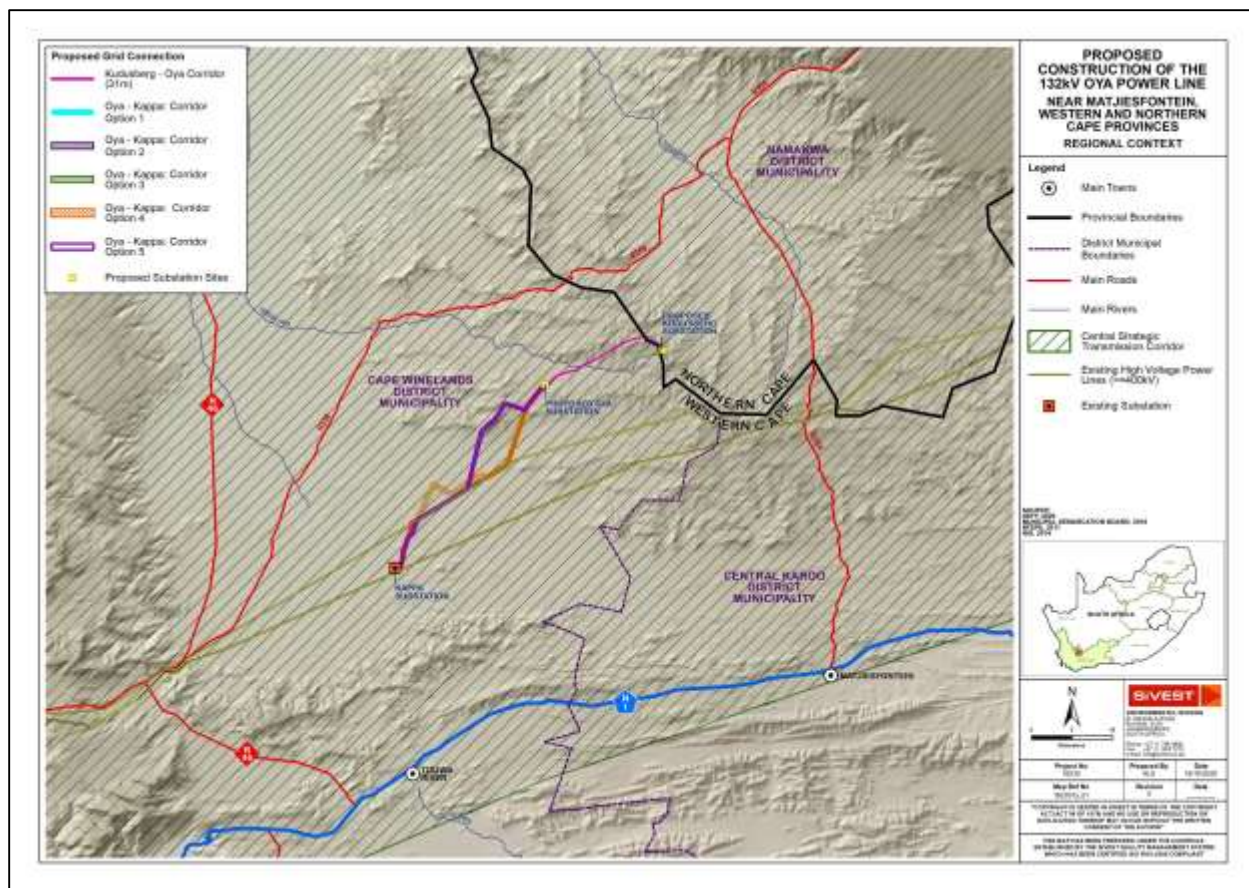


Figure ii: Proposed development in the regional context

OYA GRID: KUDUSBERG TO OYA POWER LINE CORRIDOR ROUTE ³				
CENTRE LINE COORDINATES (DD MM SS.sss)				
CORRIDOR	START POINT (KUDUSBERG SUB)	MIDDLE POINT	END POINT (OYA SUB)	APPROX LENGTH (KM)
Kudusberg to Oya	S32° 52' 6.431"	S32° 52' 22.996"	S32° 54' 24.448"	16.6
	E20° 21' 51.032"	E20° 17' 13.070"	E20° 12' 28.565"	
OYA GRID: PREFERRED POWER LINE CORRIDOR ROUTE ALTERNATIVE (OYA TO KAPPA) ⁴				
CENTRE LINE COORDINATES (DD MM SS.sss)				
CORRIDOR ALTERNATIVE	START POINT (OYA SUB)	MIDDLE POINT	END POINT (KAPPA SUB)	APPROX LENGTH (KM)
Alternative 4 (Oya to Kappa)	S32° 54' 24.448"	S33° 0' 51.986"	S33° 6' 29.185"	32.94
	E20° 12' 28.565"	E20° 6' 19.061"	E20° 0' 40.626"	

For the purpose of this BA, corridors of up to approximately 300m wide (i.e. 150m on either side of power line) were assessed for the proposed power line corridor routes (including alternatives for Oya to Kappa

³ Only one (1) route possible for section of proposed power line which connects Kudusberg substation to Oya substation (i.e. Kudusberg to Oya route). No alternatives can therefore be provided for this section of proposed power line

⁴ Five (5) power line corridor route alternatives provided for section of proposed power line which connects Oya substation to Kappa substation (i.e. Oya to Kappa route)

route). This is to allow for flexibility to route the power line within the authorised corridors. The proposed 132kV power line will however only require a 31m wide servitude and as such, this servitude (and proposed power line) would be positioned within the assessed corridors.

OYA GRID: SUBSTATION SITE COORDINATES			
SUBSTATION	AREA (HECTARES)	CENTRE POINT COORDINATES	
		SOUTH	EAST
33/132kV Oya Substation ⁵	4	S32° 54' 24.448"	E20° 12' 28.565"
33/132kV Kudusberg Substation ⁶	4	S32° 52' 9.50"	E20° 21' 47.01"

Refer to **Appendix 9A** for the full list of project coordinates, including all the bending points of the proposed power line corridors (including alternatives), from the starting point to the finishing point.

The proposed development is located approximately 50km north-west of the town of Matjiesfontein, in the Western and Northern Cape Provinces. The development area assessed by the specialists incorporated twenty-one (21) farm portions within the Witzenberg and Karoo Hoogland Local Municipalities, in the Cape Winelands and Namakwa District Municipalities respectively. However, only twelve (12) farm portions are affected by the substations, power line corridor associated with the Kudusberg to Oya route and preferred power line corridor alternative associated with the Oya to Kappa power line route (namely Alternative 4). These include the following:

- Remainder of the Farm Baakens Rivier No 155
- Portion 1 of the Farm Gats Rivier No 156
- Remainder of the Farm Gats Rivier No 156
- Portion 1 of the Farm Amandelboom No 158
- Remainder of the Farm Oliviers Berg No 159
- Portion 4 of the Farm Bantamsfontein No 168
- Portion 13 of the Farm Bantamsfontein No 168
- Remainder of the Farm Lower Roodewal No 169
- Remainder of the Farm Matjes Fontein No 194
- The Farm Platfontein No 240
- The Farm Die Brak No 241
- Remainder of the Farm Rietpoort No 243

At this stage, it is anticipated that the proposed development will include the following components:

- Two (2) 33/132kV on-site substations (namely the Oya on-site Eskom Substation⁵ and Kudusberg on-site Eskom Substation⁶) to serve the Oya Energy Facility (part of separate on-going EIA process with **DEFF Ref No.:** 14/12/16/3/3/2/2009) and Kudusberg WEF (authorised under 14/12/16/3/3/1/1976/AM1), occupying an area of up to approximately 4 hectares (ha) each. The proposed substations will be step-up substations and require a separate EA, in order to allow the EA to be handed over to Eskom; and

⁵ Substation includes Eskom portion and IPP portion. Substation also forms part of Oya Energy Facility (separate on-going EIA process with DEFF Ref No.: 14/12/16/3/3/2/2009). Substation thus included in Oya Energy Facility EIA and in grid infrastructure BA (this application) to allow for handover to Eskom.

⁶ Substation authorised as part of Kudusberg WEF (14/12/16/3/3/1/1976/AM1). Substation includes Eskom portion and IPP portion. Oya Energy now applying to have 33kV yard portion of substation authorised as part of this grid infrastructure BA application. Substation thus included in grid infrastructure BA (this application) to allow for handover to Eskom.

- A new 132kV overhead power line connecting the Kudusberg substation (authorised under 14/12/16/3/3/1/1976/AM1⁶) to the Oya substation⁵ and finally the Kappa Substation, from where the electricity will be fed into the national grid. The type of power line towers being considered at this stage include both lattice and monopole towers and it is assumed that these towers will be located approximately 200m to 250m apart. The towers will be up to 45m in height, depending on the terrain, but will ensure minimum overhead line clearances from buildings and surrounding infrastructure.

Refer to **Appendix 9A** for the full list of project coordinates.

The following assessments were conducted prior to and during the BA in order to identify and assess the issues associated with the proposed development:

- Desktop Agricultural and Soils Impact Assessment;
- Surface Water Impact Assessment;
- Avifauna Impact Assessment;
- Heritage Impact Assessment, including⁷;
 - Archaeology;
 - Palaeontology;
 - Cultural Landscapes;
- Socio-Economic Impact Assessment;
- Terrestrial Ecology Impact Assessment; and
- Visual Impact Assessment.

These studies were undertaken to inform the impact assessment of the proposed development. It should be noted that the specialists assessed the proposed substation sites and power line corridors (including alternatives) as part of their respective assessments and also focused on specific impacts of the proposed development area and power line and substation infrastructure in detail. In addition, various specialists (namely Surface Water, Avifauna, Heritage and Terrestrial Ecology) undertook detailed walkdowns of the proposed layout. This was undertaken to identify any environmentally sensitive / “no-go” areas to be avoided in order for the final layout to be approved by the DEFF as part of this BA process.

Based on the specialist assessments, a few potentially sensitive and/or “no-go” areas have been identified within the study area. These sensitive areas were subsequently used to inform the area for the potential erection of the substations and 132kV overhead power line. In addition, the sensitive areas also informed the assessment of power line corridor route alternatives (see **section 8**), which have been comparatively assessed by the respective specialists during the BA process (including assessment of the ‘no-go’ alternative (i.e. *status quo*). It should be noted that the proposed layout was refined to avoid environmental sensitivities / “no-go” areas prior to the submission of the Application for EA and Draft BA Report (DBAR).

No site alternatives were considered for the proposed substations as the placement of the substations were determined during the EIA process for the proposed Oya Energy Facility (DEFF Ref No.: 14/12/16/3/3/2/2009) as well as the BA process for the authorised Kudusberg WEF (14/12/16/3/3/1/1976/AM1)⁸. As mentioned, only one (1) route is possible for the proposed Kudusberg to

⁷ Archaeology, Palaeontology and Cultural Landscapes all form part the Heritage Impact Assessment (HIA). In addition, HIA has been undertaken in line with the requirements of Heritage Western Cape (HWC)

⁸ Substations will connect proposed Oya Energy Facility (part of separate on-going EIA process with DEFF Ref No.: 14/12/16/3/3/2/2009) as well as potentially nearby developments into Kappa Substation

Oya power line corridor route. No alternatives can therefore be provided for this power line route. Five (5) power line corridor route alternatives have however been provided for the proposed Oya to Kappa power line corridor route (see **section 8**).

The results of the comparative assessment of alternatives are summarised in **Table ii** below and are presented in **section 8.1** of this DBAR.

The proposed development area (including alternatives) assessed as part of this assessment and in relation to the identified environmental sensitive and/or “no-go” areas is presented in **Figure iii** below.

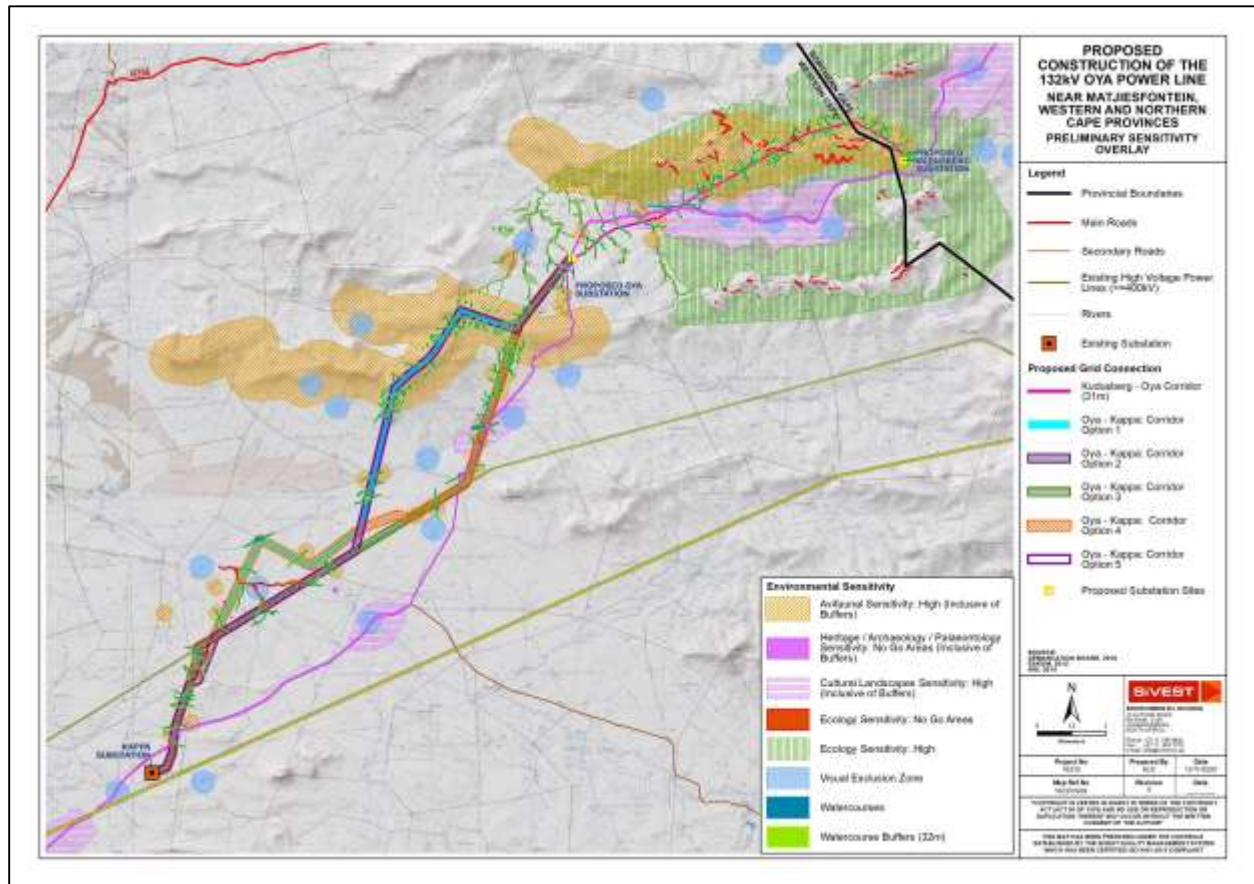


Figure iii: Proposed development area and alternatives in relation to environmental sensitive / ‘no-go’ areas⁹

⁹ Preliminary layout (including alternatives) which was assessed as part of BA process was amended to avoid all sensitive and/or ‘no-go’ areas identified as well as all recommended buffers

Key

PREFERRED	The alternative will result in a low impact / reduce the impact
FAVOURABLE	The impact will be relatively insignificant
LEAST PREFERRED	The alternative will result in a high impact / increase the impact
NO PREFERENCE	The alternative will result in equal impacts

Table ii: Summary of comparative assessment of alternatives

POWER LINE CORRIDOR ROUTE ALTERNATIVES (OYA TO KAPPA)					
Specialists	Power Line Corridor Alternative 1	Power Line Corridor Alternative 2	Power Line Corridor Alternative 3	Power Line Corridor Alternative 4	Power Line Corridor Alternative 5
Surface Water	No preference	No preference	Preferred	Preferred	No preference
Ecology	Least preferred	Least preferred	Preferred	Favourable	Least preferred
Heritage (including Archaeology, Palaeontology and Cultural Landscapes)	Least preferred	Least preferred	Least preferred	Preferred	Least preferred
Visual	Favourable	Favourable	Preferred	Favourable	Favourable
Socio-Economic	No preference	No preference	No preference	No preference	No preference
Agriculture	Preferred	Preferred	Preferred	Preferred	Preferred
Birds	Least preferred	Favourable	Preferred	Least preferred ¹⁰	Favourable
Fatal Flaw	No	No	No	No	No
PREFERRED (YES / NO)	-	-	-	YES	-

As depicted in **Table i** above, **Power Line Corridor Alternative 4 (Oya to Kappa)** was deemed to be the preferred alternative from an environmental perspective and is **being proposed for authorisation**. This is due to the fact that three (3) of the specialists found this alternative to be “Preferred”. These include Aquatic, Heritage (which includes Archaeology, Palaeontology and Cultural Landscapes) and Agriculture. In addition, this alternative was deemed to be “Favourable” from Visual and Terrestrial Ecology perspectives respectively, while the Socio-Economic specialist found this alternative to have “No Preference”¹¹. The above-mentioned Power Line Corridor Alternative is also preferred from a technical perspective.

In light of the information above, **Power Line Corridor Alternative 4 (Oya to Kappa)** the the preferred alternative from an environmental perspective and is being proposed for authorisation.

¹⁰ Despite being “Least Preferred”, this alternative was not found to be fatally flawed, as confirmed by the specialist (see **Appendix 6B**)

¹¹ Avifauna specialist found Power Line Corridor Alternative 4 to be “Least Preferred” as it is the second longest option and only two (2) small sections run next to existing HV lines, and therefore it mostly creates new collision risks where it did not exist before. Despite this, this alternative was not found to be fatally flawed, as confirmed by specialist (see **Appendix 6B**)

As mentioned, no site alternatives were considered for the proposed substation sites as the placement of the substations were determined during the EIA process for the proposed Oya Energy Facility as well as the BA process for the authorised Kudusberg WEF⁸.

Based on the inputs from the respective specialists regarding the proposed layout (including a comparative assessment of the power line corridor route alternatives), the following alternatives are being proposed for authorisation:

- **Kudusberg to Oya Power Line Corridor Route;**
- **Oya on-site Eskom Substation;**
- **Kudusberg on-site Eskom Substation;** and
- **Power Line Corridor Alternative 4 (Oya to Kappa).**

It is requested that the above-mentioned alternatives, and therefore the proposed layout, be authorised by the DEFF. It must be noted that the specialist sensitivities and “no-go” areas were used to inform the proposed layout, including the location of all alternatives, and have been incorporated into the layout design of the preferred site layout (**Figure iv**). In addition, no fatal flaws were identified and therefore the layout being proposed (including all alternatives) is considered to be acceptable, although not necessarily preferable from an environmental perspective.

The preferred site layout in relation to the sensitive and “no-go” areas identified by the specialists is indicated in **Figure vii** below.

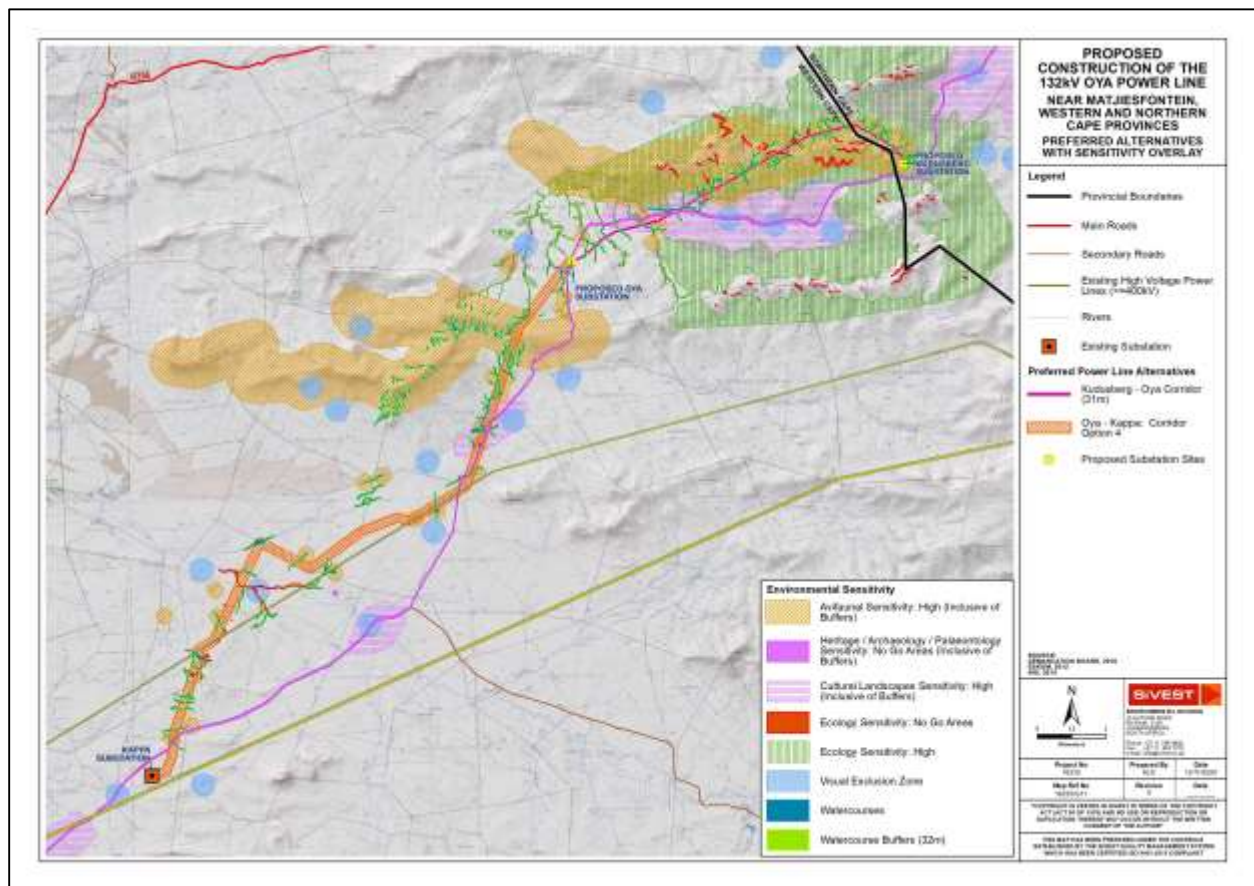


Figure iv: Preferred site layout in relation to identified environmental sensitive and “no-go” areas

Table ii below summarises the specialist findings of the BA process for the entire proposed development.

Table ii: Summary of Specialist findings

Specialist	Key findings	Impacts	Impact pre mitigation	Impact post mitigation
Specialist Studies				
Agricultural and Soils Compliance Statement	<p>The key findings include:</p> <ul style="list-style-type: none"> ▪ The aridity of the area is a significant agricultural constraint that seriously limits the level of agricultural production (including grazing) which is possible across the site. ▪ Shallow, sandy soils on underlying rock or carbonate hardpan are a further agricultural limitation. ▪ As a result of these limitations, the study area is unsuitable for cultivation and agricultural land use is limited to low density grazing. The majority of land within the development area is classified as low agricultural sensitivity by the screening tool, but includes areas of medium sensitivity. ▪ The only possible agricultural impact is minimal soil and land degradation (erosion and topsoil loss) as a result of land disturbance during construction and decommissioning. ▪ The conclusion of this assessment is that the proposed development will not have an unacceptable negative impact on the agricultural production capability of the site. The proposed development is therefore acceptable. This is substantiated by the facts that the land is of very low agricultural potential, the amount of agricultural land loss is insignificant, and that the proposed development poses a low risk in terms of causing soil degradation. ▪ From an agricultural impact point of view, it is recommended that the proposed development be approved. 	Please refer to Section 9 of Agriculture and Soils Compliance Statement (Appendix 6A of DBAR)		
Surface Water (including walkdown)	The purpose of the Surface Water Impact Assessment Report is to define the ecology of the proposed development in terms of the watercourse characteristics, including mapping of the natural watercourse, defining areas of increased Ecological Importance and Sensitivity (EIS), and defining the Present Ecological State (PES) of the watercourses associated with the proposed development. The Department of Water and Sanitation (DWS) Risk Assessment Matrix as promulgated in Government Notice 509 as published in the Government Gazette 40229 of 2016 as it relates to the National Water Act, 1998 (Act No. 36 of 1998) (NWA) and EIA Regulations, 2014 (as amended) in terms of the NEMA was applied to determine the significance of the impacts associated	Construction Phase		
		Direct Impacts		
		Watercourse drivers and receptors such as hydrology, water quality (when surface water is present), geomorphology, habitat and biota.	- Medium	- Low
		Indirect Impacts		
Watercourse drivers and receptors such as	- Low	- Low		

Specialist	Key findings	Impacts	Impact pre mitigation	Impact post mitigation
	with the proposed development and mitigatory measures were identified which aim to minimise the potential impacts.	hydrology, water quality (when surface water is present) and geomorphology		
	During the site visit undertaken on the 22 nd to 24 th of October 2020, several ephemeral tributaries with riparian vegetation, ephemeral rivers and episodic drainage lines (EDLs) without riparian vegetation were identified in the investigation area. Although these episodic drainage lines cannot be classified as rivers or streams in the traditional sense thereof due to the lack of saturated soils and riparian vegetation, they do still function as waterways, through episodic conveying of water. Based on the definition of a watercourse as per the National Water Act, 1998 (Act No. 36 of 1998), water does flow regularly or intermittently within these drainage lines, conveying water from the upgradient catchment area into the downgradient tributaries and the ephemeral rivers. As such, they can be considered as watercourses due to their importance for hydrological functioning and therefore enjoy protection in terms of the National Water Act, 1998 (Act No. 36 of 1998). Several areas hosting episodic preferential flow paths (PFP) were also identified. As with the EDLs, these preferential flow paths also lack riparian and wetland characteristics and may potentially only convey surface water for a short period of time after rainfall events. Thus, these features are not considered of ecological importance but contributes to the hydrological functioning of the drainage systems at large. The PFP cannot be considered as watercourses (thus no ecological assessment undertaken) and may potentially only enjoy protection in terms of the National Water Act, 1998 (Act No. 36 of 1998) should a floodline be applicable to these features. The results of the ecological assessment of the watercourses are discussed in Section 6.1 of the Surface Water Impact Assessment Report.	Watercourse drivers and receptors such as vegetation, geomorphology and sediment balance.	- Low	- Low
		Operation Phase		
		Indirect Impacts		
		Watercourse drivers and receptors such as vegetation, geomorphology and sediment balance.	- Low	- Low
		Decommissioning Phase		
		Direct Impacts		
		Watercourse drivers and receptors such as hydrology, water quality (when surface water is present), geomorphology, habitat and biota.	- Medium	- Low
		Cumulative		
		Direct Impacts		
		Drainage system habitat integrity and hydrological functioning	- Medium	- Low
		'No-Go'		
	Direct negative medium impacts associated with creating new access roads to service the power line and substation development are expected to occur to the watercourse drivers and receptors during the construction phase. Should the	No-Go Alternative (the option of not fulfilling the proposed project)	+ Low	+ Low

Specialist	Key findings	Impacts	Impact pre mitigation	Impact post mitigation
	<p>recommended mitigation measures be implemented with specific mention of only installing pylons outside the delineated extent of the watercourses and its associated 32m NEMA Zone of Regulation, a negative low impact significance is expected to occur. It is therefore recommended that the mitigation measures as stipulated in Table 10 and 11 and the good housekeeping measures as per Appendix F be implemented to prevent and direct/indirect impacts from occurring on the watercourses. None of the proposed power line development alternatives are considered fatally flawed, however preference is given to power line alternative 3 and 4 since these power line routes are routed along existing power line infrastructure which has already incurred environmental disturbances and have existing access roads which may be utilised during the current proposed construction and operational phases of the power line between the Oya Energy Facility and the Kappa substation, and these power line alternatives are considered to have the least amount of watercourse crossings. As such, it is the opinion of the freshwater specialist that EA may be granted for the proposed development. Should the construction of the road crossings in the watercourses be undertaken in the driest period of the year when no surface flow is present and the recommended mitigation measures are applied, the risk significance of the proposed development can be reduced and Water Use Authorisation by means of General Authorisation (GA) in terms of Section 21(c) and (i) water uses may potentially be obtained in consultation with the Department of Water and Sanitation (DWS). However, the DWS, the custodian of water resources in South Africa, must be consulted with regards to the outcome of this assessment.</p> <p>Based on the findings of the freshwater ecological assessment and the results of the impact and risk assessments, it is the opinion of the ecologist that the proposed development poses a negative low risk to the integrity of the watercourses in the investigation area provided that adherence to cogent, well-conceived and ecologically sensitive construction plans are implemented and the mitigation measures provided in this report as well as general good construction practice are adhered to, the development is considered acceptable.</p>			
Avifauna (including walkdown)	The proposed development will have several direct impacts on priority avifauna. No indirect impacts are envisaged. Direct impacts can be summarised as follows:	Planning Phase None Construction Phase Direct Impacts		

Specialist	Key findings	Impacts	Impact pre mitigation	Impact post mitigation
	<ul style="list-style-type: none"> Displacement of priority species due to habitat destruction in the substation footprint, and due to disturbance associated with the construction activities. Mortality of priority species due to electrocutions in the substation yard. Mortality of priority species due to collisions with the 132kV OHL. 	Displacement of priority species due to habitat destruction in the substation footprint	- Low	- Low
	<p>CONSTRUCTION PHASE</p> <p><i>Displacement of priority species due to habitat destruction in the substation footprint and disturbance associated with the construction activities</i></p> <p>Construction activities could impact on birds breeding, foraging and roosting in or in close proximity of the proposed transmission substation through transformation of habitat, which could result in temporary or permanent displacement. Unfortunately, very little mitigation can be applied to reduce the significance of this impact as the total permanent transformation of the natural habitat within the construction footprint of the substation yard is unavoidable. Fortunately, due to the nature of the vegetation, and judged by the existing power lines, very little if any vegetation clearing will be required in the power line servitudes. The habitat in the study area is very uniform from a bird impact perspective; therefore, the loss of habitat for priority species due to direct habitat transformation associated with the construction of the proposed substation is likely to be fairly minimal. The species most likely to be directly affected by this impact would be small, non-Red Data species.</p> <p>Apart from direct habitat destruction, the above-mentioned activities also impact on birds through disturbance; this could lead to breeding failure if the disturbance happens during a critical part of the breeding cycle. Construction activities in close proximity to breeding locations could be a source of disturbance and could lead to temporary breeding failure or even permanent abandonment of nests. A potential mitigation measure is the timeous identification of nests and the timing of the construction activities to avoid disturbance during a critical phase of the breeding cycle, although in practice that can admittedly be very challenging to implement. Large terrestrial species namely Ludwig's Bustard, Karoo Korhaan and Southern Black Korhaan are most likely to be affected by displacement due</p>	Displacement of priority species due to disturbance associated with the construction activities	- Medium	- Low
		Indirect Impacts		
		None		
		Operation Phase		
		Direct Impacts		
		Mortality of priority species due to electrocutions in the substation yard	- Medium	- Low
		Mortality of priority species due to collisions with the 132kV OHL	- Medium	- Medium
		Indirect Impacts		
		None		
		Decommissioning Phase		
		Direct Impacts		
		Displacement of priority species due to disturbance associated with the decommissioning activities	- Low	- Low
		Indirect Impacts		
		None		
		Cumulative		
		Direct Impacts		

Specialist	Key findings	Impacts	Impact pre mitigation	Impact post mitigation
	to disturbance. Cliff-nesting Jackal Buzzards, Booted Eagles, Verreaux's Eagles and Black Storks could also potentially be vulnerable to this impact.	Displacement of priority species due to habitat destruction in the substation footprint	- Low	- Low
	The priority species which are potentially vulnerable to this impact are listed in Table 2 of the Avifauna Impact Assessment Report (Appendix 6B).	Displacement of priority species due to disturbance associated with the construction activities	- Medium	- Low
	This impact is assessed to be medium to low and can be reduced to low through mitigation.	Mortality of priority species due to electrocutions in the substation yard	- Medium	- Low
	OPERATIONAL PHASE <i>Electrocutions in the substation yard</i> Electrocution refers to the scenario where a bird is perched or attempts to perch on the electrical structure and causes an electrical short circuit by physically bridging the air gap between live components and/or live and earthed components (Van Rooyen 2004). The electrocution risk is largely determined by the pole/tower design. In the case of the proposed power lines, no electrocution risk is envisaged because the proposed design of the 132kV line, namely the steel monopole and self-supporting lattice structures, should not pose an electrocution threat to any of the priority species which are likely to occur in the study area. Electrocutions within the proposed substation yard are possible but should not affect the more sensitive Red Data bird species, as these species are unlikely to use the infrastructure within the substation yard for perching or roosting. Species that are more vulnerable to this impact are corvids, owls and certain species of waterbirds.	Mortality of priority species due to collisions with the 132kV OHL	- Medium	- Medium
	The priority species which are potentially vulnerable to this impact are listed in Table 2 of the Avifauna Impact Assessment Report (Appendix 6B).	Displacement of priority species due to disturbance associated with the decommissioning activities	- Low	- Low
	This impact is assessed to be low and can be further reduced through mitigation.	Indirect Impacts		
	<i>Collisions with the 132kV OHL</i> Collisions are the biggest threat posed by transmission lines to birds in southern Africa (Van Rooyen 2004). Most heavily impacted upon are bustards, storks, cranes and various species of waterbirds, and to a lesser extent, vultures. These species are mostly heavy-bodied birds with limited manoeuvrability, which makes it difficult for them to take the necessary evasive action to avoid colliding	None		
		'No-Go'		
		Direct Impacts		
		None		
		Indirect Impacts		
		None		

Specialist	Key findings	Impacts	Impact pre mitigation	Impact post mitigation
	<p>with transmission lines (Van Rooyen 2004, Anderson 2001). The most likely Red Data candidates for collision mortality on the proposed OHL are large terrestrial species e.g. bustards, korhaans and Secretarybird, certain raptors and storks, particularly Verreaux’s Eagles, Jackal Buzzards and Black Storks where the line drops down the escarpment, and waterbirds at drainage lines and waterbodies.</p> <p>The priority species which are potentially vulnerable to this impact are listed in Table 2 of the Avifauna Impact Assessment Report (Appendix 6B).</p> <p>This impact is assessed to be medium and can be reduced through mitigation, but it will remain at medium level after mitigation.</p> <p>Environmental sensitivities</p> <p>The following environmental sensitivities were identified from an avifaunal perspective for the proposed power line grid connections:</p> <ul style="list-style-type: none"> ▪ High sensitivity (Mitigation required): Surface water <p>Included are areas within 300m of water troughs and earth dams, and all major drainage lines. Surface water in this semi-arid habitat is crucially important for priority avifauna, including several Red Data species such as Martial Eagle, Lanner Falcon, Verreaux’s Eagle and Black Stork and many non-priority species. Drainage lines when flowing also attract waterbirds on occasion, as do the large pools that remain in the channel after the flow has stopped. Power lines that are routed near these sources of surface water pose a collision risk to birds using the water for drinking and bathing, and drainage lines, when flowing, are natural flight paths for birds. These areas will require mitigation with Bird Flight Diverters (BFDs).</p> <ul style="list-style-type: none"> ▪ High sensitivity (Mitigation required): Cliffs <p>The proposed OHL runs down two escarpment areas, where it will pose a risk to cliff nesting species such as Verreaux’s Eagle, Booted Eagle, Lanner Falcon, Jackal Buzzard and Black Stork. These species all use the declivity wind currents along the cliff faces and slopes for lift and they will be at risk of collisions</p>			

Specialist	Key findings	Impacts	Impact pre mitigation	Impact post mitigation			
	<p>with the OHL where it traverses these cliffs and slopes. These areas will require mitigation with BFDs.</p> <ul style="list-style-type: none"> ▪ Medium sensitivity (Mitigation preferred): Succulent Karoo <p>The entire study area is rated as medium sensitivity due to the regular presence of collision-prone species such as Ludwig's Bustard, Karoo Korhaan and Southern Black Korhaan. It would therefore be advisable to mitigate the whole OHL with BFDs if possible.</p> <p>Conclusion The proposed Oya 132kV OHL is expected to have a medium impact on priority species. This impact could be reduced to low through the application of appropriate mitigation measures. No fatal flaws were discovered in the course of the investigations.</p> <p>Impact Statement Based on the outcome of the investigations into the impact of the proposed 132kV OHL on avifauna, the authorization of the OHL is supported, provided the mitigation measures contained in this specialist report are strictly implemented. The proposed layout is acceptable from an avifauna perspective and should be approved as part of the EA.</p>						
Heritage (including walkdown), including: <ul style="list-style-type: none"> ▪ Archaeology ▪ Palaeontology ▪ Cultural Landscapes 	<p>Anticipated Impacts on Heritage Resources: Some significant heritage resources are located within the 300m (150m x2) corridor for the proposed Alternative 4 alignment. The lithic material identified is of low significance, and even though the resources may be destroyed during the construction, the impact is inconsequential for the majority of the heritage resources identified during the archaeological and palaeontological assessments conducted for this project. These are detailed in Table 4 of the Heritage Impact Assessment (HIA) Report and various mitigation measures are proposed in order to ensure that no impact to these resources takes place. These resources include archaeological sites 130734, 130981 and 131154 around which a buffer of 50m is proposed. Site 130730 is a burial ground site and is very sensitive in terms of impacts. As such, a 100m buffer area around this site is recommended.</p>	<p style="text-align: center;">HERITAGE IMPACTS (INCLUDING ARCHAEOLOGY, PALAEOLOGY AND CULTURAL LANDSCAPES)</p> <p style="text-align: center;">Planning and Design Phase</p> <p>No impacts to heritage resources are anticipated during this phase</p> <p style="text-align: center;">Construction Phase</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 60%;">Impacts to archaeological heritage resources</td> <td style="width: 20%; text-align: center;">- Medium</td> <td style="width: 20%; text-align: center;">- Low</td> </tr> </table>	Impacts to archaeological heritage resources	- Medium	- Low		
Impacts to archaeological heritage resources	- Medium	- Low					

Specialist	Key findings	Impacts	Impact pre mitigation	Impact post mitigation		
	<p>No significant fossils were identified during the field analysis. This is mostly due to the soil cover and lack of outcrop in the area. Only four fossils were identified in the field assessment and the fossils found were all silicified wood from the Abrahamskraal Formation. None of the samples were found in situ. However, significant palaeontological resources have been previously identified within the 300m corridor for Alternative 4 (SAHRIS Site IDs 130760, 130761, 130768 and 130772). 50m buffers are proposed around these sites to ensure that no impact takes place.</p> <p>The primary heritage impact anticipated for this proposed development is impact to the cultural landscape. Previous Cultural Landscape Assessments conducted in the immediate vicinity of the proposed OHL alignment have identified cultural landscape features of significance including the Cultural Landscape Areas of the Baakensrivier and the Gatsrivier, river confluences, ridge lines, outspans, the historic trunk road and where this road crosses rivers (road river crossings). Various mitigation measures are proposed to mitigate the negative impacts to the cultural landscape including buffer zones, 'no-go' areas and general development guidelines included in section 5.4 of the HIA Report. Importantly, this proposed OHL development is located within a REDZ area with many proposed and already authorised renewable energy facilities in its immediate proximity. In general, it is preferred for this kind of infrastructure to be concentrated on the landscape instead of sprawled out.</p> <p>Alternative 4 is preferred by the developer for the Oya to Kappa overhead power line corridor route, and in light of the above information, also in terms of impacts to heritage resources. The proposed development is unlikely to have a negative impact on significant heritage resources situated within the corridor for the proposed Oya OHL on condition that the proposed mitigation measures including buffer areas and 'no-go' areas are implemented.</p> <p>Recommendations:</p> <p>There is no objection to the proposed development on heritage grounds and the following is recommended:</p> <ul style="list-style-type: none"> Alternative Alignment 4 for the Oya to Kappa overhead power line corridor route is preferred in terms of impacts to heritage 	Impacts to palaeontological resources	- Medium	- Low		
		Impacts to the cultural landscape	- High	- Medium		
		Operation Phase				
		Impacts to archaeological heritage resources	- Medium	- Low		
		Impacts to palaeontological resources	- Medium	- Low		
		Impacts to the cultural landscape	- High	- Medium		
		Decommissioning Phase				
		Impacts to archaeological heritage resources	- Medium	- Low		
		Impacts to palaeontological resources	- Medium	- Low		
		Impacts to the cultural landscape	- High	- Medium		
		Cumulative				
		Impacts to archaeological heritage resources	- Medium	- Low		
		Impacts to palaeontological resources	- Medium	- Low		
		Impacts to the cultural landscape	- High	- Medium		
		'No-Go'				
		The 'no-go' option is a feasible option, however, this would prevent the proposed development from contributing to the environmental, social and				

Specialist	Key findings	Impacts	Impact pre mitigation	Impact post mitigation
	<ul style="list-style-type: none"> ▪ No mitigation is required prior to construction operations commencing. ▪ The recommended buffer areas and 'no-go' areas identified in Table 4 of the HIA Report must inform the final alignment and must be implemented during the construction phase. ▪ During the construction phase all excavations must be monitored for fossil remains by the responsible Environmental Control Officer (ECO) using the HWC Chance Fossil Finds Procedure. Should substantial fossil remains such as vertebrate bones and teeth, petrified wood, plant-rich fossil lenses or dense fossil burrow assemblages be exposed during construction, the responsible ECO should safeguard these, preferably in situ, and alert the South African Heritage Resources Authority (SAHRA) in the Northern Cape and HWC in the Western Cape so that appropriate action can be taken by a professional palaeontologist, ▪ Should 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 be found during the proposed development, SAHRA APM Unit (Natasha Higgitt/Phillip Hine 021 462 5402) in the Northern Cape and HWC in the Western Cape must be alerted. ▪ If unmarked human burials are uncovered in the Northern Cape, the SAHRA Burial Grounds and Graves (BGG) Unit (Mimi Seetelo 012 320 8490), and in the Western Cape, HWC must be alerted immediately as per section 36(6) of the NHRA. A professional archaeologist must be contracted as soon as possible to inspect the findings. A Phase 2 rescue excavation operation may be required subject to permits issued by SAHRA and/or HWC 	economic benefits associated with the development of the renewables sector		
Desktop Socio - Economic	<p>Comparative Assessment of Layout Alternatives</p> <p>Considered purely on a social basis, no clear route alternatives emerge in respect of any of these routes. Taking into account the results of other specialist studies that may have secondary social consequences, such as the archaeological; heritage; palaeontological and visual studies, no least preferred route emerges. Consequently, no social preference has emerged in respect of these 5 route alternatives.</p>	Planning and Design Phase		A sensitivity verification, undertaken on 08 October 2020, did not identify any socially linked restrictions, exclusions or prohibitions that apply to the proposed development site or any socially sensitive features on the site. It is therefore unlikely that any negative social impacts will be associated with the planning/pre-construction phase of the project.

Specialist	Key findings	Impacts	Impact pre mitigation	Impact post mitigation
	<p>The objective of the proposed development is to feed electricity generated by the proposed Oya Energy Facility into the National Grid and, as such, it is an integral component required to ensure the success of the Oya Energy Facility. An additional advantage of the power line is that it provides a potential opportunity to connect nearby developments to the grid, thus eliminating any need for additional infrastructure in the area. Once commissioned, the power line will be absorbed; operated and maintained by Eskom; thus resulting in the power line becoming an Eskom asset and eliminating any risk attached to privately owned transmission grid infrastructure. In this regard, Eskom indicates a commitment “...to developing the electricity supply industry by facilitating the integration of independent power producers (IPPs) into the national grid and buying electricity from IPPs for national distribution”.</p> <p>The entire extent of the proposed overhead power line and substations is located within the Central Strategic Transmission Corridor while also remaining within the boundaries of Renewable Energy Development Zone, Komsberg – REDZ 2 as delineated in GN No. 113.</p> <p>Regarding the negative impacts associated with the project, it is evident that most apply over the short term to the construction phase of the project. Of these impacts, all can be mitigated to within acceptable ranges and there are no fatal flaws associated with the construction or operation of the project. Although over the operational phase, the project will be visible and is likely to alter the sense of place of the area, this should be limited to the extent that it is placed within a REDZ and Strategic Transmission Corridor.</p> <p>In accordance with international and governmental requirements, the project will shift the country away from a high reliance on fossil fuels towards a far greener and cleaner energy generation mix. The proposed development also supports the objectives of the RMIPPPP, which serves as an “emergency” power generation programme for accelerated assistance to the national grid amid</p>	Construction Phase ¹²		
		Health & social well-being:		
		<ul style="list-style-type: none"> ▪ Air quality ▪ Noise ▪ Increase in crime ▪ Increased risk of HIV infections ▪ Influx of construction workers ▪ Hazard exposure 	- Low	- Low
		Quality of the living environment:		
		<ul style="list-style-type: none"> ▪ Disruption of daily living patterns 	- Low	- Low
		Economic:		
		<ul style="list-style-type: none"> ▪ Job creation and skills development ▪ Socio-economic stimulation 	+ Low	+ Low
		Operation Phase		
		Health & well-being:		
		<ul style="list-style-type: none"> ▪ Electromagnetic Fields 	- Low	- Low
	Quality of the living environment:			
	<ul style="list-style-type: none"> ▪ Transformation of the sense of place 	- Medium	- Medium	
	Economic:			
	<ul style="list-style-type: none"> ▪ Socio-Economic Stimulation 	+ Medium	+ Medium	

¹² The Socio-Economic Impact Assessment is based on perceptions and assumptions. It is thus not possible to address direct and indirect impacts as this creates a complicated situation. An example includes sense of place, which incorporates far more than just the visual aspect and is based on perceptions. The specialist was therefore unable to specify whether impacts were direct or indirect. Clarity has however been provided in the Socio-Economic Report (**Appendix 6D**), where possible.

Specialist	Key findings	Impacts	Impact pre mitigation	Impact post mitigation												
	<p>electricity supply constraints. The DMRE issued a RFP for the emergency procurement of 2000 MW of electricity. Due to the emergency nature of the RMIPPPP, the objective is to procure energy from projects that are near ready and can connect to the grid quickly. The proposed development is deemed to meet these requirements and can reduce the risk of load shedding. Grid capacity is also available and no deep grid works are required, which are beneficial for the connection timelines of the RMIPPPP.</p> <p>The Minister of Mineral Resources and Energy also recently welcomed the concurrence by the NERSA to the second Section 34 Ministerial Determination, which enables the Department to undertake procurement of additional electricity capacity in line with the IRP (2019). 6 800 MW of capacity is determined to be generated from renewable energy sources (PV and Wind), 513 MW from storage and 3 000 MW from gas. The proposed development will be able to contribute to this diverse electricity requirement and will thus actively contribute to the commitments made to increase generation capacity, and ensure the security of energy supply to society rapidly and significantly.</p> <p>Impact Statement</p> <p>Considering all social impacts associated with the project, it is evident that the positive elements outweigh the negative and that the project carries with it a significant social benefit. In addition, the project fits with international and governmental policy and legislation. Consequently, the Proposed 132 kV Oya Power Line and Substation development is supported at the social level</p>	<p>Decommission Phase</p> <p>Considering the time to decommissioning, the uncertainty of what would exactly occur over this period and the significance of the impact in isolation; it would be rather meaningless to attach assessment criteria to decommissioning at this point. Apart from this, once the project is commissioned it will become an Eskom and as such could have an extended life span.</p> <p>Cumulative</p> <table border="1"> <tr> <td>Health: ▪ Risk of HIV</td> <td>- High</td> <td>- High</td> </tr> <tr> <td>Quality of the living environment: ▪ Sense of place ▪ Service supplies and infrastructure</td> <td>- Medium</td> <td>- Medium</td> </tr> <tr> <td>Economic: ▪ Positive economic impacts</td> <td>+ Very High</td> <td>+ Very High</td> </tr> </table> <p>No-go Alternative</p> <table border="1"> <tr> <td>No project alternative</td> <td>- High</td> <td>No mitigation measures</td> </tr> </table>	Health: ▪ Risk of HIV	- High	- High	Quality of the living environment: ▪ Sense of place ▪ Service supplies and infrastructure	- Medium	- Medium	Economic: ▪ Positive economic impacts	+ Very High	+ Very High	No project alternative	- High	No mitigation measures		
Health: ▪ Risk of HIV	- High	- High														
Quality of the living environment: ▪ Sense of place ▪ Service supplies and infrastructure	- Medium	- Medium														
Economic: ▪ Positive economic impacts	+ Very High	+ Very High														
No project alternative	- High	No mitigation measures														
Terrestrial Ecology	<p>The project study area consists of natural habitat within a largely rural area. This is within an area where portions of the natural habitat have been assessed as having potential conservation value, although this project site falls outside of the NPAES entirely and are therefore not earmarked for future conservation. Currently, the rates of transformation within the vegetation in this area is low. The regional vegetation types that occur on site are listed as Least Threatened in the National List of Ecosystems that are Threatened and need of protection (GN 1002 of 2011), published under the National Environmental Management: Biodiversity Act (Act No. 10, 2004).</p>	<p>Planning and Design Phase</p> <p>The Planning / Pre-construction Phase includes any activities associated with planning of the project. This does not involve any physical disturbance of the landscape. There are therefore no impacts on biodiversity / ecology that are relevant to this phase. Nevertheless, measures taken during the Design Phase of the project can potentially have a significant effect on the nature,</p>														

Specialist	Key findings	Impacts	Impact pre mitigation	Impact post mitigation																																													
	<p>The Western Cape Biodiversity Spatial Plan, published in 2017 (Pool-Stanvliet et al. 2017) indicates that there are CBA1 areas in two parts of the powerline study area:</p> <ol style="list-style-type: none"> 1. associated with the floodplain of the Grootrivier, corresponding largely with the Tanqua Wash Riviere regional vegetation type - it is not possible to avoid this CBA1 area, although powerline Option 3 traverses this area entirely adjacent to an existing powerline. 2. in the northern side of the study area, which are mostly excluded from the direct footprint of the proposed project, with the exception of a 550 m section within a steep valley across which the powerline corridor traverses - due to the topography, it is possible that this section can be almost completely spanned with a tower structure on each side. <p>All riparian and drainage areas on site are included in Ecological Support Areas, but these have been designated as sensitive on their own merits.</p> <p>There is one (1) plant species, <i>Hoodia gordonii</i>, protected according to the National Environmental Management: Biodiversity Act, that could potentially occur on site, although none were seen during the field survey. There are a number of species protected according to the Cape Nature and Environmental Conservation Ordinance Act (Act No. 19 of 1974) that were recorded on site. None of the species listed that were found on site are of conservation concern, but the fact that they are protected means that a permit will be required for their removal. This is a standard flora permit obtained from the provincial department. Final species and numbers have been determined from a walk-through survey of the proposed infrastructure, for which details are provided in this report (in the section, "Protected Plants: Cape Nature and Environmental Conservation Ordinance 19 of 1974"), where a list of 32 species are known to occur within the footprint of the proposed infrastructure, many of these being common on site and in surrounding areas.</p> <p>There are a small number of fauna of possible conservation concern that were assessed as having a possibility of occurring on site. This includes the Vulnerable Leopard and Black-footed Cat, the near threatened Karoo Dwarf</p>	<p>extent and intensity of impacts experienced during the Construction Phase.</p> <p style="text-align: center;">Construction Phase</p> <p style="text-align: center;">Direct Impacts</p> <table border="1"> <tr> <td>Indigenous natural vegetation</td> <td>- Medium</td> <td>- Medium</td> </tr> <tr> <td>Listed or protected plant species</td> <td>- Medium</td> <td>- Low</td> </tr> <tr> <td>Faunal habitat and refugia</td> <td>- Low</td> <td>- Low</td> </tr> <tr> <td>Fauna</td> <td>- Low</td> <td>- Low</td> </tr> <tr> <td>Indigenous natural vegetation</td> <td>- Low</td> <td>- Low</td> </tr> <tr> <td>Critical Biodiversity Areas</td> <td>- Low</td> <td>- Low</td> </tr> </table> <p style="text-align: center;">Indirect Impacts</p> <table border="1"> <tr> <td>Flora and fauna</td> <td>- Low</td> <td>- Low</td> </tr> <tr> <td>Indigenous natural vegetation</td> <td>- Medium</td> <td>- Low</td> </tr> <tr> <td>Fauna</td> <td>- Low</td> <td>- Low</td> </tr> <tr> <td>Indigenous natural vegetation</td> <td>- Medium</td> <td>- Low</td> </tr> </table> <p style="text-align: center;">Operational Phase</p> <p style="text-align: center;">Direct Impacts</p> <table border="1"> <tr> <td>Indigenous natural vegetation</td> <td>- Low</td> <td>- Low</td> </tr> <tr> <td>Fauna</td> <td>- Low</td> <td>- Low</td> </tr> <tr> <td>Indigenous natural vegetation</td> <td>- Medium</td> <td>- Low</td> </tr> </table> <p style="text-align: center;">Indirect Impacts</p> <table border="1"> <tr> <td>Indigenous natural vegetation</td> <td>- Medium</td> <td>- Low</td> </tr> <tr> <td>Fauna</td> <td>- Low</td> <td>- Low</td> </tr> </table> <p style="text-align: center;">Decommissioning Phase</p>	Indigenous natural vegetation	- Medium	- Medium	Listed or protected plant species	- Medium	- Low	Faunal habitat and refugia	- Low	- Low	Fauna	- Low	- Low	Indigenous natural vegetation	- Low	- Low	Critical Biodiversity Areas	- Low	- Low	Flora and fauna	- Low	- Low	Indigenous natural vegetation	- Medium	- Low	Fauna	- Low	- Low	Indigenous natural vegetation	- Medium	- Low	Indigenous natural vegetation	- Low	- Low	Fauna	- Low	- Low	Indigenous natural vegetation	- Medium	- Low	Indigenous natural vegetation	- Medium	- Low	Fauna	- Low	- Low		
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Specialist	Key findings	Impacts	Impact pre mitigation	Impact post mitigation
	<p>Tortoise, Grey Rhebok (seen on site) and Spectacled Dormouse, and a number of protected species, including the Armadillo Girdled Lizard, the Honey Badger, the Black-footed Cat, the Leopard and the Cape Fox. The likelihood of these occurring on site varies between species, with the Grey Rhebok highly likely to occur on site, the Leopard almost certain to occur there, the Spectacled Dormouse and Karoo Dwarf Tortoise having a high probability, and the Black-footed Cat having a moderate probability of occurring there. Based on distribution, habitat requirements and other monitoring research, the Riverine Rabbit is unlikely to occur on site. Some of the species that could potentially occur on site are highly mobile species that are unlikely to be affected by any activities on site, but others are more restricted or territorial and could be more significantly affected. Of those that are more likely to be affected, if they occur there, are the Black-footed Cat, the Spectacled Dormouse, the Armadillo Girdled Lizard and the Karoo Dwarf Tortoise.</p> <p>The vegetation on site consists largely of succulent dwarf shrubland typical of the regional vegetation types. The vegetation on site is relatively uniform within regional vegetation types but varies across the geographical distance of the proposed powerline corridor. The pattern observed on site is that local diversity increases with increased elevation and with higher local surface rockiness. This means that the greatest diversity is at the highest elevations, but also located within specific habitats. Mountain summits, crests and plateau, as well as rocky outcrops, riparian habitats, and scarp valleys were identified as sensitive, either due to having higher diversity, higher value as refugia, or as being particularly sensitive to disturbance.</p> <p>For all infrastructure components, loss of habitat will occur. This will be relatively insignificant in comparison to the total area of the regional vegetation types concerned but may be more significant in terms of local patterns and diversity that could be affected. There is some variability between sites due to local conditions (microhabitats), which has a greater influence on floristic variability than any geographical gradient across the site.</p> <p>The main sensitivity on site is the presence of various watercourses in which there are dry riverbeds and associated riparian vegetation. This habitat is disproportionately important due to the functional value of these watercourses</p>	Direct Impacts		
		Indigenous natural vegetation	- Low	- Low
		Fauna	- Low	- Low
		Indigenous natural vegetation	- Medium	- Low
		Indirect Impacts		
		Fauna	- Low	- Low
		Indigenous natural vegetation	- Medium	- Low
		Fauna	- Low	- Low
		'No-Go'		
		Direct Impacts		
		Indigenous natural vegetation	- Low	- Low
		Indirect Impacts		
		None		
		Cumulative		
		Direct Impacts		
		Indigenous natural vegetation	- Medium	- Medium
		Listed or protected plant species	- Medium	- Medium
		Landscape ecological processes	- Medium	- Low
		Critical Biodiversity Areas	- Medium	- Medium
		Indirect Impacts		
Fauna	- Medium	- Medium		
Indigenous natural vegetation	- Medium	- Low		
Protected fauna	- Medium	- Medium		

Specialist	Key findings	Impacts	Impact pre mitigation	Impact post mitigation
	<p>and the important habitat and forage that they provide for animal populations. The habitat is also interconnected and any damage to one point will affect all downstream areas. For this reason, these riparian habitats, along with their floodplains, have been designated as especially sensitive. Other important habitats on site include rocky outcrops, small quartz patches, as well as some steep, south-facing slopes.</p> <p>The project involves construction of a powerline (the tower structures being the primary ground-level construction) as well as substations, and maintenance access roads for the powerline (for which some already exist along the proposed alignments). It is important to avoid local sensitivities and ensure that ecological processes are not compromised. This will ensure that impacts on site do not unnecessarily affect surrounding areas.</p> <p>A detailed assessment of potential impacts was undertaken which identified that loss of habitat is probably the most important potential impact on site. This is a typical outcome for a project proposed to be constructed within a Greenfields area. However, it is important to emphasize that the spatial scale of transformation of natural habitats on site due to the proposed project is negligible in area compared to the total area of vegetation types concerned, as well as any Critical Biodiversity Areas. The footprint of the proposed project will be relatively small due to the fact that each tower structure probably does not occupy more than a 10 x 10 m area. Assuming a total distance of close to 50 km for the powerline, and a tower structure on average every 400 m, this amounts to total area of less than 2 ha. This is in comparison to the total area of Koedoesberge-Moordenaars Karoo, for example, which occupies in the vicinity of close to five hundred (500) square kilometres, or 50 million hectares. The loss of habitat associated with this project is therefore seven orders of magnitude smaller than this and therefore regionally insignificant.</p> <p>Biodiversity patterns on site have been established to a moderate degree of confidence, including a detailed desktop assessment, two reconnaissance field surveys and a detailed walkthrough survey of the entire alignment of proposed alternatives. From this assessment, the following has been established:</p> <ol style="list-style-type: none"> 1. No threatened plant or animal species are likely to be affected by the proposed project; 			

Specialist	Key findings	Impacts	Impact pre mitigation	Impact post mitigation
	<p>2. A number of plant species protected according to Provincial legislation will be affected, but these are all common and / or widespread species, none of which are of conservation concern. The presence of these species triggers a permit requirement, but does not affect rare or threatened species;</p> <p>3. The vegetation types affected by the project are widespread and have been transformed overall to a small degree. They are therefore of low conservation concern. The amount of transformation due to the proposed project is small in absolute terms and also relative to the overall distribution of the regional vegetation;</p> <p>4. There are habitats on site that have been identified as being of higher sensitivity and value than the general vegetation, including wetland and riparian vegetation. These have all been mapped in detail and should be avoided by the project. Residual impacts on these areas of elevated sensitivity are small compared to the distribution of these on site.</p> <p>5. The only matter of concern for the site is the presence of Critical Biodiversity Areas, which occur in specific areas, and Ecological Support Areas, which coincide entirely within drainage lines and riparian areas. Mitigation measures have been proposed to minimise potential impacts on these areas.</p> <p>Conclusion At the site-specific scale, some sensitivities have been identified, primarily related to natural habitat, but also to some individual (protected) species. Many of these can be minimised or avoided with the application of appropriate mitigation or management measures, including, in some cases, avoidance of sensitive locations. There will be residual impacts, primarily on natural habitat. The amount of habitat that will be lost to the project is insignificant compared to the area in hectares of the regional vegetation type that occurs on site and over the entire geographical range of the vegetation type. In most cases, the exact locations of important biodiversity features have been identified in the field at a relatively high level of confidence.</p> <p>Impact Statement It is unlikely that the proposed project will have an unacceptable impact on the natural environment or any ecological features of concern. Based on the analysis</p>			

Specialist	Key findings	Impacts	Impact pre mitigation	Impact post mitigation
	provided in this report, the overall impact will have LOW significance, the only residual impact of medium significance being on loss of vegetation due to clearing for construction. The conclusion is that the project should be authorised. For the section from Oya to Kappa, the preferred alignment is Option 3 with Option 4 being favourable.			
Visual	<p>The study area has a largely natural, untransformed visual character with some elements of rural / pastoral infrastructure and as such, the proposed power line and substation development would alter the visual character and contrast significantly with the typical land use and/or pattern and form of human elements present across the broader study area. The level of contrast will however be reduced by the presence of the Perdekraal East WEF, Kappa substation and existing high voltage power lines located in the south-western sector of the study area.</p> <p>A broad-scale assessment of landscape sensitivity, based on the physical characteristics of the study area, economic activities and land use that predominates, determined that the area would have a low to moderate visual sensitivity. However, an important factor contributing to the visual sensitivity of an area is the presence, or absence of visual receptors that may value the aesthetic quality of the landscape and depend on it to produce revenue and create jobs.</p> <p>The area is not typically valued for its tourism significance and no formal protected areas, leisure-based tourism activities or recognised tourism routes were identified in the area. In addition, there is limited human habitation resulting in sensitive or potentially sensitive receptors in the area.</p> <p>The Visual Impact Assessment (VIA) identified twenty-three (23) potentially sensitive receptors in the study area, i.e. within 5kms from the outer boundary of the combined power line assessment corridors and substation sites. Two (2) of these receptors are considered to be sensitive receptors as they are linked to leisure/nature-based tourism activities in the area. The remaining eighteen (18) receptors are all farmsteads which are regarded as potentially sensitive visual receptors as they are located within a mostly natural setting and the proposed</p>	Planning and Design Phase		
		None		
		Construction Phase		
		Direct Impacts		
		<ul style="list-style-type: none"> Potential alteration of the visual character and sense of place Potential visual impact on receptors in the study area 	- Low	- Low
		Indirect Impacts		
		None		
		Operational Phase		
		Direct Impacts		
		<ul style="list-style-type: none"> Potential alteration of the visual character and sense of place Potential visual impact on receptors in the study area Potential visual impact on the night time visual environment 	- Low	- Low
Indirect Impacts				

Specialist	Key findings	Impacts	Impact pre mitigation	Impact post mitigation	
<p>development will likely alter natural vistas experienced from these dwellings. Five of these potentially sensitive receptor locations were however found to be outside the viewshed of the proposed development and thus are not expected to experience any visual impacts as a result of the proposed development, and therefore were removed from the assessment, resulting in only 13 potentially sensitive receptors.</p> <p>The VIA determined that the proposed development will have a high level of impact on one (1) of the sensitive receptors (Remainder of the Farm Baakens Rivier No 155). As this receptor is located on the proposed Oya Energy Facility (DEFF Ref No: 14/12/16/3/3/2/2009) development site, the owner of this farm portion has a vested interest in the proposed development and associated grid connection infrastructure and would therefore not perceive the proposed power line and substations in a negative light. The remaining sensitive receptor, which is located on the Remainder of the Farm Gats Rivier No 156, is only expected to experience moderate impacts from the proposed development, which is part of an adjacent WEF (DEFF Ref No: 14/12/16/3/3/2/2009) the owner of this farm portion has a vested interest in the proposed development and associated grid connection infrastructure and would therefore not perceive the proposed power line and substations in a negative light.</p> <p>Fifteen (15) potentially sensitive receptors will be subjected to moderate levels of visual impact as a result of the proposed power line development, while one (1) receptor will be subjected to low levels of visual impact.</p> <p>The overall impact rating revealed that the proposed development is expected to have a negative low visual impact rating during construction, operation and decommissioning phases with relatively few mitigation measures available to reduce the visual impact.</p> <p>Several renewable energy developments are being proposed within a 35 km radius of the combined power line assessment corridors and substation sites. These renewable energy developments have the potential to cause large scale visual impacts and the location of several such developments in close proximity</p>	<p>development will likely alter natural vistas experienced from these dwellings. Five of these potentially sensitive receptor locations were however found to be outside the viewshed of the proposed development and thus are not expected to experience any visual impacts as a result of the proposed development, and therefore were removed from the assessment, resulting in only 13 potentially sensitive receptors.</p> <p>The VIA determined that the proposed development will have a high level of impact on one (1) of the sensitive receptors (Remainder of the Farm Baakens Rivier No 155). As this receptor is located on the proposed Oya Energy Facility (DEFF Ref No: 14/12/16/3/3/2/2009) development site, the owner of this farm portion has a vested interest in the proposed development and associated grid connection infrastructure and would therefore not perceive the proposed power line and substations in a negative light. The remaining sensitive receptor, which is located on the Remainder of the Farm Gats Rivier No 156, is only expected to experience moderate impacts from the proposed development, which is part of an adjacent WEF (DEFF Ref No: 14/12/16/3/3/2/2009) the owner of this farm portion has a vested interest in the proposed development and associated grid connection infrastructure and would therefore not perceive the proposed power line and substations in a negative light.</p> <p>Fifteen (15) potentially sensitive receptors will be subjected to moderate levels of visual impact as a result of the proposed power line development, while one (1) receptor will be subjected to low levels of visual impact.</p> <p>The overall impact rating revealed that the proposed development is expected to have a negative low visual impact rating during construction, operation and decommissioning phases with relatively few mitigation measures available to reduce the visual impact.</p> <p>Several renewable energy developments are being proposed within a 35 km radius of the combined power line assessment corridors and substation sites. These renewable energy developments have the potential to cause large scale visual impacts and the location of several such developments in close proximity</p>	None			
		Decommissioning Phase			
		Direct Impacts			
		<ul style="list-style-type: none"> ▪ Potential visual intrusion resulting from vehicles and equipment involved in the decommissioning process ▪ Potential visual impacts of increased dust emissions from decommissioning activities and related traffic ▪ Potential visual intrusion of any remaining infrastructure on the site 	- Low	- Low	
		Indirect Impacts			
		None			
		Cumulative			
		Direct Impacts			
		<ul style="list-style-type: none"> ▪ Potential alteration of the visual character and sense of place in the broader area ▪ Potential visual impact on receptors in the study area 	- Medium	- Medium	

Specialist	Key findings	Impacts	Impact pre mitigation	Impact post mitigation
	<p>to each other could significantly alter the sense of place and visual character in the broader region. It was however determined that only six (6) of these would have any significant impact on the landscape within the study area. These facilities are Kudusberg WEF (14/12/16/3/3/1/1976/AM1) and Oya Energy Facility in the north-eastern sector of the study area and Perdekraal East WEF, Perdekraal West WEF and Tooverberg WEF in the south-west. The concentration of these facilities could potentially alter the inherent sense of place and introduce an increasingly industrial character into a largely rural area, thus giving rise to significant cumulative impacts. In light of this, cumulative impacts have been rated as negative medium during both construction and operation phases of the project. It is however anticipated that these impacts could be mitigated to acceptable levels with the implementation of the recommendations and mitigation measures stipulated for each of these developments by the visual specialists. It is important to note, however, that the study area is located within the REDZ 2, namely the Komsberg REDZ, and thus the relevant authorities support the concentration of renewable energy developments in this area.</p> <p>A comparative assessment of alternatives for the proposed on-site substation sites was undertaken in order to determine which of the alternatives would be preferred from a visual perspective. No fatal flaws were identified for any of the proposed power line corridor alternatives. Power Line Corridor Alternative 3 was identified as the Preferred Alternative, while Power Line Corridor Options 1, 2, 4 and 5 were found to be favourable.</p> <p>From a visual perspective therefore, the proposed Oya 132kV power line and associated substation project is deemed acceptable and the EA should be granted. SiVEST is of the opinion that the visual impacts associated with the construction, operation and decommissioning phases can be mitigated to acceptable levels provided the recommended mitigation measures are implemented</p>	<ul style="list-style-type: none"> ▪ Potential visual impact on the night time visual environment <p style="text-align: center;">Indirect Impacts</p> <p style="text-align: center;">None</p> <p style="text-align: center;">'No-Go'</p> <ul style="list-style-type: none"> ▪ Potential alteration of the visual character and sense of place in the broader area ▪ Potential visual impact on receptors in the study area ▪ Potential visual impact on the night time visual environment 	<p style="text-align: center;">NIL</p>	<p style="text-align: center;">- Low</p>

The specialist assessments were conducted to address the potential impacts relating to the proposed development in order to ascertain the level of each identified impact, as well as mitigation measures which may be required. The potential positive and negative impacts associated with these studies have been evaluated and rated accordingly. In addition, power line corridor routes alternatives have also been investigated and comparatively assessed (**section 8**). The results of the specialist assessments have indicated that all alternatives, including the preferred alternative, contain no fatal flaws. In addition, all applicable environmental aspects were thoroughly investigated as part of the BA process and the specialists did not recommend any further studies and/or investigations to be undertaken.

It is the opinion of the EAP that the information and data provided in this DBAR is sufficient to enable the DEFF to consider all identified potentially significant impacts and to make an informed decision on the application once the FBAR is provided. Furthermore, it is the opinion of the EAP that based on the findings of the BA and the specialist studies, that the proposed development should be granted an EA and allowed to proceed, provided the following conditions are adhered to:

- All mitigation measures recommended by the various specialists must be implemented, where applicable;
- Where applicable, monitoring should be undertaken to evaluate the success of the mitigation measures recommended by the various specialists;
- It is requested that the corridor submitted as part of this DBAR **be approved** by the DEFF; and
- The Final EMP, which accompanies this DBAR, **should be approved** by the DEFF as part of the EA.

SiVEST, as the independent EAP, is therefore of the view that:

- Feasible and practical mitigation measures have been recommended by the various specialists and have been incorporated into the Final Environmental Management Programme (EMP);
- The project location and project description can be authorised based on the findings of the suite of specialist assessments;
- A **power line corridor for the Kudusberg to Oya power line corridor route** has been identified which is environmentally acceptable and will not result in significant impacts, provided that the recommended mitigation measures are implemented and the routing of the power line within the assessed corridor avoids tower placement within the identified sensitive and “no-go” areas;
- An **acceptable power line corridor route alternative for the Oya to Kappa route (i.e. Power Line Corridor Route Alternative 4)** has been identified which is environmentally acceptable and will not result in significant impacts, provided that the recommended mitigation measures are implemented and the routing of the power line within the assessed corridor avoids tower placement within the identified sensitive and “no-go” areas;
- **Preferred on-site substations (namely the Oya on-site Eskom Substation and Kudusberg on-site Eskom Substation)** have been identified which are environmentally acceptable and will not result in significant impacts, provided that the recommended mitigation measures are implemented and the placement of the substation sites avoid the identified sensitive and “no-go” areas;
- A cumulative impact assessment of similar developments in the area was undertaken by the respective specialists. Based on their findings, majority of the cumulative impacts associated with the proposed development can be kept low after the implementation of mitigation measures, with the exception of Socio-Economic, which will be negative high even after the implementation of mitigation measures. It should however be noted that the Socio-Economic specialist also found there to be Very High positive economic impacts. In addition, some of the specialists (namely Avifauna, Terrestrial Ecology and Heritage) found that the cumulative impacts associated with the proposed development can be kept to Medium after the implementation of mitigation measures.

Despite the high cumulative impact from a Socio-Economic perspective, no fatal flaws have been identified and thus the proposed development should proceed from a cumulative impact assessment perspective; and

- Through the implementation of mitigation measures, together with adequate compliance monitoring, auditing and enforcement thereof by the appointed Environmental Control Officer (ECO) as well as the competent authority, the potential detrimental impacts associated with the proposed development can be mitigated to acceptable levels.

The date on which the activity will commence (i.e. enter construction) cannot be determined at this stage. The construction of the proposed power line and substation development is dependent on the Oya Energy Facility (DEFF Ref No.: [14/12/16/3/3/2/2009](#)) entering into a Power Purchase Agreement (PPA) with an off taker or being selected as preferred bidder under the Department of Mineral Resources' (DMRE's) Renewable Energy Independent Power Producer Procurement Programme (REIPPPP), Risk Mitigation Independent Power Producer Procurement Programme (RMIPPPP) or other government run procurement programmes. The proposed development will therefore require an EA of at least ten (10) years, and it is requested that this be taken into consideration within the EA.

It is trusted that the DBAR provides adequate information to the Interested and/or Affected Parties (I&APs) / stakeholders to provide input and for the competent authority to make an informed decision regarding the proposed development.

Way forward

The DBAR is currently being circulated for public participation for a period of 30 days¹³ (excluding public holidays) from 13 November 2020 until 14 December 2020. In light of the countrywide restriction enforced in terms of Government Gazette 43096¹⁴, which has resulted in the entire country being placed in a national state of disaster, which limits the movement and gathering of people in an effort to curb the spread CoVID-19, the public participation process has been amended and adjusted in light of these restrictions. In response, SiVEST has formulated a unique Public Participation process which is as closely related to the requirements of Regulations 39 to 44 of the EIA Regulations, 2014, as amended, (GNR 326) as possible (**Appendix 4**).

SiVEST have thus implemented a virtual and electronic public participation process, in which electronic Tablets will be located at public venues (namely the Sutherland Police Station and Witzenberg Local Municipality) in conjunction with a 'data free' website which will be set up in a way where the DBAR can be either viewed and/or downloaded free of charge. Furthermore, an electronic copy will also be made available on a website (<http://ppp.g7energies.com/K6hqwnjlf87>), whereby all registered I&APs can

¹³ DEFF have approved a 30-day Public Participation Process (Refer to **Appendix 7J** – Additional information)

¹⁴ General Notice issued by DEFF on 24 March 2020, as well as Government Notice No. 650 issued by DEFF on 05 June 2020, were being adhered to during Level 3 of national lockdown period. However, during a meeting held with SAWEA on 25 August 2020, DEFF indicated that the Directive issued by the Department on 05 June 2020 (Government Gazette 43412) relating to level 3 lockdown, has been repealed, based on the current lockdown level. Therefore, as it stands, there is no indication that a new directive will be issued, and the "normal" EIA Regulations are currently in force. DEFF however highlighted that Applicants must continue to adhere to the applicable provisions of the Disaster Management Act and associated Regulations (e.g. restrictions on gatherings for public meetings) and hence some elements included in the lockdown directive (05 June 2020 - Government Gazette 43412), mainly as it pertains to PPP, are still relevant and that this directive can be used as a consultation guide for all new applications. Applicant will thus continue to adhere to applicable provisions of Disaster Management Act and associated Regulations

download the document at no data cost to themselves (see **section 9.8**). This will ensure that all project related information associated with the BA process is readily available and accessible to any person with interest in the project, enabling the public participation process to be undertaken in line with Regulations 41 to 44 of the EIA Regulations, 2014, as amended. All I&APs and key stakeholders, such as OoS / authorities, who are registered on the project database will be notified of the submission of the DBAR and the above-mentioned, DEFF approved, 30-day public review and comment period accordingly. In addition, all OoS / authorities will be sent electronic copies (via email) of the DBAR. The 30-day public review and comment period is provided for the general public and for the I&APs and key stakeholders, as required by the EIA Regulations, 2014 (as amended). It should be noted that a Public Participation Plan (**Appendix 7J**) was compiled by the EAP and was subsequently approved by the DEFF (**Appendix 4**). All comments received will be responded to in a Comments and Response Report (C&RR), which will be included prior to submission of the FBAR to the decision-making authority, namely the DEFF. Comments received on the DBAR will be taken into consideration, incorporated into the report (where possible) and will be used when compiling the FBAR.

Once the FBAR has been submitted and the DEFF have acknowledged receipt thereof, a decision to either grant or refuse the EA for the proposed development will be made by the DEFF. In addition, once a decision regarding the EA has been received from the DEFF, all registered I&APs, stakeholders and OoS / authorities will be notified accordingly and provided details regarding the appeal process. The BA process will thus come to an end once appeals (if any) have been dealt with adequately and the appeal process closes.

All I&APs and key stakeholders will be provided with an opportunity to participate in the BA process through the public participation process which will be undertaken during the BA process.

All I&APs and key stakeholders are invited to register as I&APs in order to be kept informed throughout the process. To register as an I&AP / stakeholder and/or to obtain additional information, please submit your name, contact details (telephone number, postal address and email address) and the interest which you have in the application to SiVEST Environmental Division, as per the details below:

Contact: Hlengiwe Ntuli or Stephan Jacobs

✉ PO Box 2921, RIVONIA, 2128

☎ Phone: (011) 798 0600

✉ E-mail: hlengiwen@sivest.co.za / stephanj@sivest.co.za / sivest_ppp@sivest.co.za

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Please reference “*Oya Grid*” in your correspondence. SiVEST shall keep all registered I&APs / key stakeholders informed of the BA process.

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Glossary of Terms

Acceptability: The evaluation of the risk in comparison to certain known level of risk in other areas.

Alluvial: Resulting from the action of rivers, whereby sedimentary deposits are laid down in river channels, floodplains, lakes, depressions etc.

Archaeological resources: This includes:

- i. material remains resulting from human activity which are in a state of disuse and are in or on land and which are older than 100 years including artefacts, human and hominid remains and artificial features and structures;
- ii. rock art, being any form of painting, engraving or other graphic representation on a fixed rock surface or loose rock or stone, which was executed by human agency and which is older than 100 years, including any area within 10m of such representation;
- iii. wrecks, being any vessel or aircraft, or any part thereof, which was wrecked in South Africa, whether on land, in the internal waters, the territorial waters or in the maritime culture zone of the republic as defined in the Maritimes Zones Act, and any cargo, debris or artefacts found or associated therewith, which is older than 60 years or which SAHRA considers to be worthy of conservation;
- iv. features, structures and artefacts associated with military history which are older than 75 years and the site on which they are found.

Biodiversity: The diversity of genes, species and ecosystems, and the ecological and evolutionary processes that maintain that diversity.

Causative Events: Occurrences that give rise to hazardous incidents (e.g. failure of a temperature indicator or pressure relief, etc.).

Consequences: The physical effects of hazardous incidents and the damage caused by these effects.

Cultural landscape: A representation of the combined worlds of nature and of man illustrative of the evolution of human society and settlement over time, under the influence of the physical constraints and/or opportunities presented by their natural environment and of successive social, economic and cultural forces, both external and internal (World Heritage Committee, 1992).

Cultural Significance: This means aesthetic, architectural, historical, scientific, social, spiritual, linguistic or technological value or significance

Cumulative Impact: In relation to an activity, cumulative impact means the impact of an activity that in itself may not be significant but may become significant when added to the existing and potential impacts eventuating from similar or diverse activities or undertakings in the area.

Endemic: Restricted or exclusive to a particular geographic area and occurring nowhere else. Endemism refers to the occurrence of endemic species.

Environmental Impact Assessment: In relation to an application, to which Scoping must be applied, means the process of collecting, organising, analysing, interpreting and communicating information that is relevant to the consideration of the application.

Environmental Impact Report: In-depth assessment of impacts associated with a proposed development. This forms the second phase of an Environmental Impact Assessment and follows on from the Scoping Report.

Environmental Management Programme: A legally binding working document, which stipulates environmental and socio-economic mitigation measures which must be implemented by several responsible parties throughout the duration of the proposed project.

"Equator Principles": A financial industry benchmark for determining, assessing and managing social & environmental risk in project financing.

Fossil: Mineralised bones of animals, shellfish, plants and marine animals. A trace fossil is the track or footprint of a fossil animal that is preserved in stone or consolidated sediment.

Habitat: The area of an environment occupied by a species or group of species, due to the particular set of environmental conditions that prevail there.

Hazard: A situation that has the potential to harm people, the environment or physical property, through a fire, explosion or toxic release (e.g. the use, storage or manufacture of a flammable or toxic material).

Hazardous Incident or Event: An occurrence due to use of plant or machinery or from activities in the workplace, that leads to an exposure of persons to hazards (e.g. the rupture of a vessel and loss of containment of flammable or toxic material – also referred to as a hazardous event).

Heritage: That which is inherited and forms part of the National Estate (historical places, objects, fossils as defined by the National Heritage Resources Act 25 of 1999).

Heritage Resources: This means any place or object of cultural significance, such as the caves with archaeological deposits identified close to both development sites for this study.

Kilovolt (kV): a unit of electric potential equal to a thousand volts (a volt being the standard unit of electric potential. It is defined as the amount of electrical potential between two points on a conductor carrying a current of one ampere while one watt of power is dissipated between the two points).

Mitigate: The implementation of practical measures to reduce adverse impacts or enhance beneficial impacts of an action.

"No-Go" option: The "no-go" development alternative option assumes the site remains in its current state, i.e. there is no construction of a solar PV facility and associated infrastructure in the proposed project area.

Palaeontology: Any fossilised remains or fossil trace of animals or plants which lived in the geological past, other than fossil fuels or fossiliferous rock intended for industrial use, and any site which contains such fossilised remains or trace.

Precipitation: Any form of water, such as rain, snow, sleet, or hail that falls to the earth's surface.

PV Development Area: Area for the potential erection of PV panels within the application site

Red Data Species: All those species included in the categories of endangered, vulnerable or rare, as defined by the International Union for the Conservation of Nature and Natural Resources.

Red List: A publication that provides information on the conservation and threat status of species, based on scientific conservation assessments.

Rehabilitation: Less than full restoration of an ecosystem to its pre-disturbance condition.

Restoration: To return a site to an approximation of its condition before alteration.

Riparian: The area of land adjacent to a river or stream that is, at least periodically, influenced by flooding.

Risk: The overall probability of a particular type of consequence of a particular type of incident affecting a particular type of person.

Scenic route: A linear movement route, usually in the form of a scenic drive, but which could also be a railway, hiking trail, horse-riding trail or 4x4 trail.

Scoping Report: An “issues-based” report which forms the first phase of an Environmental Impact Assessment process.

Sense of place: The unique quality or character of a place, whether natural, rural or urban. It relates to uniqueness, distinctiveness or strong identity.

Severity: The seriousness of the consequences (e.g. death or injury or distress).

Species of Special / Conservation Concern: Species that have particular ecological, economic or cultural significance, including but not limited to threatened species.

Threatened Ecosystems: An ecosystem that has been classified as Critically Endangered, Endangered or Vulnerable, based on analysis of ecosystem threat status. A threatened ecosystem has lost, or is losing, vital aspects of its structure, composition or function. The Biodiversity Act makes provision for the Minister or Environmental Affairs, or a provincial MEC of Environmental Affairs, to publish a list of threatened ecosystems.

Threatened Species: A species that has been classified as Critically Endangered, Endangered or Vulnerable, based on a conservation assessment using a standard set of criteria developed by the IUCN for determining the likelihood of a species becoming extinct. A threatened species faces a high risk of extinction in the near future.

Visual Assessment Zone: The visual assessment zone or study area is assumed to encompass a zone of 10km from the outer boundary of the proposed application site.

List of Abbreviations

AAA	- Astronomy Advantage Area
AIA	- Approved Inspection Authority
AIA	- Archaeological Impact Assessment
AEL	- Atmospheric Emissions License
AP	- Action Plan
API	- American Petroleum Institute
APM	- Archaeology, Palaeontology and Meteorites
ATNS	- Air Traffic and Navigation Services Company Limited
AQIAr	- Air Quality Impact Assessment Report
AQMP	- Air Quality Management Plan
AQMS	- Air Quality Monitoring Station
BA	- Basic Assessment
BESS	- Battery Energy Storage System
BID	- Background Information Document
BLSA	- BirdLife South Africa
CAA	- Civil Aviation Act (Act No. 13 of 2009)
CARA	- Conservation of Agricultural Resources Act (Act No. 43 of 1983)
CBA	- Critical Biodiversity Area
CBD	- Convention on Biodiversity
CEMS	- Continuous Emissions Monitoring Systems
CO	- Carbon Monoxide
CR	- Critically Endangered
DBAR	- Draft Basic Assessment Report
DEA	- Department of Environmental Affairs
DEFF	- Department of Environment, Forestry and Fishery
DM	- District Municipality
DoE	- Department of Energy
DM	- District Municipality
DNI	- Direct Normal Irradiation
DWS	- Department of Water and Sanitation
EAP	- Environmental Assessment Practitioner
ECA	- Environmental Conservation Act (ECA) (Act No. 73 of 1989)
ECPC	- Eastern Cape Planning Commission
ECO	- Environmental Control Officer
ED	- Economic Development
EFV	- Excess Flow Valve
EHS	- Environmental, Health, and Safety
EIA	- Environmental Impact Assessment
EMPr	- Environmental Management Programme
EMI	- Electromagnetic Interference
EN	- Endangered
ENPAT	- Environmental Potential Atlas
EP	- Equator Principles
ERA	- The Electricity Regulation Act No. 4 of 2006
ERPG	- Emergency Response Planning Guideline
ESA	- Ecological Support Area
EAS	- Early Stone Ages
ESMP	- Environmental and Social Management Plan
ESMS	- Environmental and Social Management System

EX	- Extinct
FBAR	- Final Basic Assessment Report
FBGF	- Fuel-Based Generation Facility
EHS	- Environmental, Health, and Safety
GA	- General Authorisation
GDP	- Gross Domestic Product
GHG	- Green House Gases
GHI	- Global Horizontal Irradiation
GIS	- Geographic Information System
GMT	- Greenwich Meridian Time
GUMP	- Gas Utilisation Master Plan
GW	- Gigawatts
GWh	- Gigawatt Hours
HAZOP	- Hazard and Operability Study
HIA	- Heritage Impact Assessment
HPA	- Highveld Priority Area
I&AP(s)	- Interested and/or Affected Party/Parties
IBA(s)	- Important Bird Area(s)
IDP	- Integrated Development Plan
IEP	- Integrated Energy Plan
IFC	- International Finance Corporation
IKA	- Index of Kilometric Abundance
IPP(s)	- Independent Power Producers
IRP	- Integrated Resource Plan
IUCN	- International Union for the Conservation of Nature and Natural Resources
kPa	- Kilopascal
kV	- Kilo Volt
kW	- Kilowatts
LM	- Local Municipality
LED	- Local Economic Development
LSA	- Late Stone Age
m	- Metres
m ²	- Metres squared
m ³	- Metres cubed
MES	- Minimum Emission Standard
MHI	- Major Hazard Installation
MSA	- Middle Stone Age
MSL	- Mean Sea Level
MW	- Megawatt
NAAQS	- National Ambient Air Quality Standards
NAEIS	- National Atmospheric Emissions Inventory System
NDCR	- National Dust Control Regulations
NEA	- The National Energy Act (Act No. 34 of 2008)
NEMA	- National Environmental Management Act (Act No. 107 of 1998)
NEM:AQA	- National Environmental Management: Air Quality Act (Act No. 39 of 2004)
NEM:BA	- National Environmental Management: Biodiversity Act (Act No. 10 of 2004)
NEM:PAA	- National Environmental Management: Protected Areas Act (Act No. 57 of 2003)
NFA	- The National Forest Act (Act No. 84 of 1998)
NFEPA	- National Freshwater Ecosystem Priority Areas
NFPA	- National Fire Protection Association
NHRA	- National Heritage Resources Act (Act No. 25 of 1999)

NO ₂	- Nitrogen Dioxide
NO _x	- Nitrogen Oxides
NPAES	- National Parks Area Expansion Strategy
NRTA	- National Road Traffic Act (Act No. 93 of 1996)
NT	- Near Threatened
NWA	- National Water Act (Act No. 36 of 1998)
MHI	- Major Hazardous Installations
OHSA	- Occupational Health and Safety Act (Act No. 85 of 1993)
PES	- Present Ecological Status
PIA	- Palaeontological Impact Assessment
PM ₁₀	- Particulate Matter (aerodynamic diameter equal to or size less than 10µm)
PM _{2.5}	- Particulate Matter (aerodynamic diameter size equal to or less than 2.5µm)
PM	- Public Meeting
PPA	- Power Purchase Agreement
PPP	- Public Participation Process
ppm	- Parts Per Million
PV	- Photovoltaic
RA	- Risk Assessment
RDP	- Rural Development Plan
REDZ	- Renewable Energy Development Zone
REIPPPP	- Renewable Energy Independent Power Producer Procurement Programme
RE	- Renewable Energy
RMIPPPP	- Risk Mitigation Independent Power Producer Procurement Programme
SA	- South Africa
SAAQIS	- South African Air Quality Information System
SACAA	- South African Civil Aviation Authority
SAHRA	- South African Heritage Resources Agency
SAHRIS	- South African Heritage Resources Information System
SALA	- Subdivision of Agricultural Land Act (Act No. 70 of 1970)
SALT	- Southern African Large Telescope
SANBI	- South African National Biodiversity Institute
SANS	- South African National Standards
SAWEA	- South African Wind Energy Association
SDF	- Spatial Development Framework
SDS	- Safety Data Sheet
SEF	- Solar Energy Facility
SKA	- Square Kilometre Array
SO ₂	- Sulphur Dioxide
SOP	- Standard Operating Procedure
SPVs	- Special Purpose Vehicles
TL	- Terrain Loss
USEPA	- United States Environmental Protection Agency
VEGRAI	- Vegetation Response Assessment Index
VIA	- Visual Impact Assessment
VU	- Vulnerable
WEF	- Wind Energy Facility
WMA	- Water Management Area
WUL	- Water Use License
WULA	- Water Use License Application

1 INTRODUCTION

Oya Energy (Pty) Ltd (hereafter referred to as “Oya Energy”) is proposing to construct a 132kV overhead power line and 33/132kV substation near Matjiesfontein in the Western and Northern Cape Provinces (hereafter referred to as the “proposed development”) (**Figure 1**) (**DEFF Ref No.: To be Allocated**). SiVEST Environmental Division (hereafter referred to as “SiVEST”) has subsequently been appointed as the independent Environmental Assessment Practitioner (EAP) to undertake the Basic Assessment (BA) process for the above-mentioned proposed development. The overall objective of the proposed development is to feed the electricity generated by the proposed Oya Energy Facility (part of separate on-going EIA process with DEFF Ref No.: 14/12/16/3/3/2/2009) as well as potentially the nearby developments into the national grid. The grid connection and substation (this application) require a separate Environmental Authorisation (EA), in order to allow the EA to be handed over to Eskom.

It should be noted that the entire extent of the proposed 132kV overhead power line is located within one (1) of the Strategic Transmission Corridors as defined and in terms of the procedures laid out in Government Notice (GN) No. 113 of 16 February 2018, namely the Central Corridor. The proposed overhead power line and substation project irrespective of this would be subject to a BA process in terms of the National Environmental Management Act (Act 107 of 1998) (NEMA) (as amended) and Appendix 1 of the EIA Regulations, 2014, promulgated in Government Gazette 40772 and GN R326, R327, R325 and R324 on 7 April 2017.

The proposed development requires an EA from the National Department of Environment, Forestry and Fisheries (DEFF) i.e. the competent authority (CA). However, the provincial authorities (namely the Western Cape Department of Environmental Affairs and Development Planning - WC DEADP and Northern Cape Department of Environment and Nature Conservation - NC DENC), as well as CapeNature, also be consulted. The BA process for the proposed development will be conducted in terms of the EIA Regulations, 2014 (as amended) promulgated in terms of Chapter 5 of the NEMA (as amended). In terms of these regulations, and since the entire extent of the proposed development is located within one (1) of the Strategic Transmission Corridors, a BA process is required for the proposed development. All relevant legislation and guidelines (including Equator Principles) will also be consulted during the BA process and will be complied with at all times.

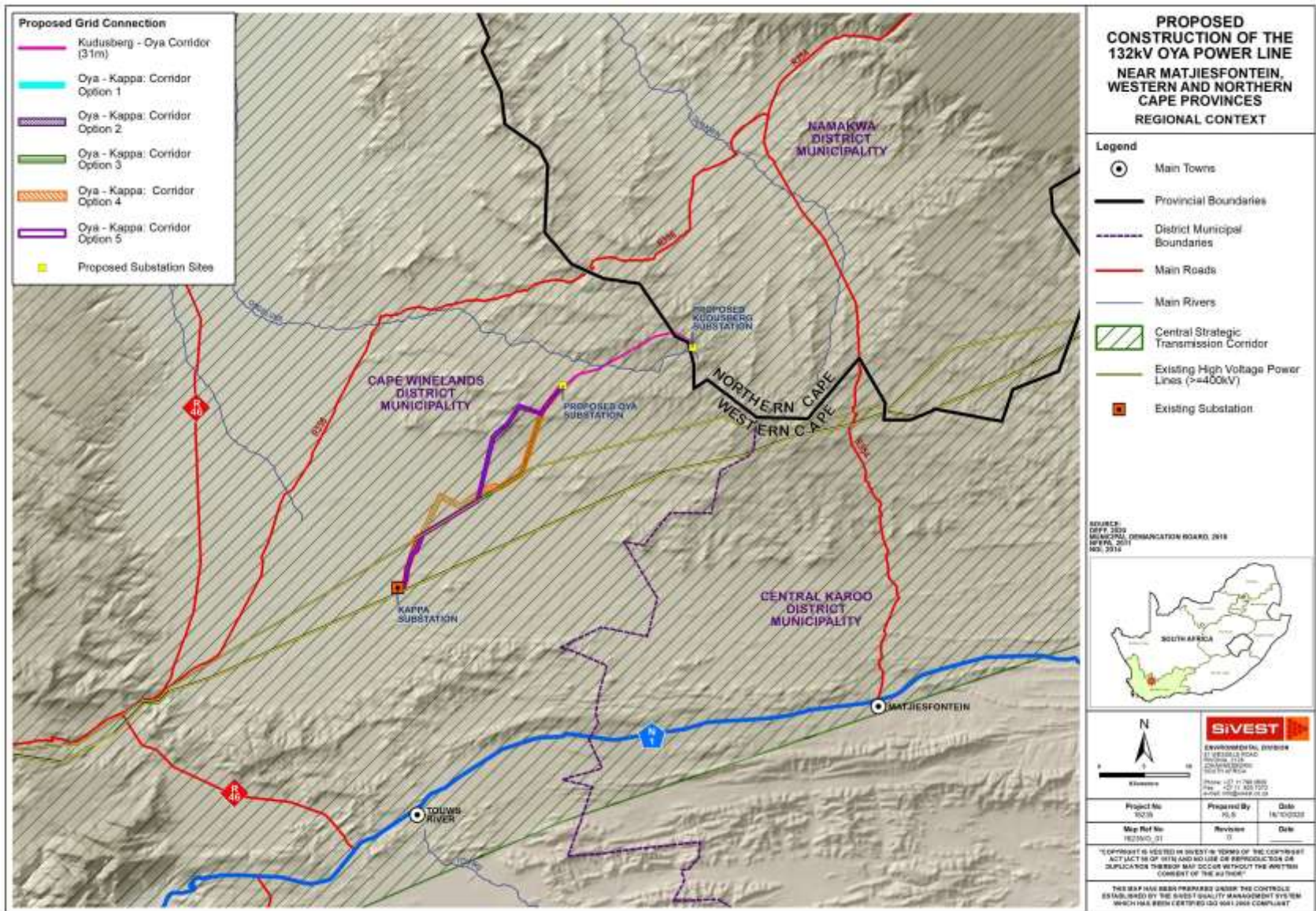


Figure 1: On-site Substations and 132kV Power Line in the regional context.

1.1 Objectives of the Basic Assessment (BA) Process

The NEMA EIA Regulations, 2014 (as amended in 2017), state that the objective of the BA process is to, through a consultative process:

- (a) determine the policy and legislative context within which the proposed activity is located and how the activity complies with and responds to the policy and legislative context;
- (b) identify the alternatives considered, including the activity, location, and technology alternatives;
- (c) describe the need and desirability of the proposed alternatives;
- (d) through the undertaking of an impact and risk assessment process, inclusive of cumulative impacts which focused on determining the geographical, physical, biological, social, economic, heritage, and cultural sensitivity of the sites and locations within sites and the risk of impact of the proposed activity and technology alternatives on these aspects to determine —
 - (i) the nature, significance, consequence, extent, duration, and probability of the impacts occurring to; and
 - (ii) 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; and
- (e) through a ranking of the site sensitivities and possible impacts the activity and technology alternatives will impose on the sites and location identified through the life of the activity to—
 - (i) identify and motivate a preferred site, activity and technology alternative;
 - (ii) identify suitable measures to avoid, manage or mitigate identified impacts; and
 - (iii) identify residual risks that need to be managed and monitored.

A Basic Assessment Report (BAR) must contain the information that is necessary for the competent authority to consider and come to a decision on the application. The content requirements for a BAR (as provided in Appendix 1 of the EIA Regulations 2014, as amended), as well as details of which section of the report fulfils these requirements, are shown in **Table 1** below.

Table 1: Content requirements for a BAR

Content Requirements	Applicable Section
(a) details of- <ol style="list-style-type: none"> (i) the EAP who prepared the report; and (ii) the expertise of the EAP, including a curriculum vitae (CV); 	Details of the EAP and full project team are included in section 1.4 . The expertise (including curriculum vitae) of the EAP and full project team are included in Appendix 2 .
(b) the location of the activity, including- <ol style="list-style-type: none"> (i) the 21-digit Surveyor General code of each cadastral land parcel; (ii) where available, the physical address and farm name; (iii) where the required information in items (i) and (ii) is not available, the coordinates of the boundary of the property or properties; 	The location (including 21-digit Surveyor General codes) of the proposed project is detailed on page iii - iv of the report (under Key Project Information), as well as in section 3.1 and section 6.2 respectively. Coordinates (start middle and end points for power line corridors and centre point coordinates for substation site) are provided on page iii - iv of the report (under Key Project Information), as well as in Appendix 9A .
(c) a plan which locates the proposed activity or activities applied for at an appropriate scale, or, if it is- <ol style="list-style-type: none"> (i) a linear activity, a description and coordinates of the corridor in which the 	A map of the regional locality is shown in section 1 and section 6.1 respectively, and the site locality is shown in section 6.2 . Additionally, all project maps are included in Appendix 5 . Coordinates are provided on

Content Requirements	Applicable Section
<p>proposed activity or activities is to be undertaken; or</p> <p>(ii) on land where the property has not been defined, the coordinates within which the activity is to be undertaken;</p>	<p>page iii - iv of the report (under Key Project Information), as well as in section 6.2. Additionally, all coordinates (start middle and end points for power line corridors and centre point coordinates for substation site) are included in Appendix 9A.</p>
<p>(d) a description of the scope of the proposed activity, including-</p> <p>(i) all listed and specified activities triggered;</p> <p>(ii) a description of the activities to be undertaken including associated structures and infrastructure;</p>	<p>The listed and specified activities triggered as per NEMA are detailed in section 4.1.3. The technical project description is included in section 3. This includes a description of activities to be undertaken, including associated structures and infrastructure.</p>
<p>(e) a description of the policy and legislative context within which the development is proposed including-</p> <p>(i) an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks, and instruments that are applicable to this activity and have been considered in the preparation of the report; and</p> <p>(ii) how the proposed activity complies with and responds to the legislation and policy context, plans, guidelines, tools frameworks, and instruments;</p>	<p>A description of all legal requirements and guidelines is provided in section 4. This includes key legal and administrative requirements as well as key development strategies and guidelines.</p>
<p>(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;</p>	<p>The need and desirability of the proposed project in the context of the preferred location is discussed in section 5.</p>
<p>(g) motivation for the preferred site, activity and technology alternative;</p>	<p>The motivation for the preferred site, activity and technology alternative of the proposed development is discussed in section 3.3 and Section 0 respectively.</p>
<p>(h) a full description of the process followed to reach the proposed preferred alternative within the site, including-</p> <p>(i) details of all the alternatives considered;</p> <p>(ii) details of the public participation process undertaken in terms of regulation 41 of the Regulations, including copies of the supporting documents and inputs;</p>	<p>A description of the alternatives considered in terms of the Regulations is included in section 3.3.</p> <p>An assessment of layout alternatives is included in section 8.</p> <p>The public participation process followed is detailed in section 9. Additionally, all public participation documents are included in Appendix 7.</p>

Content Requirements	Applicable Section
<p>(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;</p> <p>(iv) the environmental attributes associated with the alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;</p> <p>(v) the impacts and risks identified for each alternative, including the nature, significance, consequence, extent, duration and probability of the impacts, including the degree to which these impacts—</p> <p>(aa) can be reversed;</p> <p>(bb) may cause irreplaceable loss of resources; and</p> <p>(cc) can be avoided, managed or mitigated;</p> <p>(vi) the methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks associated with the alternatives;</p> <p>(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;</p> <p>(viii) the possible mitigation measures that could be applied and level of residual risk;</p> <p>(ix) the outcome of the site selection matrix;</p> <p>(x) if no alternatives, including alternative locations for the activity were investigated, the motivation for not considering such; and</p> <p>(xi) a concluding statement indicating the preferred alternatives, including preferred location of the activity;</p>	<p>This will include a summary of issues raised by I&AP's and key stakeholders, and the responses to their comments.</p> <p>A full description of the environmental attributes within the development area is included in section 6.</p> <p>The impacts, risks and mitigation associated with each alternative are assessed in section 7.2.</p> <p>The methodology used in identifying the impacts and risks associated with each alternative is included in section 7.1.</p> <p>The positive and negative impacts, along with the proposed mitigation measures related to the proposed activity will have on the environment are discussed in section 7.2 and section 7.3.</p> <p>The outcome of the site selection matrix is included in section 8.</p> <p>A concluding statement indicating the preferred alternatives is contained in section 8 and section 12.2.</p>
<p>(i) a full description of the process undertaken to identify, assess and rank the impacts the activity will impose on the preferred location through the life of the activity, including—</p> <p>(i) a description of all environmental issues and risks that were identified during the environmental impact assessment process; and</p>	<p>The process undertaken to assess the impacts as well as the assessment of impacts by each specialist are shown in section 7.1 and 7.2, respectively.</p> <p>Each environmental issue and risk is tabulated in section 7.3, and an assessment of the</p>

Content Requirements	Applicable Section
(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;	significance of each issue before and after mitigation measures is included.
(j) an assessment of each identified potentially significant impact and risk, including— (i) cumulative impacts; (ii) the nature, significance and consequences of the impact and risk; (iii) the extent and duration of the impact and risk; (iv) the probability of the impact and risk occurring; (v) the degree to which the impact and risk can be reversed; (vi) the degree to which the impact and risk may cause irreplaceable loss of resources; and (vii) the degree to which the impact and risk can be avoided, managed or mitigated;	The impact rating system contained in section 7.1.2 as well as Appendix 9C details the methodology for determining the significance of an impact. This includes the points (i) to (vii) of point (j) in Appendix 1 of the EIA Regulations, 2014 (as amended). The assessment of each potentially significant impact and risk identified by the specialists is contained in section 7.2 with impacts and recommended mitigation measures contained in section 7.3 .
(k) where applicable, a summary of the findings and impact management measures identified in any specialist report complying with Appendix 6 to these Regulations and an indication as to how these findings and recommendations have been included in the final report;	All relevant specialist findings are included in section 6 , with all recommended mitigation measures / impact management measures detailed in section 7 . The mitigation measures have been incorporated into the Final Environmental Management Programme (EMPr) which is contained in Appendix 8 . The tabulated summary of key specialist findings and recommendations is included in section 12.1 and in the Executive Summary.
(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;	The summary of key findings of the environmental impact assessment is found in section 12.1 . The high-quality maps showing the proposed activity and its associated structures and infrastructure on the environmental sensitivities of the preferred development footprint indicating any areas that should be avoided, including buffers, can be found in Appendix 5 . The summary of the positive and negative impacts and risks of the proposed activity and identified alternatives can be found in section 7.2 and section 8 respectively. Section 12

Content Requirements	Applicable Section
	details the conclusions and recommendations of the specialist assessment and the findings of the DBAR.
(m) based on the assessment, and where applicable, impact management measures from specialist reports, the recording of the proposed impact management outcomes for the development for inclusion in the EMPr;	The recommended mitigation measures from specialist reports associated with each impact are included in section 7.3 . Overall specialist recommendations and mitigation measures are also included in section 7.3 . These measures are contained in the Final EMPr which can be found in Appendix 8 .
(n) any aspects which were conditional to the findings of the assessment either by the EAP or specialist which are to be included as conditions of authorisation;	Any aspects identified by specialists or the EAP that should be included as conditions of the authorisation are identified in section 12.2 and in the Executive Summary .
(o) a description of any assumptions, uncertainties, and gaps in knowledge which relate to the assessment and mitigation measures proposed;	All assumptions and limitations are highlighted in section 2 .
(p) a reasoned opinion as to whether the proposed activity should or should not be authorised, and if the opinion is that it should be authorised, any conditions that should be made in respect of that authorisation;	A reasoned opinion as to whether the proposed activity should be authorised, and any conditions that should be made in respect of that authorisation can be found in section 12 and in the Executive Summary .
(q) where the proposed activity does not include operational aspects, the period for which the environmental authorisation is required, the date on which the activity will be concluded, and the post construction monitoring requirements finalised;	The period required for the environmental authorisation, as well as the date on which the activity and post-construction monitoring (if required) will be concluded is addressed in section 12 and in the Executive Summary .
(r) an undertaking under oath or affirmation by the EAP in relation to— (i) the correctness of the information provided in the reports; (ii) the inclusion of comments and inputs from stakeholders and I&APs; (iii) the inclusion of inputs and recommendations from the specialist reports where 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;	The EAP affirmation is included in Appendix 3 .
(s) where applicable, details of any financial provision for the rehabilitation, closure, and on-going post decommissioning management of negative environmental impacts;	Where applicable, details of any financial provisions for the rehabilitation, closure, and on-going post-decommissioning management of negative environmental impacts are included in section 11 , section 12 and the Executive Summary .

Content Requirements	Applicable Section
(t) any specific information that may be required by the competent authority; and	At this stage, there is no specific information required by the competent authority. However, a record of authority consultation is kept in section 1.3 , and should there be any specific information requested, this will be detailed in the same section.
(u) any other matters required in terms of section 24(4)(a) and (b) of the Act.	All requirements in terms of section 24(4)(a) and (b) of the Act have been met in this report.
(2) Where a government notice by the Minister provides for the basic assessment process to be followed, the requirements as indicated in such a notice will apply.	The BA process has been based on the findings of the Site Sensitivity Verification which was undertaken by the specialists. In addition, all specialist assessments which have been undertaken as part of the BA process comply with Appendix 6 of the EIA Regulations, 2014 (as amended), promulgated under sections 24(5) and 44 of the NEMA. The specialist assessments which have been undertaken are listed in section 1.2 below, and the summary of the findings are detailed in section 12.1 .

1.2 Specialist Studies

Specialist studies have been conducted in terms of the Procedures for the Assessment and Minimum Criteria for Reporting on Identified Environmental Themes in terms of Sections 24(5)(A) and (H) And 44 of the NEMA (as amended) when applying for EA, as well as the EIA Regulations, 2014 (as amended).

The following assessments were conducted to identify and assess the issues associated with the proposed development, as well as to comparatively assess all project alternatives:

- Desktop Agricultural and Soils Impact Assessment;
- Surface Water Impact Assessment;
- Avifauna Impact Assessment;
- Heritage Impact Assessment, including:¹⁵
 - Archaeology;
 - Palaeontology;
 - Cultural Landscapes;
- Socio-Economic Impact Assessment;
- Terrestrial Ecology Impact Assessment; and
- Visual Impact Assessment.

A summary of the applicable themes which identified sensitivities as per the screening tool is detailed in the table below. The online screening tool report can be found in **Appendix 9E**.

¹⁵ Archaeology, Palaeontology and Cultural Landscapes all form part the Heritage Impact Assessment (HIA). In addition, HIA has been undertaken in line with the requirements of Heritage Western Cape (HWC)

Table 2: Summary of the screening tool results and associated methodologies for specialist impact assessments

Theme	Gazetted Protocol	Protocol-Appendix 6
Desktop Agricultural and Soils Impact Assessment ¹⁶	X	
Surface Water Impact Assessment ¹⁷	X	
Avifauna Impact Assessment		X
Heritage Impact Assessment; including <ul style="list-style-type: none"> ○ Archaeology; ○ Palaeontology; and ○ Cultural Landscapes. 		X
Terrestrial Ecology Impact Assessment ¹⁸	X	
Visual Impact Assessment		X

The above-mentioned specialist assessments were also undertaken to inform the impact assessment of the proposed development. The specialists assessed the proposed substation sites and power line corridor routes (including alternatives) as part of their respective assessments and also focused on specific impacts of the proposed development area and associated infrastructure in detail. The specialist assessments also included the identification of sensitive and/or “no-go” areas. These sensitive / “no-go” areas were subsequently used to inform the area for the potential erection of the proposed substation and 132kV overhead power line. Various specialists (namely Surface Water, Avifauna, Heritage and Terrestrial Ecology) undertook detailed walkdowns of the proposed layout to identify any environmentally sensitive / “no-go” areas to be avoided in order for the corridor to be approved by the DEFF as part of this BA process.

It should be noted that the proposed layout was refined to avoid identified environmental sensitivities / “no-go” areas prior to the submission of the Application for EA and DBAR, and subsequently informed the current proposed layout, which was investigated by the respective specialists (**section 8**).

Key issues relating to the proposed site are discussed in **section 6** and **section 7**.

1.3 Decision-Making Authority Consultation

According to the Guidelines on EIAs, for facilities to be included in the National Electricity Response Plan (NERP), all Provincial environmental authorities have agreed that the DEFF is the Competent Authority for all applications from Independent Power Producers (IPPs) where they are included in the NERP. The DEFF is therefore the competent authority on this project.

¹⁶ Protocol for the specialist assessment and minimum report content requirements of environmental impacts on agricultural resources by onshore wind and/or solar photovoltaic energy generation facilities where the electricity output is 20 megawatts or more, gazetted on 20 March 2020 (Sections 24(5)(A) and (H) and 44 of NEMA, 1998).

¹⁷ Protocol for the assessment and reporting of environmental impacts on aquatic biodiversity gazetted on 20 March 2020 (Sections 24(5)(A) and (H) and 44 of NEMA, 1998)

¹⁸ Protocol for the assessment and reporting of environmental impacts on aquatic biodiversity gazetted on 20 March 2020 (Sections 24(5)(A) and (H) and 44 of NEMA, 1998)

It should be noted that a Pre-Application Meeting was requested by the EAP, however, the Department confirmed that a pre-application meeting was not deemed necessary. The request for a pre-application meeting was submitted to the DEFF on 16 October 2020. However, based on correspondence with the allocated case officer, it was confirmed that the pre-application meeting which was requested was not required. SiVEST were advised that they were required to provide the DEFF with the Public Participation Plan (to confirm the approach proposed for the Public Participation Process in light of CoVID-19 regulations) for consideration and approval only (**Appendix 4**). The Public Participation Plan was subsequently sent to the DEFF for review and approval and was approved accordingly (**Appendix 7J**).

An application for EA for the proposed development was submitted to the DEFF on Friday 13 November 2020. The proof of payment for the application fee, details of the EAP and Declaration of Independence (DoI), declaration signed by the Applicant, project schedule, details of landowners, screening tool and locality map formed part of the application form. This DBAR was submitted to the DEFF on the same day that the application for EA was submitted (namely Friday 13 November 2020). **Following the allocation of the DEFF reference number, this will be included in the FBAR.**

A record of all decision-making authority consultation is included within **Appendix 4**.

1.4 Expertise of Environmental Assessment Practitioner (EAP)

SiVEST has considerable experience in the undertaking of BAs. Staff and specialists who have worked on this proposed development and contributed to the compilation of this DBAR are detailed in **Table 3** below.

Table 3: Project Team

Name	Organisation	Role
Liandra Scott-Shaw	SiVEST	Project Coordinator / Environmental Assessment Practitioner (EAP)
Stephan Jacobs	SiVEST	Environmental Consultant
Kerry Schwartz	SiVEST	GIS, Mapping and Visual*
Hlengiwe Ntuli	SiVEST	Public Participation Consultant
Johann Lanz	-	Agriculture & Soils Specialist
Stephan van Staden	Scientific Aquatic Services (SAS)	Surface Water Specialist
Christel du Preez	FEN Consulting – part of Scientific Aquatic Services (SAS) Environmental Group of Companies	Surface Water Specialist
Chris van Rooyen	Chris van Rooyen Consulting	Avifauna (Birds) Specialist
Albert Froneman	Chris van Rooyen Consulting	Avifauna (Birds) Specialist
Jenna Lavin	CTS Heritage	Heritage Specialist
Nicholas Wiltshire	CTS Heritage	Heritage Specialist
Neville Bews	Dr Neville Bews & Associates	Socio-Economic Specialist
David Hoare	David Hoare Consulting	Terrestrial Ecology Specialist

**Specialist assessments undertaken by SiVEST's in-house specialist. Based on correspondence with the DEFF, it was confirmed that assessments undertaken by in-house specialists do not need to be externally reviewed as a specialist permanently employed by an EAP is regarded as independent, provided he / she has no vested interest in the project and receives fair and normal remuneration for the work. An external peer review will be required should the Competent Authority have reason to believe that the EAP or specialist is not complying or has not*

complied with the requirements of Regulation 13 of the EIA regulations (as amended). In addition, all specialists are required to sign a Declaration of Independence (DoI). It should be noted that the respective in-house specialist is deemed to be independent, has no vested interest in the project and receives fair and normal remuneration for the work, as confirmed as part of the signed specialist DoI, all of which have been submitted with this DBAR (**Appendix 3**). Refer to **Appendix 9D** for proof of this correspondence with the DEFF.

As per the requirements of the NEMA 2014, (as amended), the details and level of expertise of the persons who prepared the DBAR are provided in **Table 4** below. The EAP Affirmation and Declaration of Independence (DoI) is contained in **Appendix 3**.

Table 4: Expertise of the EAP

Lead Project Coordinator / Environmental Assessment Practitioner (EAP)	SiVEST SA (Pty) Ltd – Liandra Scott-Shaw
Contact Details	liandras@sivest.co.za
Qualifications	B.Sc. Biological Science and B.Sc. (Hons) Ecological Science
Professional Affiliations	SACNASP: 117442 IAIAsa Membership Number: 3624
Expertise	Liandra has approximately 8 years work experience specialising in undertaking and managing Environmental Impact Assessments (EIAs) and Basic Assessment (BAs), primarily related to energy generation and electrical distribution projects as well as Vegetation Ecology and Environmental Management. She has extensive experience in overseeing public participation and stakeholder engagement processes and has been involved in environmental baseline assessments, fatal flaw / feasibility assessments and environmental sensitivity analyses. She is responsible for the overall management of the SiVEST renewable energy projects and project management.
Environmental Consultant	SiVEST SA (Pty) Ltd - Stephan Jacobs
Contact Details	stephanj@sivest.co.za
Qualifications	B.Sc. Environmental Sciences (undergraduate) and B.Sc. (Hons) Environmental Management and Analysis
Professional Affiliations	IAIAsa Membership Number: 5736
Expertise	Stephan specialises in the field of Environmental Management and has been extensively involved in Environmental Impact Assessment (EIA) and Basic Assessment (BA) processes for various types of projects / developments, in particular renewable energy projects. Stephan has extensive experience in undertaking public participation and stakeholder engagement processes. Stephan has also assisted extensively in the undertaking of field work and the compilation of reports for specialist studies such as Surface Water and Visual Impact Assessments. Stephan also has considerable experience in Environmental Compliance and Auditing and has acted as an Environmental Control Officer (ECO) for several infrastructure projects.

Please refer to attached CV's in **Appendix 2** for more information. Dols for each respective specialist are contained in **Appendix 3**.

1.5 Draft Basic Assessment Report (DBAR) Structure

This DBAR is structured as follows:

- **Chapter 1** introduces the proposed development and explains the objectives of the BA process. It also provides a background to the proposed development and the environmental impact process. The chapter also points out the specialist studies for the proposed development and describes the authority consultation thus far. Furthermore, the chapter discusses the experience of the EAP as well as specialists who have contributed to the report;
- **Chapter 2** elaborates on the assumptions and limitations pertaining to the BA process for the proposed development;
- **Chapter 3** presents the technical description of the proposed development, including a description of alternatives being considered;
- **Chapter 4** expands on the relevant legal ramifications applicable to the proposed development and describes relevant development strategies and guidelines;
- **Chapter 5** provides explanation to the need and desirability of the proposed development;
- **Chapter 6** provides a description of the region in which the proposed development is intended to be located. Although the chapter provides a broad overview of the region, it is also specific to the application. It contains descriptions of the site and the specialist studies conducted are also summarised;
- **Chapter 7** identifies potential impacts associated with the proposed development. The chapter further identifies these impacts per specialist study and discusses potential cumulative impacts per environmental issue (i.e. per specialist study). In addition, a rating of each environmental issue before and after the implementation of mitigation measures is also presented;
- **Chapter 8** discusses layout alternatives, including how they relate to sensitive areas identified by specialists and provides a comparison of alternatives;
- **Chapter 9** describes the Public Participation Process (PPP) undertaken during the BA process and tables issues and concerns raised by Interested and/or Affected Parties (I&APs) and key stakeholders;
- **Chapter 10** Provides a description of the environmental monitoring and auditing process to be undertaken for the proposed development;
- **Chapter 11** provides an assessment of the report in terms of the World Bank Standards and Equator Principles. This chapter presents a checklist that ensures that the report has been compiled according to the requirements of the World Bank Standards and Equator Principles;
- **Chapter 12** summarises the findings and recommendations per specialist study and provides the overall conclusion;
- **Chapter 13** outlines the processes to be followed, following the submission of the DBAR; and
- **Chapter 14** lists references indicated in the DBAR.

2 ASSUMPTIONS AND LIMITATIONS

2.1 General Assumptions and Limitations

- It is assumed that all information provided to the Environmental Team by the applicant was correct and valid at the time it was provided;
- It is not always possible to involve all I&APs individually, however, every effort has been / is being made to involve as many interested parties as possible. It is also assumed that individuals representing various associations or parties convey the necessary information to these associations / parties;
- It is assumed that the information provided by the various specialists is unbiased and accurate;

- It is not possible to determine the actual degree of the impact that the proposed development will have on the immediate environment without some level of uncertainties. Actual impacts can only be determined following the commencement of construction and/or operation. However, all assessments were undertaken by a skilled and experienced team to the best of their ability; and
- SiVEST undertook every effort to obtain the information (including specialist studies, BA / EIA / Scoping and EMPr Reports) for the surrounding developments. However, many of the documents are not currently publicly available to download. The information that could be obtained for the surrounding planned renewable energy developments was taken into account as part of the cumulative impact assessment.
- Note that this is a winter rainfall area with maximum vegetation growth taking place in late winter to spring, which means that the survey was conducted at the correct time of the year for assessing the site.

2.2 Specialist Assumptions and Limitations

The following assumptions, uncertainties and gaps in knowledge were encountered by the various specialists:

2.2.1 Terrestrial Ecology

The following assumptions, limitations, uncertainties are listed regarding the Terrestrial Ecology Impact Assessment for the proposed development:

- Red List species are, by their nature, usually very rare and difficult to locate. Compiling the list of species that could potentially occur in an area is limited by the paucity of collection records that make it difficult to predict whether a species may occur in an area or not. The methodology used in this assessment is designed to reduce the risks of omitting any species, but it is always possible that a species that does not occur on a list may be unexpectedly located in an area.

2.2.2 Agricultural and Soils

The following assumptions, limitations, uncertainties are listed regarding the Agricultural and Soil Compliance Statement for the proposed development:

- The study makes the assumption that water for irrigation is not available in the study area. This is based on the assumption that a long history of farming experience in an area will result in the exploitation of viable water sources if they exist, and none have been exploited in the study area.
- There are no other specific assumptions, uncertainties or gaps in knowledge or data that affect the findings of this study.

2.2.3 Surface Water

The following assumptions, limitations, uncertainties are listed regarding the Surface Water Impact Assessment for the proposed development:

- The ground-truthing and delineation of the watercourse boundaries and the assessment thereof are confined to a single site visit undertaken on the 22nd to the 24th of October 2020 (Western Cape late spring season) of the proposed development. All watercourses identified within the

investigation area were delineated in fulfilment of Government Notice 509 of 2016 as it relates to the National Water Act, 1998 (Act No. 36 of 1998) using various desktop methods including the use of topographic maps, historical and current digital satellite imagery and aerial photographs;

- This scope of work is limited to assessing the watercourses associated with the proposed development only, and does not include assessing watercourses potentially impacted by the construction and development of substations or any other surface infrastructure associated with the Oya Energy development (14/12/16/3/3/2/2009);
- At the time of this assessment, the positions for the pylons supporting the proposed development was not available as the outcome of this assessment will guide the placement of these structures. It is also assumed that maintenance roads will be required as part of the proposed development, however, no details pertaining to new roads were provided by the proponent as part of this assessment;
- Due to the landscape in some areas being rugged and very undeveloped, some reaches of the identified watercourses were inaccessible. Therefore, verification points for watercourses were located at points as close to the watercourse to be verified as possible and where necessary the conditions at the exact point required were inferred or extrapolated;
- Due to the majority of watercourses being ephemeral within the region, very few areas were encountered that displayed more than one watercourse characteristic as defined by the DWAF (2008) method (such as containing alluvial or inundated soils, or hosts riparian vegetation adapted to saturated conditions). As a result, identification of the outer boundary of the temporary watercourse zones and marginal riparian zones proved difficult in some areas and, in particular, in the areas where watercourse conditions and riparian zones are marginal, and therefore delineations were augmented with the use of digital satellite imagery. Nevertheless, the watercourse delineations as presented in this report are regarded as a best estimate of the watercourse boundaries based on the site conditions present at the time of assessment and the results obtained are, however, considered sufficiently accurate to allow informed planning and decision making to take place;
- Global Positioning System (GPS) technology is inherently somewhat inaccurate and some inaccuracies due to the use of handheld GPS instrumentation may occur. However, the delineations as provided in this report are deemed accurate enough to fulfil the environmental authorisation requirements as well as the implementation of the mitigation measures provided;
- Watercourses and terrestrial zones create transitional areas where an ecotone is formed as vegetation species change from terrestrial to obligate/facultative species. Within this transition zone, some variation of opinion on the watercourse boundaries may occur. However, if the DWAF (2008) method is followed, all assessors should get largely similar results; and
- With ecology being dynamic and complex, certain aspects (some of which may be important) may have been overlooked. However, it is expected that the watercourses have been accurately assessed and considered, based on the field observations and the consideration of existing studies and monitoring data in terms of riparian and wetland ecology.

2.2.4 Avifauna

This study assumed that the sources of information used in this report are reliable. In this respect, the following must be noted:

- A total of 58 South African Bird Atlas Project (SABAP) 2 full protocol lists had been completed for the broader area where the proposed project is located (i.e. bird listing surveys lasting a minimum of two hours each). In addition, 95 ad hoc protocol lists (i.e. bird listing surveys lasting less than two hours but still giving useful data) were also recorded. The SABAP2 data was therefore regarded as an adequate indicator of the avifauna which could occur at the proposed

development area, and it was further supplemented by data collected during the on-site surveys and previous surveys.

- The focus of the study was primarily on the potential impacts of the proposed OHL on priority species. Priority species were defined as species which could potentially be impacted by power line collisions or electrocutions, based on specific morphological and/or behavioural characteristics. Priority species were further subdivided into raptors, waterbirds, terrestrial birds and corvids.
- The assessment of impacts is based on the baseline environment as it existed at the time of the field investigations.
- Cumulative impacts include all proposed and existing renewable energy projects within a 35km radius around the proposed development areas.
- Conclusions drawn in this study are based on experience of the specialist on the species found on site and similar species in different parts of South Africa. However, bird behaviour can never be entirely reduced to formulas that will be valid under all circumstances.
- The broader area was defined as the area encompassed by the 9 pentads where the project is located (see Figure 2 of Avifauna Impact Assessment Report). The study area was defined as the area covered by a 2km buffer around the proposed alignments options.

2.2.5 Heritage (including Archaeology, Palaeontology and Cultural Landscapes)

The following assumptions and uncertainties are listed regarding the HIA (including Archaeology, Palaeontology and Cultural Landscapes) for the proposed development:

- The significance of the sites and artefacts is determined by means of their historical, social, aesthetic, technological and scientific value in relation to their uniqueness, condition of preservation and research potential. It must be kept in mind that the various aspects are not mutually exclusive, and that the evaluation of any site is done with reference to any number of these.
- It should be noted that archaeological and palaeontological deposits often occur below ground level. Should artefacts or skeletal material be revealed at the site during construction, such activities should be halted, and it would be required that the heritage consultants are notified for an investigation and evaluation of the find(s) to take place.

However, despite this, sufficient time and expertise was allocated to provide an accurate assessment of the heritage sensitivity of the area.

- Based on the palaeontological record and the geology of the area it is assumed that the area contains plant, invertebrate and vertebrate fossils, trace fossils should also be common. These fossils are often found as individual specimens.
- *“The key assumption for this scoping study is that the existing geological maps and datasets used to assess site sensitivity are correct and reliable. However, the geological maps used were not intended for fine scale planning work and are largely based on aerial photographs alone, without ground-truthing. There is also an inadequate database for fossil heritage for much of the RSA, due to the small number of professional palaeontologist carrying out fieldwork in RSA. Most development study areas have never been surveyed by a palaeontologist.*
- *These factors may have a major influence on the assessment of the fossil heritage significance of a given development and without supporting field assessments may lead to either:*
 - *an underestimation of the palaeontological significance of a given study area due to ignorance of significant recorded or unrecorded fossils preserved there, or*
 - *an overestimation of the palaeontological sensitivity of a study area, for example when originally rich fossil assemblages inferred from geological maps have in fact been destroyed*

by weathering, or are buried beneath a thick mantle of unfossiliferous “drift” (soil, alluvium etc.).” Groenewald (2016).

The following constraints and limitations are listed regarding the HIA (including Archaeology, Palaeontology and Cultural Landscapes) for the proposed development:

- A portion of the area proposed for development was not easily accessible, due to restricted road access. As a result, the entirety of the proposed development area was not able to be surveyed but sampling was implemented and approximately 25km of the area was surveyed by foot.
- The experience of the archaeologist, and observations made during the study as well as previous studies, allow us to predict with some accuracy the archaeological sensitivity of the receiving environment.

2.2.6 Socio-Economic

The following assumptions, limitations, uncertainties are listed regarding the Socio-Economic Impact Assessment of the proposed development:

- It is assumed that the technical information provided by the project proponent, Oya Energy (Pty) Ltd and the environmental consultants, SiVEST SA (Pty) Ltd, was credible and accurate at the time of compiling the report. It is also assumed that the data provided by the various specialists as used in this report are credible and accurate.
- The demographic data used in this report was sourced from Statistics South Africa and is based on data gathered during Census 2011 and Community Survey, 2016. This data is somewhat outdated but where possible is supplemented with the latest Stats SA’s survey data such as the Mid-year population estimates and the Quarterly Labour Force Survey. The limitation of this is that this survey data is restricted to a provincial level and does not extend to a municipal level.
- It was also agreed with the project proponent and environmental consultant that contact with landowners would be treated with sensitivity. This, to retain the positive rapport that the project proponent, Oya Energy (Pty) Ltd, had painstakingly established with landowners, and to ensure that the information provided to landowners was of an accurate and consistent nature. No site visit was undertaken as the region was sparsely populated and where necessary information could be obtained from the environmental consultants. Apart from this, the study was undertaken during Stage 3 of the State of National Disaster declared in South Africa as a result of the COVID-19 pandemic. Accordingly, the need for social distancing and limiting unnecessary interpersonal contact and travel was respected throughout this study.

2.2.7 Visual

The following assumptions, limitations, uncertainties are listed regarding the Visual Impact Assessment (VIA) for the proposed development:

- Substations and power lines are very large structures by nature and could impact on receptors that are located relatively far away, particularly in areas of very flat terrain. Given the nature of the receiving environment and the height of the various components of the proposed development, the study area or visual assessment zone is assumed to encompass a zone of 5km from the outer boundary of the combined power line assessment corridors and substation sites. This 5km limit on the visual assessment zone relates to the importance of distance when assessing visual impacts. Although the proposed development may still be visible beyond 5km, the degree of visual impact would diminish considerably and as such the need to assess the impact on potential receptor locations beyond this distance would not be warranted.

- As previously stated, information pertaining to visual receptors is largely drawn from recent visual assessments conducted in the general vicinity of the proposed development. These studies include VIAs for the proposed Kudusberg WEF (SiVEST, 2019), Tooverberg WEF and grid connection infrastructure (SiVEST, 2019) and Oya Energy Facility (SiVEST, 2020). Receptors identification for all of these studies involved a combination of desktop assessment as well as field-based observations. Initially Google Earth imagery was used to identify potential receptors within the study area and where possible, these receptor locations were verified and assessed during site visits undertaken in July / August 2018 and in July 2020.
- Due to the extent of the respective study areas for previous VIA projects and the nature of the terrain, it was not possible to visit or verify every potentially sensitive visual receptor location. As such, several broad assumptions have been made in terms of the likely sensitivity of the receptors to the proposed development. It should be noted that not all receptor locations would necessarily perceive the proposed development in a negative way. This is usually dependent on the use of the facility, the economic dependency of the occupants on the scenic quality of views from the facility and on people's perceptions of the value of "Green Energy". Sensitive receptor locations typically include sites such as tourism facilities and scenic locations within natural settings which are likely to be adversely affected by the visual intrusion of the proposed development. Thus, the presence of a receptor in an area potentially affected by the proposed development does not necessarily mean that any visual impact will be experienced.
- For the purposes of the VIA, all analysis is based on a worst-case scenario where power line tower and substation structure heights are assumed to be 45m.
- Due to the varying scales and sources of information; maps may have minor inaccuracies. Terrain data for the study area derived from the National Geo-Spatial Information (NGI)'s 25m DEM is fairly coarse and somewhat inconsistent and as such, localised topographic variations in the landscape may not be reflected on the Digital Elevation Model (DEM) used to generate the viewsheds.
- In addition, the viewsheds produced do not take into account any existing vegetation cover or built infrastructure which may screen views of the proposed development and as such should be seen as a conceptual representation or a worst-case scenario.
- The potential visual impact at each visual receptor location was assessed using a matrix developed for this purpose. The matrix is based on three main parameters relating to visual impact and, although relatively simplistic, it provides a reasonably accurate indicative assessment of the degree of visual impact likely to be experienced at each receptor location as a result of the proposed development. It is however important to note the limitations of quantitatively assessing a largely subjective or qualitative type of impact and as such the matrix should be seen merely as a representation of the likely visual impact at a receptor location.
- No feedback regarding the visual environment has been received from the public participation process to date. Any feedback from the public during the review period of the Draft Basic Assessment Report (DBAR) will however be incorporated into further drafts of this report, if relevant.
- It is assumed that operational and security lighting will be required for the substation proposed within the Oya Energy Facility (14/12/16/3/3/2/2009) development footprint. At the time of undertaking the visual study no information was available regarding the type and intensity of lighting required and therefore the potential impact of lighting at night has not been assessed at a detailed level. Accordingly, general measures to mitigate the impact of additional light sources on the ambiance of the nightscape have been provided.
- This study includes an assessment of the potential cumulative impacts of other renewable energy developments on the existing landscape character and on the identified sensitive receptors. This assessment is based on the information available at the time of writing the report and where information has not been available, broad assumptions have been made as to the likely impacts of these developments.

- SiVEST made every effort to obtain information for the surrounding planned renewable energy developments (including specialist studies, assessment reports and Environmental Management Programmes). However, some of the documents are not currently publicly available for download. The available information was factored into the cumulative impact assessment (section 8.4 of VIA Report – **Appendix 6G**).
- No visualisation modelling was undertaken for the proposed development as this is not normally required for linear infrastructure. This can however be provided should the Public Participation process identify the need for this exercise.
- It should be noted that all the site visits were undertaken during the winter months of July or August. The study area is however typically characterised by low levels of rainfall all year round and therefore the season is not expected to affect the significance of the visual impact of the proposed development.
- Clear weather conditions tend to prevail throughout most of the year in this area, and in these clear conditions, power lines and associated infrastructure would present a greater contrast with the surrounding landscape than they would on a cloudy overcast day. Both clear and cloudy weather conditions were experienced during the different site visits and these factors were taken into consideration when undertaking this VIA.

3 TECHNICAL DESCRIPTION

The proposed development will include the following components:

- Two (2) new 33/132kV on-site substations (namely the Oya on-site Eskom Substation¹⁹ and Kudusberg on-site Eskom Substation²⁰) to serve the Oya Energy Facility (part of separate on-going EIA process with **DEFF Ref No.:** 14/12/16/3/3/2/2009) and Kudusberg WEF (authorised under 14/12/16/3/3/1/1976/AM1), occupying an area of up to approximately 4 hectares (ha) each (refer to **section 3.2.1**); and
- A new 132kV overhead power line connecting the Kudusberg substation (authorised under 14/12/16/3/3/1/1976/AM1²⁰) to the Oya substation and finally the Kappa Substation, from where the electricity will be fed into the national grid.

Please refer to the **section 3.2** of the DBAR for all technical details regarding the proposed development. All relevant project technical details are summarised in **Table 6**.

It should be noted that the proposed layout has been informed by the environmental sensitive and “no-go” areas which were identified by the respective specialists. Various specialists (namely Surface Water, Avifauna, Heritage and Terrestrial Ecology) undertook detailed walkdowns of the proposed layout to identify environmentally sensitive / “no-go” areas to be avoided in order for the final layout to be approved by the DEFF. The proposed layout was refined to avoid environmental sensitivities / “no-go” areas prior to the submission of the Application for EA and DBAR.

The specialists assessed the proposed substation sites and power line corridors (including alternatives) as part of the BA process. Five (5) power line corridor route alternatives for the section of the proposed

¹⁹ Substation includes Eskom portion and IPP portion. Substation also forms part of Oya Energy Facility (separate on-going EIA process with DEFF Ref No.: 14/12/16/3/3/2/2009). Substation thus included in Oya Energy Facility EIA and in grid infrastructure BA (this application) to allow for handover to Eskom

²⁰ Substation authorised as part of Kudusberg WEF (14/12/16/3/3/1/1976/AM1). Substation includes Eskom portion and IPP portion. Oya Energy now applying to have 33kV yard portion of substation authorised as part of this grid infrastructure BA application. Substation thus included in grid infrastructure BA (this application) to allow for handover to Eskom

power line which connects the Oya Energy Facility substation to the Kappa substation (i.e. Oya to Kappa route) were identified and comparatively assessed by the respective specialists. No site alternatives were considered for the proposed substation sites as the placement of the substations were determined during the EIA process for the proposed Oya Energy Facility as well as the BA process for the authorised Kudusberg WEF. The identified sensitive and/or “no-go” areas which were identified have informed the assessment of alternatives and substation sites.

The layout alternatives and results of the comparative assessment of alternatives have been discussed in more detail in **section 8**.

3.1 Project Location

The proposed facility is located approximately 50km north-west of the town of Matjiesfontein, within the Witzenberg and Karoo Hoogland Local Municipalities, in the Cape Winelands and Namakwa District Municipalities of the Western and Northern Cape Provinces.

The development area assessed by the specialists incorporated twenty-one (21) farm portions within the Witzenberg and Karoo Hoogland Local Municipalities, in the Cape Winelands and Namakwa District Municipalities respectively. However, only twelve (12) farm portions are affected by the substations, Kudusberg to Oya power line corridor route, as well as the preferred Oya to Kappa power line corridor route (namely Power Line Corridor Alternative 4). These include the following [including 21-digit Surveyor General (SG) codes]:

- Remainder of the Farm Baakens Rivier No 155: C01900000000015500000
- Portion 1 of the Farm Gats Rivier No 156: C01900000000015600001
- Remainder of the Farm Gats Rivier No 156: C01900000000015600000
- Portion 1 of the Farm Amandelboom No 158: C01900000000015800001
- Remainder of the Farm Oliviers Berg No 159: C01900000000015900000
- Portion 4 of the Farm Bantamsfontein No 168: C01900000000016800004
- Portion 13 of the Farm Bantamsfontein No 168: C01900000000016800013
- Remainder of the Farm Lower Roodewal No 169: C01900000000016900000
- Remainder of the Farm Matjes Fontein No 194: C07200000000019400000
- The Farm Platfontein No 240: C01900000000024000000
- The Farm Die Brak No 241: C01900000000024100000
- Remainder of the Farm Rietpoort No 243: C01900000000024300000

Table 5: Summary of coordinates for substation sites and power line corridors

OYA GRID: KUDUSBERG TO OYA POWER LINE CORRIDOR ROUTE²¹				
CENTRE LINE COORDINATES (DD MM SS.sss)				
CORRIDOR	START POINT (KUDUSBERG SUB)	MIDDLE POINT	END POINT (OYA SUB)	APPROX LENGTH (KM)
Kudusberg to Oya	S32° 52' 6.431"	S32° 52' 22.996"	S32° 54' 24.448"	16.6
	E20° 21' 1.032"	E20° 17' 13.070"	E20° 12' 28.565"	

²¹ Only one (1) route possible for section of proposed power line which connects Kudusberg substation to Oya substation (i.e. Kudusberg to Oya route). No alternatives can therefore be provided for this section of proposed power line

OYA GRID: PREFERRED POWER LINE CORRIDOR ROUTE ALTERNATIVE (OYA TO KAPPA) ²²				
CENTRE LINE COORDINATES (DD MM SS.sss)				
CORRIDOR ALTERNATIVE	START POINT (OYA SUB)	MIDDLE POINT	END POINT (KAPPA SUB)	APPROX LENGTH (KM)
Alternative 4 (Oya to Kappa)	S32° 54' 24.448"	S33° 0' 51.986"	S33° 6' 29.185"	32.94
	E20° 12' 28.565"	E20° 6' 19.061"	E20° 0' 40.626"	
OYA GRID: SUBSTATION SITE COORDINATES				
SUBSTATION	AREA (HECTARES)	CENTRE POINT COORDINATES		
		SOUTH	EAST	
33/132kV Oya Substation ¹⁹	4	S32° 54' 24.448"	E20° 12' 28.565"	
33/132kV Kodusberg Substation ²⁰	4	S32° 52' 9.50"	E20° 21' 47.01"	

The proposed layout has been informed by sensitive and/or “no-go” areas identified during the BA process of the proposed development.

The proposed development location is shown in the locality map (**Figure 2**) below.

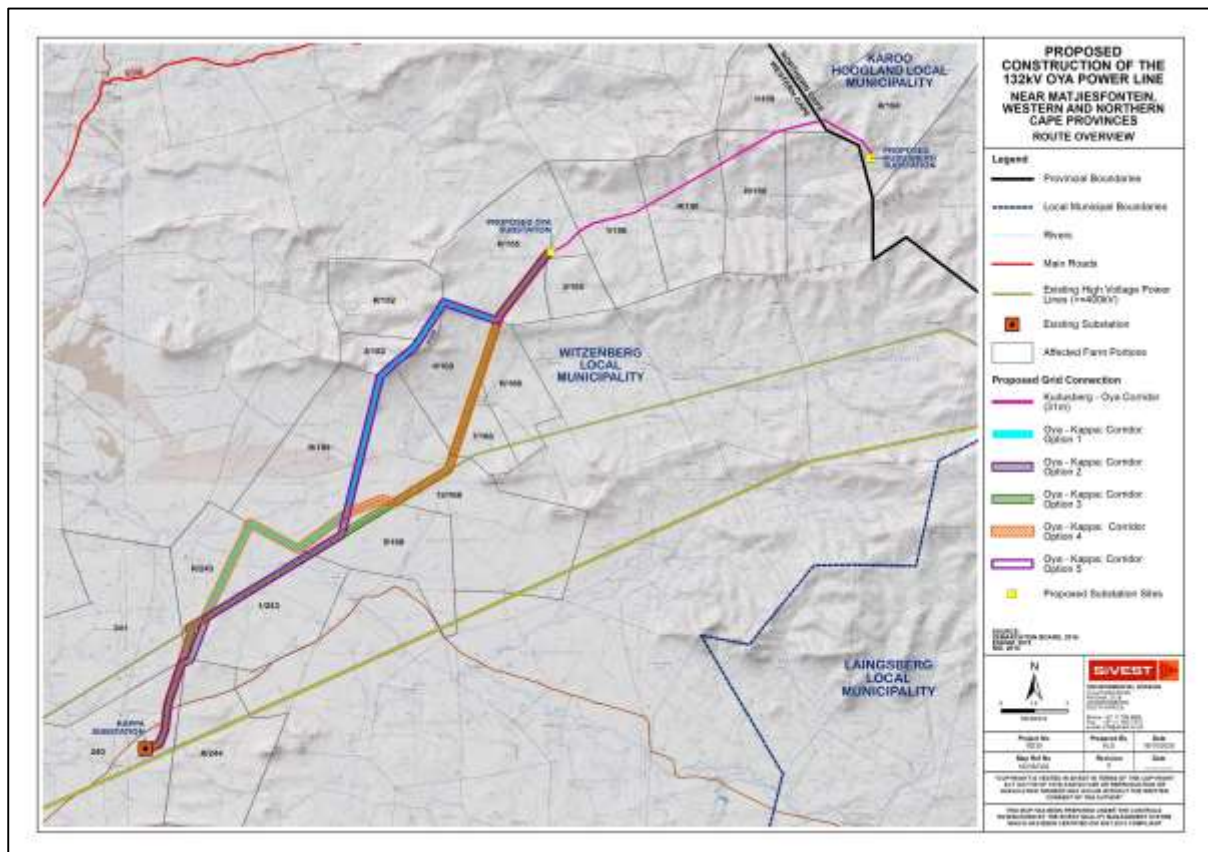


Figure 2: Layout map showing substation sites and power line corridors (including alternatives)

²² Five (5) power line corridor route alternatives provided for section of proposed power line which connects Oya substation to Kappa substation (i.e. Oya to Kappa route)

3.2 Technical Details

As mentioned, Oya Energy is proposing the construction of two (2) substations (namely the Oya on-site Eskom Substation¹⁹ and Kudusberg on-site Eskom Substation²⁰) and associated 132kV overhead power line in order to feed the electricity generated by the proposed Oya Energy Facility (part of separate on-going EIA process with DEFF Ref No.: 14/12/16/3/3/2/2009) as well as potentially the nearby developments into the national grid.

The key technical details and infrastructure required are presented in the table below (**Table 6**).

Table 6: Summary of key components

PROJECT	DEFF REFERENCE	FARM NAMES AND AREA
Oya 132kV Power Line	<u>To be Allocated</u>	<p><u>Oya Substation</u></p> <ul style="list-style-type: none"> ▪ Remainder of the Farm Baakens Rivier No 155 <p><u>Kudusberg Substation:</u></p> <ul style="list-style-type: none"> ▪ Remainder of the Farm Matjes Fontein No 194 <p>Area of Oya and Kudusberg substation and O&M building sites (combined) = 8ha (namely 4ha each)</p> <p><u>Kudusberg to Oya Power Line Corridor:</u></p> <ul style="list-style-type: none"> ▪ Remainder of the Farm Matjes Fontein No 194; ▪ Portion 1 of the Farm Amandelboom No 158 ▪ Remainder of the Farm Oliviers Berg No 159 ▪ Remainder of the Farm Gats Rivier No 156 ▪ Portion 1 of the Farm Gats Rivier No 156 ▪ Remainder of the Farm Baakens Rivier No 155 <p>Kudusberg to Oya Power Line Corridor = Approx. 16.6km in length</p> <p><u>Preferred Oya to Kappa Power Line Corridor (Alternative 4):</u></p> <ul style="list-style-type: none"> ▪ Remainder of the Farm Baakens Rivier No. 155 ▪ Portion 4 of the Farm Bantamsfontein No. 168 ▪ Portion 13 of the Farm Bantamsfontein No. 168 ▪ Remainder of the Farm Lower Roodewal No. 169 ▪ The Farm Platfontein No. 240 ▪ The Farm Die Brak No. 241 ▪ Remainder of the Farm Rietpoort No. 243 <p>Preferred Oya to Kappa Power Line Corridor (namely Alternative 4) = Approx. 32.94km in length</p>
TECHNICAL DETAILS OF ASSOCIATED INFRASTRUCTURE		
	Access roads	<ul style="list-style-type: none"> ▪ Internal access roads will be required. Proposed power line requires 31m wide servitude for maintenance purposes; ▪ Servitude will be positioned within assessed power line corridors; and

		<ul style="list-style-type: none"> Existing site roads will be used wherever possible. However, where required, internal access roads will be constructed.
	Substations	<ul style="list-style-type: none"> Two (2) 33/132kV on-site Eskom substations. Referred to as Oya on-site Eskom Substation¹⁹ and Kudusberg on-site Eskom Substation²⁰; To serve Oya Energy Facility (part of separate on-going EIA process with DEFF Ref No.: 14/12/16/3/3/2/2009) and Kudusberg WEF (authorised under 14/12/16/3/3/1/1976/AM1); Will occupy areas of up to approx. 4ha each; Will likely be single storey buildings, however, some components will be higher; Will be step-up substations which will contain transformers for voltage step-up from medium voltage to high voltage. DC power will be converted into AC power in inverters and voltage will be stepped up to medium voltage in inverter transformers; Substations will connect proposed Oya Energy Facility as well as potentially nearby developments into Kappa Substation, from where electricity will be fed into the national grid (Figure 3); and Substations require separate EAs, in order to allow EAs to be handed over to Eskom.
	Overhead Power Line	<ul style="list-style-type: none"> One (1) new overhead power line with voltage capacity of up to approx. 132kV; Will link Kudusberg substation²⁰ (14/12/16/3/3/1/1976/AM1) to Oya substation and finally to Kappa Substation¹⁹, where electricity will be fed into national grid; Grid connection is thus to Kappa Substation; Type of power line towers being considered at this stage include both lattice and monopole towers; Assumed these towers will be located approx. 200m to 250m apart; Towers will be up to 45m in height, depending on terrain, but will ensure minimum overhead line clearances from buildings and surrounding infrastructure; and Location of towers may change during final design stages but would be within assessed and approved servitude.

The typical electricity generation process associated with a hybrid energy facility (such as the Oya Energy Facility – 14/12/16/3/3/2/2009) is illustrated in **Figure 3** below.

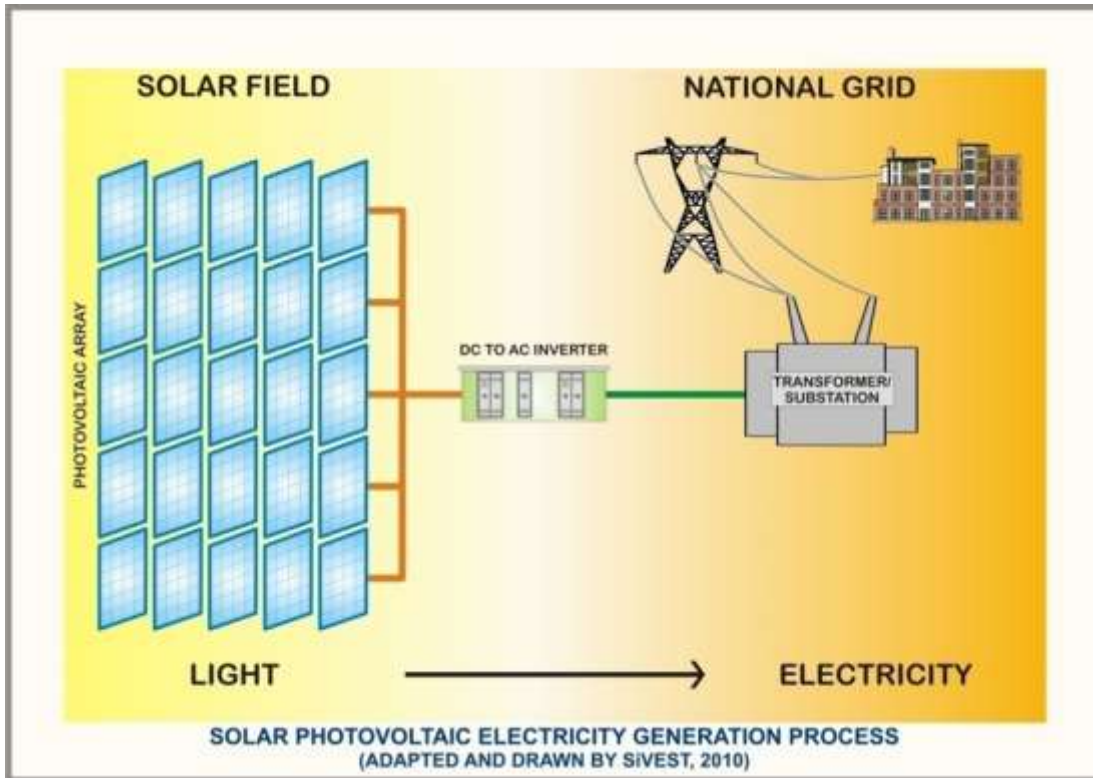


Figure 3: Solar PV electricity generation process (for illustration purposes and not necessarily an accurate depiction of the final layout of infrastructure components)

3.3 Alternatives

As per the 2014 EIA Regulations (as amended), feasible and reasonable alternatives are required to be considered during the BA process. Alternatives are defined in Chapter 1 of the 2014 EIA Regulations (as amended) as “*different means of meeting the general purpose and requirements of the activity*”. These alternatives may include:

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

Each of the alternatives in relation to the proposed development is discussed in the sections below.

3.3.1 The properties on which or location where it is proposed to undertake the activity

No site alternatives for this proposed development are being considered as the placement of the proposed substations and associated overhead power line is dependent on the location of the proposed Oya Energy Facility (part of a separate on-going EIA process with **DEFF Ref No.:** 14/12/16/3/3/2/2009) and authorised Kudusberg WEF (14/12/16/3/3/1/1976/AM1).

The major consideration for the site selection for the proposed Oya Energy Facility was the ability to potentially develop the proposed energy facility with an existing WEF. The Oya Energy Facility will possibly be developed within the Kudusberg WEF to potentially allow for infrastructure sharing, thereby reducing environmental impacts.

The project site for the Oya Eenergy Facility and Kudusberg WEF was identified through a pre-feasibility desktop analysis based on the estimation of the solar energy resource as well as grid connection suitability. The above-mentioned initial pre-feasibility assessments and site criteria assisted the applicant with the best suited site for a potential hybrid WEF and energy facility with accompanying substations and overhead power line. As such, the applicant decided to proceed with all of the development for the proposed Oya Energy Facility and Kudusberg WEF, as well as the associated substations and overhead power line.

The project site has a relatively flat topography which is suitable for the development of a hybrid solar PV facility and associated substations and overhead power line. In addition, the proposed development site also has low agricultural potential and is sparsely populated. The development site is easily accessible via the existing public gravel road which is linked to the R356 (see **Figure 8**) and allows direct access to the proposed facility. In addition, there is little existing infrastructure present within the application site that would constrain the proposed development. The proposed site is therefore considered highly suitable for the proposed development and no other locations are being considered.

3.3.2 The type of activity to be undertaken

No other activity alternatives are being considered. The proposed development is required to feed the electricity generated by the proposed Oya Energy Facility (part of separate on-going EIA process with DEFF Ref No.: 14/12/16/3/3/2/2009) as well as potentially the nearby developments into the national grid and therefore no other type of activity could be considered.

3.3.3 The design or layout of the activity

Design or layout alternatives are being considered and assessed as part of the BA process.

These include five (5) power line corridor route alternatives for the section of the proposed power line which connects the Oya substation to the Kappa substation (i.e. Oya to Kappa route) (detailed in **section 8**). Only one (1) route is however possible for the section of the proposed power line which connects the Kudusberg substation to the Oya substation (i.e. Kudusberg to Oya route) and therefore no alternatives could be provided for this section of proposed power line route. The power line corridors provide different route alignments contained within an assessment corridor of up to approximately 300m wide (i.e. 150m on either side of power line). This is to allow for flexibility to route the power line within the authorised corridors. The power line corridors (including all alternatives) were informed by the identified environmental sensitive / “no-go” areas, as various environmental specialists assessed all proposed corridor as part of their respective assessments.

The results of the comparative assessment of alternatives are summarised in **section 8**.

3.3.4 The technology to be used in the activity

No technology alternatives will be considered for the proposed substations and overhead power line. The type of technology to be used for the substations and power line will largely depend on the terrain and other technological and economic factors. The type of power line towers being considered at this stage include both lattice and monopole towers and it is assumed that these towers will be located approximately 200m to 250m apart. The towers will be up to 45m in height, depending on the terrain, but will ensure minimum overhead line clearances from buildings and surrounding infrastructure. The impacts on the environment of the different types of substation technology and power line tower types would be very similar during construction, operation and decommissioning. Therefore, no technology alternatives have been considered during the BA process. The choice of technology used will ultimately be determined by Eskom, as the proposed grid connection and substations (this application) will be handed over to Eskom.

3.3.5 *The operational aspects of the activity*

No operational alternatives were assessed as part of the BA process as none are available for substations and power lines.

3.3.6 *'No-go' alternative*

The 'no-go' alternative is the option of not fulfilling the proposed project as well as prevent the connection of the energy development in the area to feed electricity into the national grid. This alternative would result in no environmental impacts from the proposed project on the site or surrounding local area. It provides the baseline against which other alternatives are compared and will be considered throughout the report. Implementing the 'no-go' option would entail no development. The affected properties are currently not used for agricultural activities, although they are suitable for very low-level grazing. The 'no-go' would therefore imply that the land would remain as per the *status quo*, undeveloped.

On a regional scale, the 'No-go' alternative is not preferred as confirmed by specialists in **Section 7.2**. Renewable energy facilities and their associated grid connection infrastructure (i.e. substations and overhead power lines) in their own right are key to the success of South Africa's plan to build resilience against climate change. The proposed development aims to feed the electricity generated by the proposed Oya Energy Facility (part of separate on-going EIA process with DEFF Ref No.: [14/12/16/3/3/2/2009](#)) as well as potentially the nearby developments into the national grid. South Africa currently relies almost completely on fossil fuels as a primary energy source (approximately 72%). Coal combustion in South Africa is the main contributor to carbon dioxide emissions, which is one (1) of the main greenhouse gases that has been linked to climate change. With the global focus on climate change, the government is under pressure to explore alternative energy sources in addition to coal-fired power stations.

An emphasis has therefore been placed on securing South Africa's future power supply through the diversification of power generation sources. Furthermore, South Africa would have to invest in a power generation mix, and not solely rely on coal-fired power generation, to honour its commitments made under the Copenhagen Accord and subsequent Paris Agreement (ratified during November 2016) to mitigate climate change challenges.

The DEFF acknowledges the risks posed to South Africa by climate change confirming that '*South Africa has been experiencing the severe effects of drought conditions catalysed by the worst El Nino*

event in decades. The rising sea temperatures in the Pacific Ocean that resulted in increased temperatures and reduced rainfall in many parts of the world, was exacerbated by rising global temperatures associated with climate change. South African scientists and weather forecasters warn that this is what can be expected in the decades to come, if ambitious global action is not taken urgently to reduce the concentration of greenhouse gases in the atmosphere' (DEA, 2016b).

The current South African plan to achieve the goal set under the Paris Agreement, is rated as Highly Insufficient due to an unresolved strategy to secure a 'just transition' from coal to renewables, successfully and timeously implement a carbon tax and update the Integrated Resource Plan (Refer to **Section 3.2.3** for more information). In 2020, Climate Action Tracker rated South Africa's plan as "Highly Insufficient" as at the time we committed to increasing renewable energy to enable our emissions to peak between 2020 and 2025. Based on the dismal performance to date downgrading our climate action plan from medium to highly insufficient, it is clear that the trajectory South Africa is on is insufficient to reach the goals set to avoid catastrophic climate change.

With an increasing demand in energy predicted as confirmed by the emergency procurement of 2 000MW under the RMIPPPP and the looming REIPPPP round 5 (as per media statement regarding NERSA concurrence to ministerial Determination for procurement of 11 813MW of power released on 10 September 2020²³) and growing environmental concerns about fossil fuel-based energy systems, the development of large-scale renewable energy / hybrid facilities with associated substations and overhead power lines are strategically important for increasing the diversity of domestic energy supplies and avoiding energy imports in the country.

Not establishing the proposed grid connection infrastructure (substations and overhead power line) would be detrimental to the mandate that the government has set to promote the implementation of greener energy generation as it is required to feed energy generated from renewable resources into the national grid. This proposed development can commit to generate the bulk of the energy from clean, green energy (namely solar and wind). This allows the development to conform with the move towards a greener and cleaner energy generation mix in South Africa. This project could also contribute to addressing the problem and will aid in achieving South Africa's goals in terms of sustainability, energy security, mitigating energy cost risks, local economic development and national job creation. It will also assist in reducing the procurement of 100% fossil fuel in this RMIPPPP, and ensure that renewable energy and storage has a role to play in the future south African Energy mix.

The electricity grid infrastructure is part of the development package of the proposed Oya Energy Facility (DEFF Ref No: [14/12/16/3/3/2/2009](#)) and the one (1) cannot be developed without the other. The "no-go" alternative has thus been eliminated due to the fact that the identified environmental impacts can be suitably mitigated and that by not constructing the proposed development, the socio-economic and agricultural benefits would be lost.

A full assessment of the "no-go" alternative was undertaken by the specialists and is incorporated in **Section 7.4** of the DBAR.

²³ Issued by Department of Mineral Resources and Energy (DMRE): mediadesk@energy.gov.za; media@dmre.gov.za

4 LEGAL REQUIREMENTS AND GUIDELINES

4.1 Key Legal and Administrative Requirements Relating to the Proposed Development

4.1.1 Constitution of South Africa

The Constitution of South Africa (No. 108 of 1996) provides environmental rights and includes implications for environmental management. Section 24 of the Constitution states that:

'Everyone has the right –

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

The Constitution is the overarching legislation for South Africa. Although it provides for certain rights and obligations, the NEMA has been promulgated in order to manage the various spheres of both the social and natural environment.

4.1.2 National Environmental Management Act (NEMA) (Act No. 107 of 1998) – NEMA EIA Requirements

The National Environmental Management Act (NEMA) (Act No. 107 of 1998) was promulgated in 1998 but has since been amended on several occasions from this date. This Act replaces parts of the Environment Conservation Act (ECA) (Act No. 73 of 1989) with exception to certain parts pertaining to Integrated Environmental Management.

The act intends to provide for:

- co-operative environmental governance by establishing principles for decision-making on matters affecting the environment;
- institutions that will promote co-operative governance and procedures for coordinating environmental functions exercised by organs of state;
- to provide for the prohibition, restriction or control of activities which are likely to have a detrimental effect on the environment; and
- to provide for matters connected therewith.

The NEMA is the overarching legislation which governs the BA process and environmental management in South Africa. Sections 24 and 44 of the NEMA make provision for the promulgation of regulations that identify activities which may not commence without an EA. Activities that may significantly affect the environment must be considered, investigated and assessed prior to implementation. Comprehensive lists of such activities were gazetted and the proposed development triggers activities from two (2) of these listing notices (namely GN R. 325 and 327 as published on 7 April 2017) gazetted on 7 April 2017 (Government Gazette 326) (the 'EIA Regulations').

The proposed development is therefore subject to a BA process in terms of Section 21 to 24 of the 2014 EIA Regulations (as amended). It should be noted that the entire extent of the proposed development

is located within one (1) of the Strategic Transmission Corridors as defined and in terms of the procedures laid out in GN No. 113 of 16 February 2018, namely the Central Corridor. The proposed development irrespective of this would be subject to a BA process.

4.1.3 NEMA EIA Regulations, 2014 (as amended)

In terms of these Regulations, a BA process is required for the proposed development based on triggered activities. The proposed development is subject to a BA process in terms of Section 21 to 24 of the 2014 EIA Regulations (as amended).

The following Schedules of the Government Notice No. R. 984 and 985 of 4 December 2014 (as amended) are of relevance to the proposed development in question. All of the Listed Activities identified in terms of Sections 24(2) and 24D include:

Table 7: Listed activities in terms of the NEMA Regulations

Activity No(s):	Provide the relevant Basic Assessment Activity(ies) as set out in Listing Notice 1 of the EIA Regulations, 2014 as amended	Describe the portion of the proposed project to which the applicable listed activity relates.
11 (i)	<p>GN R. 327 Item 11: <i>The development of facilities or infrastructure for the transmission and distribution of electricity—</i></p> <p><i>(i) outside urban areas or industrial complexes with a capacity of more than 33 but less than 275 kilovolts.</i></p>	<p>The proposed development will include a 132kV power line and 33/132kV substations to feed electricity generated by a proposed hybrid energy facility (namely the proposed Oya Energy Facility – <u>14/12/16/3/3/2/2009</u>) owned by the applicant as well as potentially nearby energy developments into the national grid at the Kappa substation. The development will be located outside urban areas.</p>
12 (ii) (a) (c)	<p>GN R. 327 Item 12: <i>The development of:</i></p> <p><i>ii) infrastructure or structures with a physical footprint of 100 square metres or more;</i></p> <p><i>where such development occurs-</i></p> <p><i>(a) within a watercourse;</i></p> <p><i>(c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse.</i></p>	<p>The proposed development will entail the construction of buildings and other infrastructure with a physical footprint of approximately 100m² or more within a surface water feature / watercourse or within 32m of a surface water feature / watercourse. The infrastructure associated with the proposed development will avoid the identified surface water features / watercourses where possible, although some structures (such as roads) may occur within a surface water feature / watercourse and/or within 32m of a surface water feature / watercourse.</p> <p>A Surface Water Impact Assessment is being undertaken to assess the impacts of the proposed development on the identified surface water features / watercourses.</p>
19	<p>GN R. 327 Item 19: <i>The infilling or depositing of any material of more than 10 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10 cubic metres from a watercourse;</i></p>	<p>The proposed development will involve the excavation, removal, infilling, depositing and moving of more than 10 cubic metres (m³) of soil, sand, pebbles or rock from some of the identified surface water features / watercourses.</p>

		Although the layout of the proposed development will be designed to avoid the identified surface water features / watercourses as far as possible, some of the internal and/or access roads will need to traverse the identified surface water features / watercourses. In addition, during construction of these roads, soil will need to be removed from some of the identified surface water features / watercourses.
24 (ii)	GN R. 327 Item 24: <i>The development of a road - ii) with a reserve wider than 13,5 meters, or where no reserve exists where the road is wider than 8 metres.</i>	Internal access roads will be required to access the proposed substations, Operation and Maintenance (O&M) building sites and power line towers. Where required, internal access roads will be constructed.
27 (i)	GN R. 327 Item 27: <i>The clearance of an area of 1 hectares or more, but less than 20 hectares of indigenous vegetation.</i>	The proposed development includes the clearance of an area of 1 hectares (ha) or more, but less than 20ha of indigenous vegetation. This is not triggered as a result of the proposed power line as it is linear infrastructure. The proposed development however involves the construction of two (2) substations and O&M buildings which will each occupy an area of approximately 4ha (i.e. 8ha in total). All vegetation on the substation and O&M building sites will need to be cleared for construction. Cleared vegetation will amount to an area of up to approximately 8ha.
28 (ii)	GN R. 327 Item 28: <i>Residential, mixed, retail, commercial, industrial or institutional developments where such land was used for agriculture, game farming, equestrian purposes or afforestation on or after 01 April 1998 and where such development: (ii) will occur outside an urban area, where the total land to be developed is bigger than 1 hectare;</i>	The proposed development site is currently zoned for agricultural land use. The proposed development will result in special zoning being required, as an area greater than 1ha will be transformed into industrial / commercial use.
31 (i)	GN R. 327 Item 31: <i>The decommissioning of existing facilities, structures or infrastructure for - (i) any development and related operation activity or activities listed in this Notice, Listing Notice 2 of 2014 or Listing Notice 3 of 2014;</i>	Should the proposed development's Power Purchase Agreement (PPA) not be renewed after 20 years (anticipated operational lifespan of proposed development), the proposed development would need to be decommissioned. This would include the decommissioning of the overhead power line connecting the substations to the national grid.
48 (i) (a) (c)	GN R. 37 Item 48: <i>The expansion of- (i) infrastructure or structures where the physical footprint is expanded by 100 square metres or more; where such expansion occurs— (a) within a watercourse; or</i>	The proposed development will entail the expansion (upgrading) of roads and other infrastructure by 100m ² or more within a surface water feature / watercourse or within 32m from the edge of a surface water feature / watercourse. Although the layout of the proposed development will be designed to avoid the

	<i>(c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse;</i>	identified surface water features / watercourses as far as possible, some of the internal and access roads to be upgraded will need to traverse the identified surface water features / watercourses and construction will occur within some of the surface water features / watercourses and/or be within 32m of some of the surface water features / watercourses. A Surface Water Impact Assessment is being undertaken to assess the impacts of the proposed development on the identified surface water features / watercourses.
56 (i)(ii)	GN R. 327 Item 56: <i>The widening of a road by more than 6 metres, or the lengthening of a road by more than 1 kilometre –</i> <i>(i) Where the existing reserve is wider than 13.5metres, or</i> <i>(ii) where no reserve exists, where the existing road is wider than 8 metres</i>	As mentioned, internal access roads will be required to access the substations, O&M buildings and power line towers. Existing site roads will be used wherever possible, however, where required, internal access roads will be constructed. The existing internal and access roads will thus need to be upgraded by widening them more than 6m, or by lengthening them by more than 1 kilometre (km).
Activity No(s):	Provide the relevant Scoping and EIA Activity(ies) as set out in Listing Notice 2 of the EIA Regulations, 2014 as amended	Describe the portion of the proposed project to which the applicable listed activity relates.
Activity No(s):	Provide the relevant Basic Assessment Activity(ies) as set out in Listing Notice 3 of the EIA Regulations, 2014 as amended	Describe the portion of the proposed project to which the applicable listed activity relates.
4 ii (aa).	GN R. 324 Item 4: <i>The development of a road wider than 4 metres with a reserve less than 13,5 metres.</i> i. Western Cape ii. Areas outside urban areas: <i>(aa) Areas containing indigenous vegetation;</i>	Internal access roads will be required for the development. The proposed power line requires a 31m wide servitude for maintenance purposes. This servitude will be positioned within the assessed power line corridor. Existing site roads will be used wherever possible. However, where required, internal access roads will be constructed and will occur outside an urban area, within areas containing indigenous vegetation in the Western Cape Province.
18 g. ii. (ii); i. ii. (aa)	GN R. 324 Item 18: <i>The widening of a road by more than 4 meters, or the lengthening of a road by more than 1 kilometer-</i> g. Northern Cape ii. Outside urban areas: <i>(ii) Areas within a watercourse or wetland; or within 100 metres from the edge of a watercourse or wetland;</i> i. Western Cape ii. All areas outside urban areas:	Internal access roads will be required. Existing site roads will be used wherever possible. However, where required, internal access roads will be constructed. Existing access roads will thus need to be upgraded. Internal access roads will be widened by more than 4m or lengthened by more than 1km. These roads will occur within the Northern and Western Cape Provinces, outside urban areas. In addition, this widening of the roads will occur within areas containing indigenous vegetation in the Western Cape Province. The proposed development only occurs within ESAs in the

	(aa) Areas containing indigenous vegetation	<p>Northern Cape Province. The proposed development will also occur within a watercourse and/or within 100m from the edge of a watercourse within the Northern Cape Province.</p> <p>A Terrestrial Ecology Impact Assessment has been undertaken to assess the impacts of the proposed development on indigenous vegetation, as well as the CBAs and ESAs. In addition, a Surface Water Impact Assessment has been undertaken to assess the impacts of the proposed development on the identified watercourses.</p>
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4.1.4 Environmental Impact Assessment (EIA) Guideline for Renewable Energy Projects, DEFF Notice 989 of 2015

The purpose of this document is primarily to provide guidance on the environmental management legal framework applicable to renewable energy operations and all the role players in the sector. The guideline is principally intended for use by the following stakeholder groups:

- Public Sector Authorities (as regulator and/or competent authority);
- Joint public sector authorities and project funders (e.g., Eskom, IDC, etc.);
- Private Sector Entities (as project funder/developer/consultant); and
- Other interested and affected parties (as determined by the project location and/or scope).

This guideline seeks to identify activities requiring authorisation prior to commencement of that activity and provide an interface between national EIA regulations and other legislative requirements of various authorities.

The guidelines are applicable for the construction, installation and/or development of the following renewable energy projects:

- Concentrating Solar Power (CSP) Plant;
- Wind Energy Facility (WEF);
- Hydropower Station; and
- **Photovoltaic (PV) Power Plant (Applicable to this development)**

As the proposed development is for electricity distribution infrastructure which will feed the electricity generated by the proposed Oya Energy Facility (part of separate on-going EIA process with **DEFF Ref No.: 14/12/16/3/3/2/2009**) as well as potentially the nearby developments into the national grid, it is subject to the recommendations proposed in the guidelines.

4.1.5 National Energy Act (Act No. 34 of 2008)

South Africa has two (2) acts that direct the planning and development of the country's electricity sector, namely:

- i. The National Energy Act of 2008 (Act No. 34 of 2008); and
- ii. The Electricity Regulation Act (ERA) of 2006 (Act No. 4 of 2006) (see **section 4.1.6**).

The National Energy Act (Act No. 34 of 2008), promulgated in 2008, has, as one (1) of its key objectives, the promotion of diversity of supply of energy and its sources. From this standpoint, the Act directly references the importance of the renewable energy (RE) sector, with a mention of the solar energy sector included. The aim is to ensure that the South African economy is able to grow and develop, fast-tracking poverty alleviation, through the availability of a sustainable, diverse energy mix. Moreover, the goal is to provide for the increased generation and consumption of RE (Republic of South Africa, 2008).

4.1.6 *Electricity Regulation Act (Act No. 4 of 2006)*

In 2011, the electricity regulation on new generation capacity was published under Section 35(4) of the Electricity Regulation Act (ERA) (Act No. 4 of 2006). These regulations apply to the procurement of new generation capacity by organs of state.

The objectives of the regulations include:

- To facilitate planning for the establishment of new generation capacity;
- The regulation of entry by a buyer and a generator into a Power Purchase Agreement (PPA);
- To set minimum standards or requirements for PPAs;
- The facilitation of the full recovery by the buyer of all costs efficiently incurred by it under, or in connection with, a PPA including a reasonable return based on the risks assumed by the buyer thereunder and to ensure transparency and cost reflectivity in the determination of electricity tariffs; and
- The provision of a framework for implementation of an Independent Power Producer (IPP) procurement programme and the relevant agreements concluded.

The Act establishes a National Energy Regulator as the custodian and enforcer of the National Electricity Regulatory Framework. The Act also provides for licenses and registration as the manner in which generation, transmission, distribution, trading and the import and export of electricity are regulated.

4.1.7 *National Heritage Resources Act (NHRA) (Act No. 25 of 1999)*

This Act requires investigation to determine the impact of heritage resources when developments exceed the thresholds listed in section 38(1) of the act:

- (a) the construction of a road, wall, power line, pipeline, canal or other similar form of linear development or barrier exceeding 300m in length;
- (b) the construction of a bridge or similar structure exceeding 50m in length;
- (c) any development or other activity which will change the character of a site—
 - (i) exceeding 5000m² in extent; or
 - (ii) involving three (3) or more existing erven or subdivisions thereof; or
 - (iii) involving three (3) or more erven or divisions thereof which have been consolidated within the past five (5) years; or
 - (iv) the costs of which will exceed a sum set in terms of regulations by the South African Heritage Resources Agency (SAHRA) or a provincial heritage resources authority;
- (d) the re-zoning of a site exceeding 10000m² in extent; or
- (e) any other category of development provided for in regulations by SAHRA or a provincial heritage resources authority,

The proposed development would involve; (a) the construction of linear infrastructure (namely a power line) exceeding 300m in length, (c) the development of on-site substations and an overhead power line that will change the character of three (3) or more existing erven and (d) the rezoning of a site that will exceed 1ha.

The NHRA stipulates that cultural heritage resources may not be disturbed without authorisation from the relevant heritage authority. Section 34(1) of the NHRA states that, '*no person may alter or demolish any structure or part of a structure which is older than 60 years without a permit issued by the relevant provincial heritage resources authority...*' The NHRA is utilised as the basis for the identification, evaluation and management of heritage resources and in the case of Cultural Resource Management (CRM) those resources specifically impacted on by development as stipulated in Section 38 of NHRA.

The law ensures community participation in the protection of national heritage resources and will involve all three (3) levels of government in the management of the country's national heritage. The SAHRA will establish and maintain a national policy, strategy plans and standards for heritage resources management and will monitor the system as a whole.

A Heritage Impact Assessment (**Appendix 6E**) has been conducted to explore how the proposed development may impact on heritage resources as protected by the Act.

With regards to the Northern Cape Provincial Heritage Resources Authority (NCPHRA), it was advised by the SAHRA that the NCPHRA does not have the authority to provide comments on section 38 applications. It was NCPHRA must only be consulted for comments if a structure as defined and protected by section 34 is impacted. All section 38(1) and 38(8) cases for the Northern Cape are processed by the SAHRA via the South African Heritage Resources Information System (SAHRIS). The correspondence from the SAHRA confirming this has been attached as **Appendix 9F**. In light of this, SAHRA will be consulted throughout the BA process in order to obtain comments on the proposed development from a heritage perspective via the SAHRIS. The NCPHRA will however also be included in the public participation process.

In addition, Heritage Western Cape (HWC) will be consulted throughout the BA process in order to obtain comments on the proposed development from a heritage perspective as majority of the proposed development falls within the Western Cape Province. Comments from both HWC and the SAHRA will therefore requested.

This proposed development triggers sections 38(1) and 38(8) of the NHRA (Act 25 of 1999) as this proposed development constitutes a linear development exceeding 300m and requires an evaluation of impacts to heritage resources in terms of other legislation (namely the NEMA, as amended). This section states that the consenting authority (DEA&DP in the Western Cape and DENC in the Northern Cape) must ensure that the assessment completed for impacts to heritage satisfies the requirements of the relevant heritage authority in terms of section 38(3) of the NHRA (HWC in the Western Cape and SAHRA in the Northern Cape), and that the recommendations of the relevant heritage authority must be taken into consideration prior to the granting of consent.

Section 38(3) of the NHRA details the information that MUST be included in a HIA drafted in terms of section 38 of the NHRA. Furthermore, HWC has published guidelines on their minimum requirements for HIAs and the SAHRA has published Minimum Standards for Archaeological and Palaeontological Impact Assessments. All such guidelines and minimum standards have been complied with in the drafting of the HIA.

In terms of section 38(10) of the NHRA, if the applicant complies with the recommendations and requirements of the relevant heritage authority issued in terms of section 38(8) of the NHRA, then the

applicant MUST be exempted from compliance with all other (general) protections included in the NHRA. As such, as long as the requirements of the heritage authority are satisfied, no permit application is required for the destruction of or impact to any heritage resource that has been identified in the HIA.

Should any heritage resources be newly uncovered during excavation activities i.e. heritage resources that were not identified in the HIA, then as per the recommendations of the HIA, work must cease in that area and the relevant heritage authority must be contacted regarding a way forward. This HIA recommends that the HWC Chance Fossils Finds procedure be implemented in order to direct such actions.

4.1.8 National Water Act (NWA) (Act No. 36 of 1998, as amended)

The National Water Act (NWA) (Act No. 36 of 1998), as amended, was promulgated on the 20th of August 1998. This Act was created in order to ensure the protection and sustainable use of water resources (including wetlands) in South Africa. This Act is important in that it provides a framework to protect water resources against over-exploitation and to ensure that there is water for socio-economic and economic development, human needs and to meet the needs of the aquatic environment. The Act also recognises that water belongs to the whole nation for the benefit of all people.

It is important to note that water resources (including wetlands) are protected under the Act. Under the NWA, a 'water resource' includes a watercourse, surface water, estuary, or aquifer. Specifically, a watercourse is defined as (*inter alia*):

- A river or spring;
- A natural channel in which water flows regularly or intermittently; and
- A wetland, lake or dam into which, or from which, water flows.

One (1) of the main aims of the Act is the protection of water resources. 'Protection' in relation to a water resource entails:

- Maintenance of the quality of the water resource to the extent that the water use may be used in a sustainable way;
- Prevention of degradation of the water resource; and
- The rehabilitation of the water resource.

In the context of the proposed development and any potential impact on water resources, the definition of pollution and pollution prevention contained within the Act is relevant. 'Pollution', as described by the Act, is the direct or indirect alteration of the physical, chemical or biological properties of a water resource, so as to make it (*inter alia*):

- less fit for any beneficial purpose for which it may reasonably be expected to be used; or
- harmful or potentially harmful to the welfare of human beings, to any aquatic or non-aquatic organisms, or to the resource quality.

This definition of pollution is quite wide-ranging, and it applies to all types of water resource. The inclusion of physical properties of a water resource within the definition of pollution entails that any physical alterations to a water body (for example, the excavation of a wetland or changes to the morphology of a water body) can be considered to be pollution. Activities which cause alteration of the biological properties of a watercourse (i.e. the fauna and flora contained within that watercourse) are also considered pollution.

In terms of section 19 of the Act, owners / managers / people occupying land on which any activity or process undertaken which causes / or is likely to cause pollution of a water resource must take all

reasonable measures to prevent any such pollution from occurring, continuing or recurring. These measures may include measures to (*inter alia*):

- measures to cease, modify, or control any act or process causing the pollution;
- comply with any prescribed waste standard or management practice;
- contain or prevent the movement of pollutants;
- remedy the effects of the pollution; and
- remedy the effects of any disturbance to the bed and banks of a watercourse.

From a licensing perspective, according to the NWA, the following are considered 'water uses' and will require a water use license application (WULA):

- a) Taking water from a water resource;
- b) Storing water;
- c) Impeding or diverting the flow of water in a watercourse;
- d) Engaging in stream flow reduction activity contemplated in Section 36 of the NWA;
- e) Engaging in a controlled activity identified as such in Section 37 (1) or declared under Section 38(1) of the NWA;
- f) Discharging waste or water containing waste into a water resource through a pipe, canal, sewer, sea outfall or other conduit;
- g) Disposing of waste in a manner which may detrimentally impact on a water resource;
- h) Disposing of waste in a manner of water which contains waste from, or which has been heated in any industrial or power generation process;
- i) Altering the bed, banks, course or characteristics of a watercourse;
- j) Removing, discharging or disposing of water found underground if it is necessary for efficient continuation of an activity or for the safety of people; and
- k) Using water for recreational purposes.

Aquatic Sensitivity

The following legislative requirements were considered during the assessment. A detailed description of these legislative requirements is presented in Appendix B of the Surface Water Impact Assessment Report (**Appendix 6E** of DBAR):

- Constitution of the Republic of South Africa, 1996;
- The National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA);
- The National Water Act, 1998 (Act No. 36 of 1998) (NWA);
- Government Notice 509 as published in the Government Gazette 40229 of 2016 as it relates to the National Water Act, 1998 (Act No. 36 of 1998);
- The National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004) (NEMBA); and
- The National Environmental Management: Biodiversity Act, 2014 (Alien and Invasive Species Regulations, 2014).

It is important to note that in terms of the definition of a watercourse as per the NWA (See Appendix B of Surface Water Impact Assessment Report), all of the natural watercourses associated with the proposed development (including the ephemeral rivers and tributaries with riparian vegetation and the episodic drainage lines with no riparian vegetation) will be regulated in terms of Section 21(c) and (i) of the National Water Act, 1998 (Act No. 36 of 1998) as well as the applicable zones of regulation. All the natural watercourses will thus require further authorisation from the DEFF and the Department of Water and Sanitation (DWS). This report aids in providing relevant information for these authorisation processes.

According to Macfarlane *et al.*, (2015) the definition of a buffer zone is variable, depending on the purpose of the buffer zone, however in summary, it is considered to be "a strip of land with a use, function or zoning specifically designed to protect one area of land against impacts from another". Buffer

zones are considered important to provide protection of basic ecosystem processes (in this case, the protection of aquatic and wetland ecological services), reduce impacts on watercourses arising from upstream activities (e.g. by removing or filtering sediment and pollutants), provision of habitat for aquatic and wetland species as well as for certain terrestrial species, and a range of ancillary societal benefits (Macfarlane *et. al.*, 2015). It should be noted, however that buffer zones are not considered to be effective mitigation against impacts such as hydrological changes arising from stream flow reduction, impoundments or abstraction, nor are they considered to be effective in the management of point-source discharges or contamination of groundwater, both of which require site-specific mitigation measures (Macfarlane *et. al.*, 2015).

The definition and motivation for a regulated zone of activity for the protection of the assessed watercourses can be summarised as follows:

Articles of Legislation and the relevant zones of regulation applicable to each article.

Regulatory authorisation required	Zone of applicability
<p>Water Use License Application in terms of the National Water Act, 1998 (Act No. 36 of 1998).</p> <p>Department of Water and Sanitation (DWS)</p>	<p>Government Notice 509 as published in the Government Gazette 40229 of 2016 as it relates to the National Water Act, 1998 (Act No. 36 of 1998)</p> <p>In accordance with GN509 of 2016 as it relates to the National Water Act, 1998 (Act No. 36 of 1998), a regulated area of a watercourse in terms of water uses as listed in Section 21c and 21i is defined as:</p> <ul style="list-style-type: none"> • the outer edge of the 1 in 100-year flood line and/or delineated riparian habitat, whichever is the greatest distance, measured from the middle of the watercourse of a river, spring, natural channel, lake or dam; • in the absence of a determined 1 in 100-year flood line or riparian area the area within 100 m from the edge of a watercourse where the edge of the watercourse is the first identifiable annual bank fill flood bench; or • a 500m radius from the delineated boundary (extent) of any wetland or pan in terms of this regulation.

A 32m Zone of Regulation (ZoR) in accordance with the NEMA, as amended, and in the absence of a defined 1 in 100 year flood line, a 100m ZoR in accordance with Government Notice 509 as published in the Government Gazette 40229 of 2016 as it relates to the NWA were applied to the ephemeral rivers and tributaries with riparian vegetation and the episodic drainage lines with no riparian vegetation associated with the proposed development. The proposed power lines will be routed over several watercourses. Should pylons be located within the 100m GN509 regulated area, a Water Use Authorisation (WUA) from the DWS is required prior to commencement of any construction²⁴.

In light of the above, there are a number of stipulations within the NWA that are relevant to the potential impacts on rivers, streams and wetlands that may be associated with the proposed development. A Surface Water Impact Assessment (**Appendix 6E**) has however been conducted to explore how the proposed development may impact on identified water resources as protected by the Act. Should the proposed development require a General Authorisation (GA) or WUA, it will be determined and applied for separately prior to construction.

²⁴ It should be noted that a General Authorisation (GA) is required for the proposed roads, should these be constructed in the dry period

4.1.9 National Environmental Management: Biodiversity Act (NEM:BA) (Act No. 10 of 2004, as amended)

As the principal national act regulating biodiversity protection, NEM:BA, which is administered by DEFF, is concerned with the management and conservation of biological diversity, as well as the use of indigenous biological resources in a sustainable manner. The term biodiversity according to the Convention on Biodiversity (CBD) refers to the variability among living organisms from all sources including, inter alia terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity in genes, species and ecosystems.

The overarching aim of the National Environmental Management: Biodiversity Act (NEM:BA) (Act No. 10 of 2004), within the framework of the NEMA, is to provide for:

- The management and conservation of biological diversity within South Africa, and of the components of such biological diversity;
- The use of indigenous biological resources in a sustainable manner; and
- The fair and equitable sharing among stakeholders of benefits arising from bio-prospecting involving indigenous biological resources.

In terms of this Act, the developer has a responsibility for:

- The conservation of endangered ecosystems and restriction of activities according to the categorisation of the area (not just by listed activity as specified in the EIA regulations);
- Promote the application of appropriate environmental management tools in order to ensure integrated environmental management of activities thereby ensuring that all development within the area are in line with ecological sustainable development and protection of biodiversity; and
- Limit further loss of biodiversity and conserve endangered ecosystems.

The South African National Biodiversity Institute (SANBI) was established in terms of the NEM:BA, its purpose being (*inter alia*) to report on the status of the country's biodiversity and the conservation status of all listed threatened or protected species and ecosystems.

The NEM:BA provides for a range of measures to protect ecosystems and for the protection of species that are threatened or in need of protection to ensure their survival in the wild, including a prohibition on carrying out a '*restricted activity*' involving a specimen of a listed threatened or protected species without a permit issued in terms of Chapter 7 of the Act. According to Section 57 of the Act, '*Restricted activities involving listed threatened or protected species*':

- A person may not carry out a restricted activity involving a specimen of a listed threatened or protected species without a permit issued in terms of Chapter 7.

Such activities include any that are '*of a nature that may negatively impact on the survival of a listed threatened or protected species*'. Lists of critically endangered, endangered, vulnerable and protected species have been published and a permit system for listed species has been established.

Alien and Invasive Species

Chapter 5 of NEM:BA relates to species and organisms posing a potential threat to biodiversity. The Act defines alien species and provides lists of invasive species in regulations. The Alien and Invasive Species (AIS) Regulations, in terms of Section 97(1) of NEM:BA, was published in Government Notice R598 in Government Gazette 37885 in 2014 (NEM:BA, 2014). The Alien and Invasive Species (AIS) lists were subsequently published in Government Notice R 864 of 29 July 2016 (NEM:BA, 2016).

According to Section 75 of the Act, "Control and eradication of listed invasive species":

- (1) Control and eradication of a listed invasive species must be carried out by means of methods that are appropriate for the species concerned and the environment in which it occurs.
- (2) Any action taken to control and eradicate a listed invasive species must be executed with caution and in a manner that may cause the least possible harm to biodiversity and damage to the environment.
- (3) The methods employed to control and eradicate a listed invasive species must also be directed at the offspring, propagating material and re-growth of such invasive species in order to prevent such species from producing offspring, forming seed, regenerating or re-establishing itself in any manner.

The National Environmental Management: Biodiversity Act (NEMBA) regulates all invasive organisms in South Africa, including a wide range of fauna and flora. Chapter 5 of the Act relates to species and organisms posing a potential threat to biodiversity. The purpose of Chapter 5 is:

- a) to prevent the unauthorized introduction and spread of alien species and invasive species to ecosystems and habitats where they do not naturally occur;
- b) to manage and control alien species and invasive species to prevent or minimize harm to the environment and to biodiversity in particular;
- c) to eradicate alien species and invasive species from ecosystems and habitats where they may harm such ecosystems or habitats;

According to Section 65 of the Act, "Restricted activities involving alien species":

- 1) A person may not carry out a restricted activity involving a specimen of an alien species without a permit issued in terms of Chapter 7. Restricted activities include the following:
 - a. Importing into the Republic, including introducing from the sea, any specimen of a listed invasive species.
 - b. Having in possession or exercising physical control over any specimen of a listed invasive species.
 - c. Growing, breeding or in any other way propagating any specimen of a listed invasive species, or causing it to multiply.
 - d. Conveying, moving or otherwise translocating any specimen of a listed invasive species.
 - e. Selling or otherwise trading in, buying, receiving, giving, donating or accepting as a gift, or in any other way acquiring or disposing of any specimen of a listed invasive species.
 - f. Spreading or allowing the spread of any specimen of a listed invasive species.
 - g. Releasing any specimen of a listed invasive species.
 - h. Additional activities that apply to aquatic species.
- 2) A permit referred to in subsection (1) may be issued only after a prescribed assessment of risks and potential impacts on biodiversity is carried out.

An "**alien species**" is defined in the Act as:

- a) a species that is not an indigenous species; or
- b) an indigenous species translocated or intended to be translocated to a place outside its natural distribution range in nature, but not an indigenous species that has extended its natural distribution range by means of migration or dispersal without human intervention.

According to Section 71 of the Act, "Restricted activities involving listed invasive species":

- 1) A person may not carry out a restricted activity involving a specimen of a listed invasive species without a permit issued in terms of Chapter 7.
- 2) A permit referred to in subsection (1) may be issued only after a prescribed assessment of risks and potential impacts on biodiversity is carried out.

An "**invasive species**" is defined in the Act as any species whose establishment and spread outside of its natural distribution range:

- a) threaten ecosystems, habitats or other species or have demonstrable potential to threaten ecosystems, habitats or other species; and
- b) may result in economic or environmental harm or harm to human health.

A "**listed invasive species**" is defined in the Act as any invasive species listed in terms of section 70(1).

According to Section 73 of the Act, "Duty of care relating to listed invasive species":

- 2) A person who is the owner of land on which a listed invasive species occurs must-
 - a) notify any relevant competent authority, in writing, of the listed invasive species occurring on that land;
 - b) take steps to control and eradicate the listed invasive species and to prevent it from spreading; and
 - c) take all the required steps to prevent or minimize harm to biodiversity.

According to Section 75 of the Act, "Control and eradication of listed invasive species":

- (1) Control and eradication of a listed invasive species must be carried out by means of methods that are appropriate for the species concerned and the environment in which it occurs.
- (2) Any action taken to control and eradicate a listed invasive species must be executed with caution and in a manner that may cause the least possible harm to biodiversity and damage to the environment.
- (3) The methods employed to control and eradicate a listed invasive species must also be directed at the offspring, propagating material and re-growth of such invasive species in order to prevent such species from producing offspring, forming seed, regenerating or re-establishing itself in any manner.

Government Notice No. 1002 of 2011: National List of Ecosystems that are Threatened and in need of protection

Published under Section 52(1)(a) of the National Environmental Management: Biodiversity Act (Act No. 10 of 2004). This Act provides for the listing of threatened or protected ecosystems based on national criteria. The list of threatened terrestrial ecosystems supersedes the information regarding terrestrial ecosystem status in the National Spatial Biodiversity Assessment (2004).

GNR 151: Critically Endangered, Endangered, Vulnerable and Protected Species List

Published under Section 56(1) of the National Environmental Management: Biodiversity Act (Act No. 10 of 2004).

GNR 1187: Amendment of Critically Endangered, Endangered, Vulnerable and Protected Species List

Published under Section 56(1) of the National Environmental Management: Biodiversity Act (Act No. 10 of 2004).

Government Notice No. 40733 of 2017: Draft National Biodiversity Offset Policy

Published under the National Environmental Management Act (Act No. 107 of 1998). The aim of the Policy is to ensure that significant residual impacts of developments are remedied as required by NEMA, thereby ensuring sustainable development as required by section 24 of the Constitution of the Republic of South Africa, 1996. This policy should be taken into consideration with every development application that still has significant residual impact after the Mitigation Sequence has been followed. The mitigation sequence entails the consecutive application of avoiding or preventing loss, then at minimizing or mitigating what cannot be avoided, rehabilitating where possible and, as a last resort, offsetting the residual impact. The Policy specifies that one impact that has come across consistently as unmitigable is the rapid and consistent transformation of certain ecosystems and vegetation types, leading to the

loss of ecosystems and extinction of species. The Policy specifically targets ecosystems where the ability to reach protected area targets is lost or close to being lost. However, the Policy states that “[w]here ecosystems remain largely untransformed, intact and functional, an offset would not be required for developments that lead to transformation, provided they have not been identified as a biodiversity priority”. Biodiversity offsets should be considered to remedy residual negative impacts on biodiversity of ‘medium’ to ‘high’ significance. Residual impacts of ‘very high’ significance are a fatal flaw for development and residual biodiversity impacts of ‘low’ significance would usually not require offsets. The Policy indicates that impacts should preferably be avoided in protected areas, CBAs, verified wetland and river features and areas earmarked for protected area expansion.

The NEM:BA is relevant to the proposed development as the construction of the substations and overhead power line may impact negatively on biodiversity. Although the proposed development will avoid National Protected Area Expansion Strategy (NPAES) Focus areas, the proposed development will likely fall within Critical Biodiversity Areas (CBAs) and Ecological Support Areas (ESAs) (**Figure 4**). The project proponent is therefore required to take appropriate reasonable measures to limit the impacts on biodiversity, to obtain permits if required and to also invite the SANBI to provide commentary on any documentation resulting from the proposed development.

It should be noted that a Terrestrial Ecology Impact Assessment (**Appendix 6F**) has been undertaken to explore how the proposed development may impact on biodiversity as protected by the Act. **Based on site characteristics and the impact assessment undertaken here, no offsets were considered to be required for the current project.**

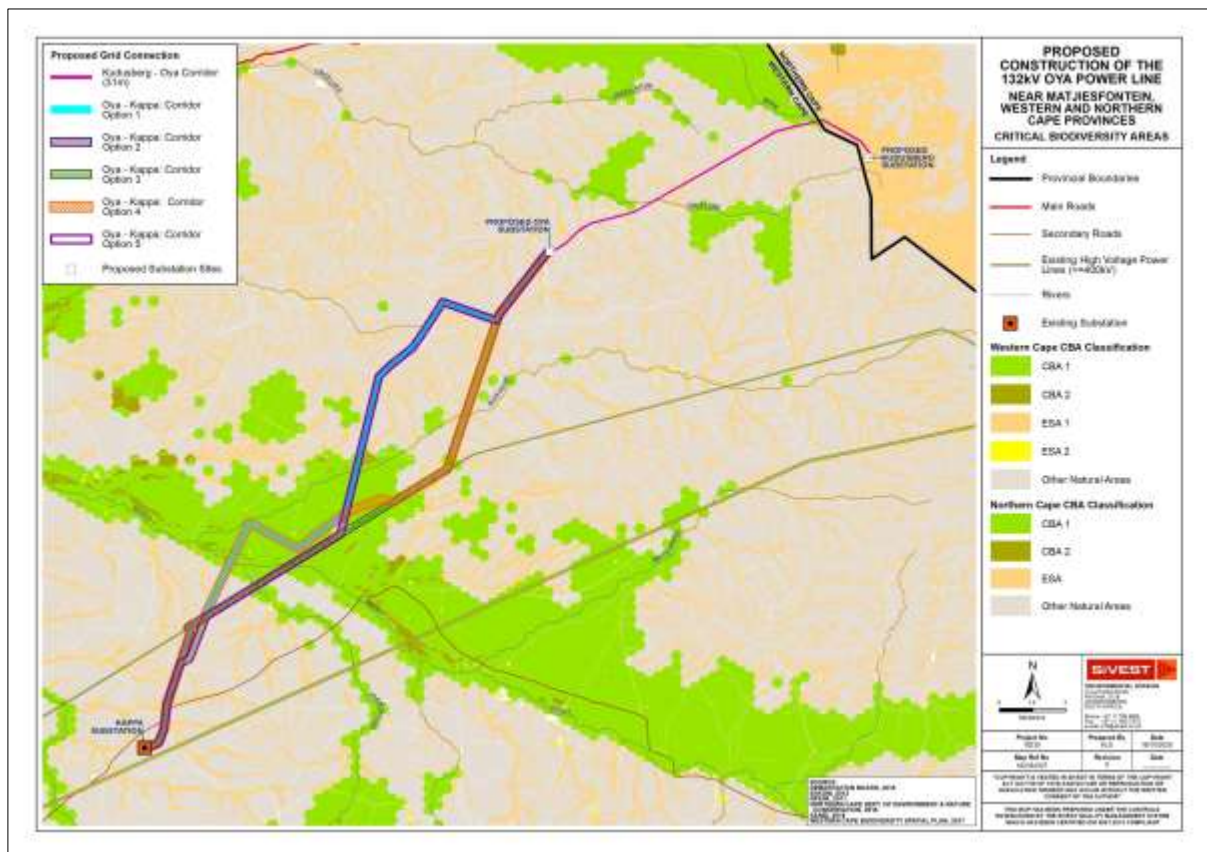


Figure 4: Western Cape and Northern Cape CBA / ESA map for the study area

4.1.10 Convention on Biodiversity (CBD)

South Africa became a signatory to the United Nations Convention on Biological Diversity (CBD) in 1993, which was ratified in 1995. The CBD requires signatory states to implement objectives of the Convention, which are the conservation of biodiversity; the sustainable use of biological resources and the fair and equitable sharing of benefits arising from the use of genetic resources. According to Article 14 (a) of the CBD, each Contracting Party, as far as possible and as appropriate, must introduce appropriate procedures, such as environmental impact assessments of its proposed projects that are likely to have significant adverse effects on biological diversity, to avoid or minimize these effects and, where appropriate, to allow for public participation in such procedures.

4.1.11 National Environmental Management: Protected Areas Act (NEM: PAA) (Act No. 57 of 2003, as amended)

The overarching aim of the National Environmental Management: Protected Areas Act (NEM: PAA) (Act No. 57 of 2003, as amended), within the framework of NEMA, is to:

- provide for the declaration and management of protected areas;
- provide for co-operative governance in the declaration and management of protected areas;
- affect a national system of protected areas in South Africa as part of a strategy to manage and conserve its biodiversity;
- provide for a representative network of protected areas on state land, private land and communal land;
- promote sustainable utilisation of protected areas for the benefit of people, in a manner that would preserve the ecological character of such areas;
- promote participation of local communities in the management of protected areas, where appropriate; and
- provide for the continued existence of South African National Parks.

The proposed development falls **outside** any formally protected areas and outside the areas earmarked as part of the NPAES (**Figure 4**).

4.1.12 National Forests Act (NFA) (Act No. 84 of 1998)

The National Forest Act (NFA) (Act No. 24 of 1998) was enacted to:

- Provide for the protection, management and utilisation of forests;
- The protection of certain plant and animal life;
- The regulation of trade in forest produce; and
- The control and management of a national hiking way system and National Botanic Gardens.

The NFA enforces the necessity for a license to be obtained prior to destroying any indigenous tree in a natural forest and, subject to certain exemptions, cutting, disturbing, damaging, destroying or removing any protected tree. The list of protected trees is currently contained in GN 908 of 21 November 2014. Licenses are issued by the Minister and are subject to periods and conditions as may be stipulated.

Protected trees

According to this act, the Minister may declare a tree, group of trees, woodland or a species of trees as protected. The prohibitions provide that 'no person may cut, damage, disturb, 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'.

Forests

Prohibits the destruction of indigenous trees in any natural forest without a licence.

The NFA is relevant to the proposed development as the removal and/or disturbance and/or clearance of indigenous vegetation will be required and a license in terms of the NFA may be required for this to be done.

It should be noted that the Ecologist confirmed that there is one (1) plant species protected according to the NEM:BA that could potentially occur on-site, although it was not seen. This is *Hoodia gordonii*. There are no other plant species protected according to this legislation that have a geographical distribution that includes the study area. In addition, there are no protected tree species with a geographical distribution that includes the region in which the proposed project is located. There is one (1) plant species that has a geographical distribution that ends south of the study area, namely *Podocarpus latifolius*, but this species does not occur near to the site.

4.1.13 National Veld and Forest Fire Act (Act No. 101 of 1998)

Provides requirements for veldfire prevention through firebreaks and required measures for fire-fighting. Chapter 4 of the Act places a duty on landowners to prepare and maintain firebreaks. Chapter 5 of the Act places a duty on all landowners to acquire equipment and have available personnel to fight fires.

4.1.14 Conservation of Agricultural Resources Act (CARA) (Act No. 43 of 1983)

The Conservation of Agricultural Resources Act (CARA) (Act No. 43 of 1983) controls the utilisation of natural agricultural resources in South Africa. The Act promotes the conservation of soil, water sources and vegetation as well as the combating weeds and invader plants.

The primary objective of the Act is to conserve natural agricultural resources by:

- maintaining the production potential of land;
- combating and preventing erosion and weakening or destruction of the water resources;
- protecting vegetation; and
- combating weeds and invaders plants.

Rehabilitation after disturbance to agricultural land is managed by this Act. The CARA may be of relevance to the proposed development as the construction of a substations and overhead power line may impact on agricultural resources and vegetation on the affected sites. The Act prohibits the spreading of weeds and prescribes control measures that need to be complied with in order to achieve this. As such, measures will need to be taken to protect agricultural resources and prevent weeds and exotic plants from invading the sites as a result of the proposed development.

Declared Weeds and Invaders in South Africa are categorised according to one of the following categories:

- Category 1 plants: are prohibited and must be controlled.

- Category 2 plants: (commercially used plants) may be grown in demarcated areas providing that there is a permit and that steps are taken to prevent their spread.
- Category 3 plants: (ornamentally used plants) may no longer be planted; existing plants may remain, as long as all reasonable steps are taken to prevent the spreading thereof, except within the floodline of watercourses and wetlands.

An Agricultural and Soils Impact Assessment (**Appendix 6A**) has been conducted to explore how the proposed development may impact on the agricultural production potential of the proposed affected sites. According to this assessment, no application is required in terms of the CARA and the BA process covers the required aspects of this.

4.1.15 Subdivision of Agricultural Land Act (SALA) (Act No. 70 of 1970, as amended)

The Subdivision of Agricultural Land Act (SALA) (Act No. 70 of 1970, as amended) controls the subdivision of all agricultural land in South Africa; prohibiting certain actions pertaining to agricultural land. Under the Act, the owner of agricultural land is required to obtain consent from the Minister of Agriculture in order to subdivide agricultural land.

Power lines require the registration of a servitude for each farm portion crossed. In terms of the SALA, the registration of a power line servitude requires written consent of the Minister if the following two (2) conditions apply:

- if the servitude width exceeds 15m; and
- if Eskom is not the applicant for the servitude.

If one (1) or both of these conditions do not apply, then no agricultural consent is required. Eskom is currently exempt from agricultural consent for power line servitudes.

However, the relevant Department of Agriculture, Land Reform and Rural Development will be notified as an I&AP.

4.1.16 National Road Traffic Act (NRTA) (Act No. 93 of 1996, as amended)

The National Road Traffic Act (NRTA) (Act No. 93 of 1996, as amended) provides for all road traffic matters and is applied uniformly throughout South Africa. The Act enforces the necessity of registering and licensing motor vehicles. It also stipulates requirements regarding fitness of drivers and vehicles as well as making provision for the transportation of dangerous goods.

All the requirements stipulated in the NRTA will need to be complied with during the construction and operational phases of the proposed development.

4.1.17 Civil Aviation Act (CAA) (Act No. 13 of 2009)

The Civil Aviation Act (CAA) (Act No. 13 of 2009) controls and regulates aviation within South Africa. It provides for the establishment of a South African Civil Aviation Authority (SA CAA) and independent Aviation Safety Investigation Board in compliance with Annexure 13 of the Chicago Convention. It gives effect to various conventions related to aircraft offences, civil aviation safety and security, and provides

for additional measures directed at more effective control of the safety and security of aircrafts, airports and matters connected thereto.

Although the Act is not directly relevant to the proposed development, it should be considered as the establishment of electricity distribution infrastructure (such as substations and power lines) may impact on aviation and air traffic safety if located directly within aircraft flight paths.

Air Traffic and Navigation Services Company Limited (ATNS) and the SACAA will be consulted throughout the BA process and the required approvals will be obtained, where necessary. It should however be noted that the proposed development is located within the Komsberg REDZ (formally gazetted on 16 February 2018 in GN 114) as well as one (1) of the Central Strategic Transmission Corridors (formally gazetted on 16 February 2018 in GN 113) and aligns with the development plans for the area.

4.1.18 Northern Cape Nature Conservation Act (Act No. 9 of 2009)

The Northern Cape Nature Conservation Act (Act No. 9 of 2009) and the Nature and Environmental Conservation Ordinance 19 of 1974 are of relevance to the Northern Cape Province. These are developed to protect both animal and plant species within the province. These may be species which are under threat or which are already considered to be endangered. The provincial environmental authorities are responsible for the issuing of permits in terms of this legislation.

Northern Cape Nature Conservation Act (Act No. 9 of 2009) provides for the sustainable utilisation of wild animals, aquatic biota and plants; provides for the implementation of the Convention on International Trade in Endangered Species of Wild Fauna and Flora; provides for offences and penalties for contravention of the Act; provides for the appointment of nature conservators to implement the provisions of the Act; and provides for the issuing of permits and other authorisations. Amongst other regulations, the following may apply to the current project:

- Boundary fences may not be altered in such a way as to prevent wild animals from freely moving onto or off of a property;
- Aquatic habitats may not be destroyed or damaged;
- The owner of the land upon which an invasive species is found (plant or animal) must take the necessary steps to eradicate or destroy such species.

The Act provides lists of protected species for the Province. According to Northern Cape Nature Conservation officials, a permit is required for the removal of any species on this list.

The proposed power line corridor traverses ESA 1 areas in the Northern Cape Province, and therefore the proposed development may impact negatively on these areas. A Terrestrial Ecology Impact Assessment (**Appendix 6F**) has however been conducted to explore how the proposed development may impact on biodiversity as protected by the Act. In addition, the relevant provincial environmental authority (namely the Northern Cape Department of Environment and Nature Conservation – NC DENC) as well as the DEFF's Biodiversity Conservation Department are being consulted throughout the BA process.

4.1.19 Nature and Environmental Conservation Ordinance 19 of 1974

Due to the fact that the Western Cape Province does not have its own environmental legislation, the province still operates under the Nature and Environmental Conservation Ordinance 19 of 1974. The Nature and Environmental Conservation Ordinance 19 of 1974 was developed to protect both animal and plant species within the province. These may be species which are under threat or which are already considered to be endangered. The provincial environmental authorities are responsible for the issuing of permits in terms of this legislation.

A Terrestrial Ecology Impact Assessment (**Appendix 6F**) has been conducted to explore how the proposed development may impact on biodiversity. In addition, the relevant provincial environmental authorities (namely the Western Cape Department of Environmental Affairs and Development Planning - WC DEADP and Northern Cape Department of Environment and Nature Conservation – NC DENC) as well as CapeNature and the DEFF's Biodiversity Conservation Department will be consulted throughout the BA process.

4.1.20 Western Cape Nature Conservation Laws Amendment Act, 2000

This statute provides for the amendment of various laws on nature conservation in order to transfer the administration of the provisions of those laws to the Western Cape Nature Conservation Board, which includes various regulations pertaining to wind animals, including avifauna.

4.1.21 Astronomy Geographic Advantage Act (Act No. 21 of 2007)

The Astronomy Geographic Advantage Act (Act No. 21 of 2007) provides for:

- The preservation and protection of areas that are uniquely suited for optical and radio astronomy; and
- Intergovernmental cooperation and public consultation on matters concerning nationally significant astronomy advantage areas and matters connected therewith.

Under Section 22(1) of the Act, the Minister has the authority to protect the radio frequency spectrum for astronomy observations within a core or central astronomy advantage area. As such, the Minister may under section 23(1) of the Act, declare that no person may undertake certain activities within a core or central Astronomy Advantage Area (AAA). These activities include the construction, expansion or operation; of any fixed radio frequency interference source, facilities for the generation, transmission or distribution of electricity, or any activity capable of causing radio frequency interference or which may detrimentally influence the astronomy and scientific endeavours.

In terms of section 7(1) and 7(2) of this Act, national government established the following AAAs:

- Central Karoo AAA (GN 198 of 2014) – proposed development falls outside this AAA
- Sutherland Central AAA – proposed development falls outside this AAA
- Northern Cape AAA (GN 115 of 2010) – proposed development falls outside of this AAA

Even though the proposed development falls outside the respective AAAs, the relevant authorities, including the Square Kilometre Array (SKA) and South African Large Telescope (SALT), will be consulted throughout the BA process. Any correspondence received from these authorities will be included throughout the BA process.

4.1.22 Renewable Energy Development Zones (REDZs) and Strategic Transmission Corridors

The Strategic Environmental Assessment (SEA) for Wind and Solar PV Energy in South Africa (CSIR, 2015) has identified eight (8) formally gazetted²⁵ REDZs that are of strategic importance for large-scale wind and solar PV development in terms of *Strategic Integrated Project 8: Green Energy in Support of the South African Economy*, as well as associated strategic transmission corridors²⁶, including the rollout of its supporting transmission and distribution infrastructure, in terms of *Strategic Integrated Project 10: Electricity Transmission and Distribution*.

- REDZs for large-scale wind and solar photovoltaic development;
- associated Strategic Transmission Corridors which support areas where long-term electricity grid will be developed;
- process of basic assessment to be followed and reduced decision-making timeframe for processing of applications for environmental authorisation in terms of NEMA; and
- acceptance of routes which have been pre-negotiated with all landowners as part of applications for environmental authorisations for power lines and substations.

Table 8: The Council for Scientific and Industrial Research (CSIR) identified the following five (5) strategic transmission corridors following the SEA

Corridor Name	Applicability of Corridor
Central Corridor	support areas where long-term electricity grid will be developed
Eastern Corridor	support areas where long-term electricity grid will be developed
International Corridor	support areas where long-term electricity grid will be developed
Northern Corridor	support areas where long-term electricity grid will be developed
Western Corridor	support areas where long-term electricity grid will be developed

²⁵ Formally gazetted on 16 February 2018 (GN 114)

²⁶ Formally gazetted on 16 February 2018 (GN 113)

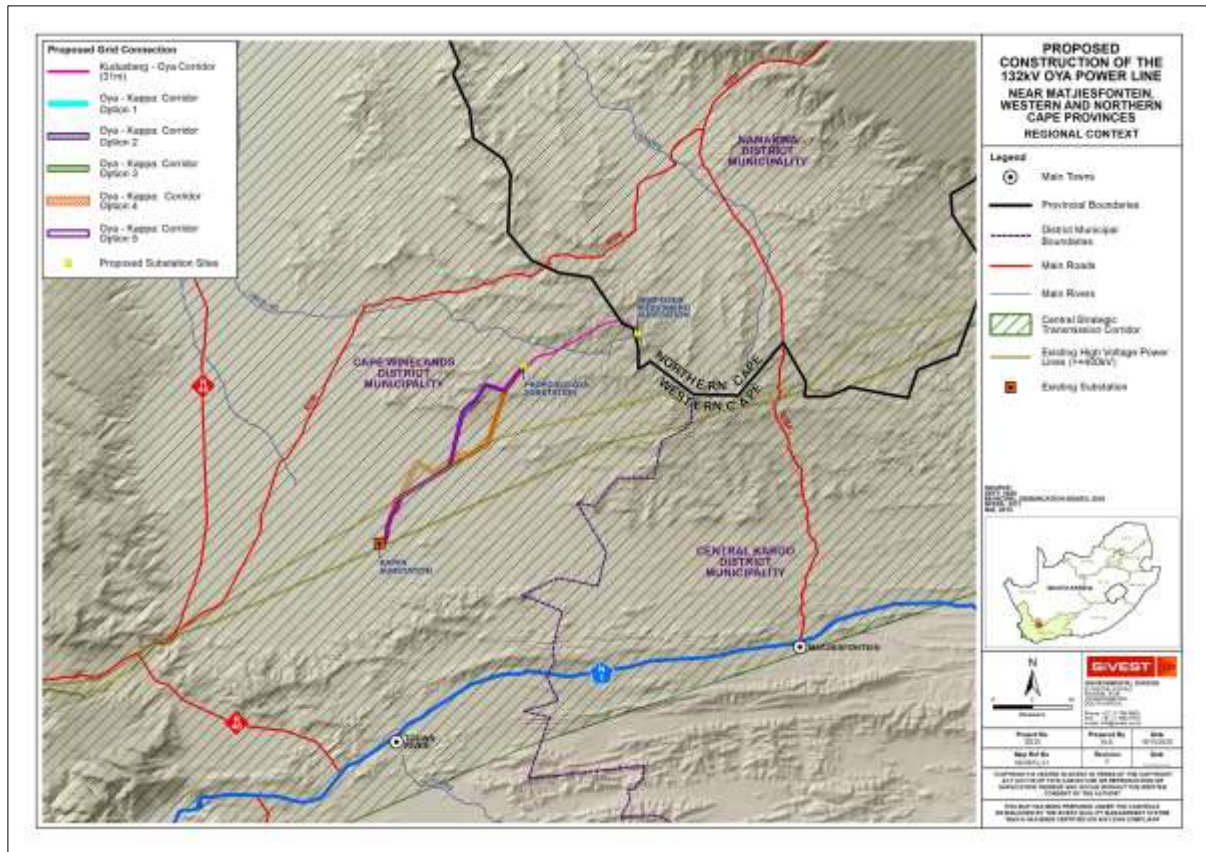


Figure 5: Formally gazetted strategic transmission corridors in South Africa and the proposed development location in relation to the strategic transmission corridors

As mentioned, and as can be seen from **Figure 5** above, the proposed development is located entirely within one (1) of the Central Strategic Transmission Corridors as defined and in terms of the procedures laid out in Government Notice No. 113 of 16 February 2018, namely the Central Corridor. This notice sets out procedures to be followed in applying for EAs for large scale electricity transmission and distribution development facilities and states that a BA process should be followed in respect of electricity transmission and distribution developments triggering Activity 9 of Listing Notice 2 (and any other listed activities) where the greater part of facility is located in a Strategic Transmission Corridor. Irrespective of the fact that the proposed grid connection development falls entirely within the Central Corridor, the proposed development would be subject to a BA process in terms of the NEMA, as amended, and the EIA Regulations, 2014 (as amended).

However, since the proposed development falls entirely within one (1) of the Strategic Transmission Corridors, it will contribute towards the requirement of renewable energy highlighted by the development of the REDZs and Strategic Transmission Corridors.

4.1.23 Additional Relevant Legislation

- Occupational Health and Safety Act (OHSA) (Act No. 85 of 1993);
- Road Safety Act (Act No. 93 of 1996);
- National Road Traffic Regulations Act (Act No. 22 of 2000);
- National Environmental Management: Air Quality Act (NEM:AQA) (Act No. 39 of 2004);
- National Environmental Management: Waste Act (NEM:WA) (Act No. 59 of 2008, as amended);
- The National Environmental Management: Biodiversity Act, 2014 (Alien and Invasive Species Regulations, 2014).

- Development Facilitation (Act No. 67 of 1995);
- National Ports Act (Act No. 12 of 2005)
- The Hazardous Substances Act (Act No. 15 of 1973);
- Water Services Act (Act No. 108 of 1998);
- Electricity Regulation Act (ERA) (Act No. 4 of 2006, as amended);
- Municipal Systems Act (Act No. 32 of 2000); and
- Mineral and Petroleum Resource Development Act (Act No. 28 of 2002, as amended).

4.2 Key Development Strategies and Guidelines

4.2.1 Integrated Development Plan (IDP)

An Integrated Development Plan (IDP) is defined in the Local Government: Municipal Systems Act (Act No. 32 of 2000), as an inclusive and strategic plan that:

- Links, integrates and co-ordinates plans and takes into account proposals for the development of the municipality;
- Aligns the resources and capacity of the municipality with the implementation of the plan
- Forms the policy framework on which annual budgets must be based; and
- Is compatible with national and provincial development plans and planning requirements binding on the municipality in terms of legislation.

Considering the nature and location of the proposed development, there is clear alignment with international, national, provincial and local (district and municipal) policy and legislation. The IDP for the Cape Winelands District Municipality is aligned with the National Development Plan, which has identified various central development challenges.

In September 2015 the world's governments signed a historic agreement to eradicate poverty, improve the living standards and well-being of all people, promote peace and more inclusive societies and to reverse the trend of environmental degradation. The 2030 Agenda for Sustainable Development commits to promoting development in a balanced way—economically, socially and environmentally—in all countries of the world, leaving no one behind and paying special attention to those people who are poorest or most excluded. It contains 17 Sustainable Development Goals with associated targets to assess progress.

The 17 goals, ranging from alleviating poverty and reducing inequality through job creation and economic growth, as well as ensuring access to affordable, reliable, sustainable and modern energy for all, are in many ways interrelated and cross-cutting in nature. The role of Cape Winelands District Municipality in the electricity distribution industry, including consideration of renewable energy, reticulation, and municipal debt and tariff structures will be critical in the above regards.

In his 2020 State of the Nation Address, President Cyril Rhamaposa announced government are taking the following measures to rapidly and significantly increase generation capacity outside of Eskom:

- A Section 34 Ministerial Determination will be issued shortly to give effect to the Integrated Resource Plan 2019, enabling the development of additional grid capacity from renewable energy, natural gas, hydro power, battery storage and coal.
- We will initiate the procurement of emergency power from projects that can deliver electricity into the grid within 3 to 12 months from approval.
- The National Energy Regulator will continue to register small scale distributed generation for own use of under 1 MW, for which no licence is required.

- The National Energy Regulator will ensure that all applications by commercial and industrial users to produce electricity for own use above 1MW are processed within the prescribed 120 days. It should be noted that there is now no limit to installed capacity above 1MW.
- We will open bid window 5 of the renewable energy IPP and work with producers to accelerate the completion of window 4 projects.
- We will negotiate supplementary power purchase agreements to acquire additional capacity from existing wind and solar plants.
- We will also put in place measures to enable municipalities in good financial standing to procure their own power from independent power producers.

The proposed development is located within the Witzenberg Local Municipality and greater Cape Winelands District Municipality of the Western Cape Province. On a municipal level, wide support is evident across the affected municipalities in the province as the proposed development supports the objectives of the Witzenberg Local Municipality's IDP (2017-2022), which identifies renewable energy as a key economic sector. The Witzenberg Local Municipality's IDP promotes the creation of an enabling environment to attract investment and support local economy. In addition, the main relevant national and local policies, including its associated objectives, which form part of the Witzenberg Local Municipality's IDP includes the following (Witzenberg Local Municipality IDP, 2017):

- Sustainable provision and maintenance of basic infrastructure;
- Provide for the needs of informal settlements through improved services;
- Support institutional transformation and development;
- Ensure financial viability;
- To maintain and strengthen relations with international and inter-governmental partners as well as the local community through the creation of participative structures;
- Provide and maintain facilities that make citizens feel like home;
- Support the poor and vulnerable through programmes and policy;
- Create an enabling environment to attract investment; and
- Support local economy.

The Cape Winelands District Municipality's IDP (2017) also promotes renewable energy development and states the following: *'The District Plans to move to less carbon-intensive electricity production through procuring at least 20 000MW of renewable energy, increased hydro imports from the region and increased demand-side measures, including solar water heating'*.

The proposed development is located within the Karoo Hooglands Local Municipality and greater Namakwa District Municipality of the Northern Cape Province. On a municipal planning level, the proposed project supports the objectives of the Karoo Hoogland Local Municipality's Integrated Development Plan (IDP) (2017-2022), which identify renewable energy as a key economic sector. The Karoo Hoogland's IDP calls for economic interventions in sector development (agricultural, tourism and renewable energy). In addition, the mission of the municipality's IDP is to provide local leadership on environmental sustainability and climate change response. The IDP further states that the municipality must investigate opportunities for renewable energy development. Key policy objectives of the Karoo Hoogland's IDP include the following:

- Poverty relief through effective basic service delivery and job creation
- Assist with economic interventions in sector development (agricultural, tourism and renewable energy)
- Facilitate education, literacy, skills development and capacity building within the local economy
- Promote business and investment attraction and retention
- Enhance sustainable service delivery through infrastructure development.

The IDP of the Namakwa District Municipality (2017-2022) states that *"Renewable energy is recently one (1) of the cornerstones of the economy of the District and there needs to be engagement on*

National level to ensure that the District benefit from this resource". Furthermore, Output 10 from the IDP indicates:

"...To ensure that Environmental assets and natural resources are well protected and continually enhanced, the key partners will focus on the following four key outputs and related sub-outputs:

- *Enhanced quality and quantity of water resources*
- *Reduced greenhouse gas emissions, climate change & improved air/atmospheric quality*
- *Sustainable environmental management*
- *Protected biodiversity..."*

The proposed development is therefore aligned with the vision and goals of the respective Local and District Municipalities. It will also stimulate the creation of employment which is much needed in the municipal areas. It will therefore be supportive of the IDP's objective of creating more job opportunities.

Upon reviewing the spatial planning component, the Cape Winelands and Namakwa District Municipality, as well as the Witzenberg and Karoo Hoogland Local Municipality's respective IDPs do not suggest any potential conflicts between the planned spatial development visions and the proposed development. In addition, the site where the proposed development will be constructed is not located near any settlement or significant tourist attraction that might be sensitive to the environmental effects of the proposed development. The nearest town is the town of Matjiesfontein which is situated approximately 50km north-west of the application site.

After considering the reviewed documentation, the proposed development is aligned with national, provincial and local objectives, plans and strategies regarding socio-economic development of the areas under analysis. There were no fatal flaws or contraventions identified as all spheres of government prioritise the development of renewable energy projects. The proposed development fits well with the plans to diversify the provincial, district and local economies through investment in renewable energy projects.

The proposed project does not conflict with any of the identified developmental priorities of the local governments in question and is aligned with the identified means to stimulate the local economy.

Policy decisions taken in the next decade will largely determine the dimension of the impact of climate change. Local government is central to implementation and service delivery, and thus needs to pursue adequate mitigation and adaptation strategies which should include participation from the public sector, the private sector and non-governmental organisations (NGOs). Therefore, it is evident that the proposed development is aligned with the goals of the municipal IDPs in the study area.

4.2.2 Draft Integrated Energy Plan (IEP) for the Republic of South Africa, 2016

The Draft Integrated Energy Plan (IEP), developed by the Department of Energy (DoE), is anchored in the National Energy Act (Act No. 34 of 2008). The purpose of the Draft IEP is to provide a roadmap of the future energy landscape for South Africa which guides future energy infrastructure investments and policy development, while:

- Maintaining control over economic costs;
- Serving national imperatives such as job creation and poverty alleviation; and
- Minimising the adverse impacts of the energy sector on the environment.

The Draft IEP takes into consideration the crucial role that energy plays in the entire economy and is informed by the output of analyses founded on a solid fact base. It is a multi-faceted, long-term energy framework which has multiple objectives, some of which include:

- To guide the development of energy policies and, where relevant, set the framework for regulations in the energy sector;
- To guide the selection of appropriate technologies to meet energy demand (i.e. the types and sizes of new power plants and refineries to be built and the prices that should be charged for fuels);
- To guide investment in and the development of energy infrastructure in South Africa; and
- To propose alternative energy strategies which are informed by testing the potential impacts of various factors such as proposed policies, introduction of new technologies, and effects of exogenous macro-economic factors.

The Draft IEP considers the national supply and demand balance and proposes alternative capacity expansion plans based on varying sets of assumptions and constraints. While infrastructural matters are briefly discussed, the Draft IEP does not explicitly consider supply and demand at specific geographical locations within the country, nor does it take into account infrastructure bottlenecks at specific locations. These are, or will be, covered in detail as follows:

- Electricity infrastructure (transmission and distribution) is dealt with in other plans and the Integrated Resource Plan (IRP) should assess these in detail, taking into consideration the grid planning currently conducted by Eskom;
- Electricity supply is dealt with in the IRP;
- Liquid fuels will be dealt with in the 20-Year Liquid Fuel Infrastructure Roadmap which will cover logistical matters relating to pipelines and storage facilities for petroleum products; and
- The Gas Utilisation Master Plan (GUMP) will take into consideration the bottlenecks and capacity constraints of the current natural gas infrastructure. All the above will inform the integrated energy planning process and will enable overall enhancement through ongoing periodic iterations to ensure alignment.

4.2.3 *Integrated Resource Plan (IRP), 2019*

South Africa's National Development Plan (NDP) 2030 defines a desired destination where inequality and unemployment are reduced and poverty is eliminated so that all South Africans can attain a decent standard of living. Electricity is one (1) of the core elements of a decent standard of living. The NDP envisages that, by 2030, South Africa will have an energy sector that provides reliable and efficient energy service at competitive rates, that is socially equitable through expanded access to energy at affordable tariffs and that is environmentally sustainable through reduced emissions and pollution. In formulating its vision for the energy sector, the NDP took as a point of departure the Integrated Resource Plan (IRP) (IRP, 2019).

The Integrated Resource Plan (IRP) was created in order to plan for projected national electricity demand and is an electricity infrastructure development plan based on least-cost electricity supply and demand balance, taking into account security of supply and the environment (minimise negative emissions and water usage) (IRP, 2019).

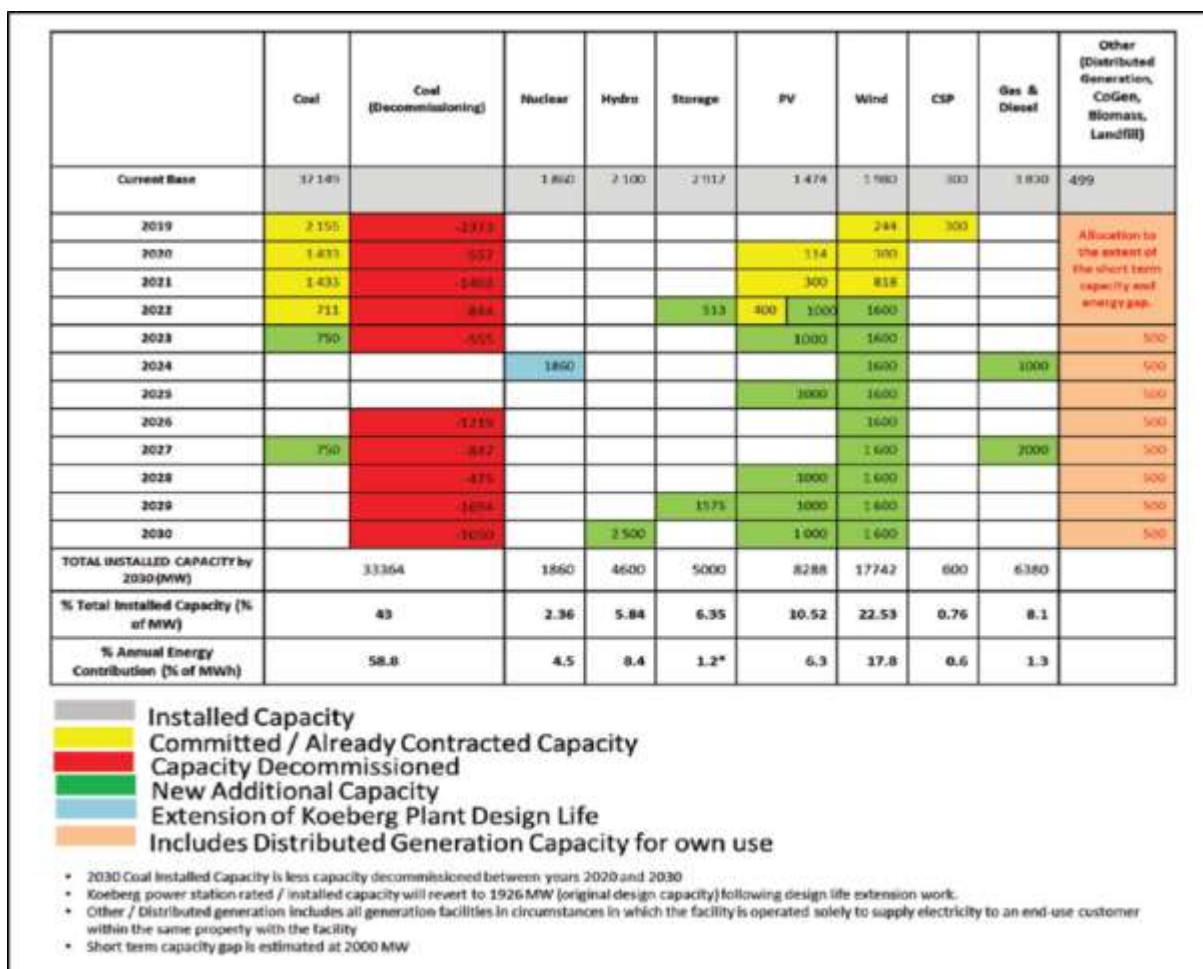


Figure 6: Proposed updated generation plan for the period ending 2030 (IRP, 2019)

The updated IRP 2019 recommends that 10.5% of installed generation capacity should be from solar PV energy by 2030, as indicated in **Figure 6** above.

South Africa continues to pursue a diversified energy mix that reduces reliance on a single or a few primary energy sources. The extent of decommissioning of the existing coal fleet due to end of design life, could provide space for a completely different energy mix relative to the current mix. In the period prior to 2030, the system requirements are largely for incremental capacity addition (modular) and flexible technology, to complement the existing installed inflexible capacity.

In the long run and taking into account the policy of a diversified energy mix, the annual build limits will have to be reviewed in line with demand and supply requirement. As such, the current annual build limits on renewables (wind and PV) will need to be retained pending the finalisation of a just transition plan (IRP, 2019).

4.2.4 Risk Mitigation Independent Power Producer Procurement Program (RMIPPPP)

The object of this section is to detail the recently launched RMIPPPP. In accordance with the ministerial determination as gazetted on the 7th of July 2020, the Minister of the Department of Mineral Resources and Energy (DMRE), in consultation with the National Energy Regulator of South Africa (NERSA) determined that the DMRE is to procure 2000MW of new generation capacity from a range of energy source technologies. The RMIPPPP has been designed by the Department in order to fulfil the

Minister's directive and the short-term supply gap as detailed in the IRP 2019. The RMIPPPP serves as an "emergency" power generation programme for accelerated assistance to the national grid amid electricity supply constraints.

On the 23 August 2020 the DMRE issued a Request for Proposal (RFP) (Tender no: DMRE001/2020/21) for the emergency procurement of 2000MW of electricity. Due to the emergency nature of the RMIPPPP, the objective is to procure energy from projects that are near ready and connect to the grid quickly. The RMIPPPP will allow for a phased grid connection, incentivising early power with a long stop date for the last permissible commercial operation dates before end June 2022.

Key Points of the RMPPP as follows:

- Technology agnostic (Renewable and non-renewable)
- Must supply energy between 5h00 – 21h30
- Must be flexible and able scale up and down based on system requirements
- Minimum project size of 50MW and maximum project size of 450MW

The connection timelines of the RMIPPPP do not allow for any deep strengthening of the grid and the qualification criteria facilitates projects where grid capacity is available and do not require any deep grid works. The key timelines associated with the RMIPPPP are as follows:

- Bid submissions: Tuesday 24 November 2020
- Preferred bidder announcement: 15 December 2020 (flexible based on IPPO)
- Financial Close (FC) must be achieved in 4 months (~Middle to end April 2021)
- Plants must be fully operation by June 2022, (early connection incentivized)

A successful bidder will be awarded a PPA subject to signature by the Regulator, namely Eskom of up to 20 years.

This procurement is crucial for South Africa in order to reduce the risk of load-shedding.

4.2.5 Renewable Energy Independent Power Producer Procurement Program (REIPPPP)

The objective of this section is to provide an overview of the processes in the country and within Eskom relating to Independent Power Producers (IPPs). It is important that certain enabling policies, rules and regulations are in place to provide certainty and transparency in the introduction of IPPs.

In August 2009, the DoE gazetted the Electricity Regulations on New Generation Capacity under the ERA. The New Generation Regulations establish rules and guidelines that are applicable to the undertaking of an IPP Bid Programme and the procurement of an IPP for new generation capacity. They also facilitate the fair treatment and non-discrimination between IPPs and the buyer of the energy. In terms of the New Generation Regulations, the IRP developed by the DoE sets out the new generation capacity requirement per technology, taking energy efficiency and the demand-side management projects into account. This required, new generation capacity must be met through the technologies and projects listed in the IRP and all IPP procurement programmes will be executed in accordance with the specified capacities and technologies listed in the IRP.

A decision that additional capacity be provided by an IPP must be made with the concurrence of the Minister of Finance. Once such a decision is made, a procurement process needs to be embarked upon to procure that capacity in a fair, equitable and transparent process.

The New Generation Regulations set out the procurement process. The stages within a bid programme are prescribed as follows:

- i. Request for Qualifications
- ii. Request for Proposals
- iii. Negotiation with the preferred bidder(s).

A successful bidder will be awarded a PPA subject to signature by the Regulator, namely Eskom.

It should also be noted that the Minister of Mineral Resources and Energy has recently welcomed the concurrence by the NERSA to the second Section 34 Ministerial Determination issued in February 2020. This is another milestone that gives effect to commitments made by President Cyril Ramaphosa in his 2020 State of the Nation Address (SONA) to increase generation capacity and ensure security of energy supply to society rapidly and significantly. The Section 34 Determination enables the Department to undertake procurement of additional electricity capacity in line with the Integrated Resource Plan (IRP 2019). This will open-up various Bid Windows (BW), including BW 5 of renewable energy. 6 800MW of capacity is determined to be generated from renewable energy sources (PV and Wind), 513MW from storage, 3 000MW from gas and 1 500MW from coal. This will enable the development of an additional 11 813MW of power in total from the year 2022. This is in addition to the 2 000MW already being procured under the RMIPPP (as per media statement released 10 September 2020²³).

4.2.6 Department of Energy (DoE) White Paper on Renewable Energy, 2003

The DoE gazetted its White Paper on Renewable Energy in 2003 and introduced it as a ‘*policy that envisages a range of measures to bring about integration of renewable energies into the mainstream energy economy.*’ At that time, the national target was fixed at 10 000GWh (0.8Mtoe) renewable energy contribution to final energy consumption by 2013. The White Paper proposed that this would be produced mainly from biomass, wind, solar and small-scale hydropower. It went on to recommend that this renewable energy should to be utilised for power generation and non-electric technologies such as solar water heating and biofuels. Since the White Paper was gazetted, South Africa’s primary and secondary energy requirements have remained heavily fossil-fuel dependent, both in terms of indigenous coal production and use, as well as the use of imported oil resources. Alongside this, the projected electricity demand of the country has led the National utility Eskom, to embark upon an intensive build programme to secure South Africa’s longer-term energy needs, together with an adequate reserve margin.

4.2.7 The Northern Cape Provincial Spatial Development Framework (SDF)

Energy is one (1) of the primary objectives addressed in the SDF. Their energy objectives include promoting the development of renewable energy supply schemes. Large-scale renewable energy supply schemes are strategically important for increasing the diversity of domestic energy supplies and avoiding energy imports while minimising detrimental environmental impacts. The development of the energy sector holds huge benefit for the Northern Cape which would have significant multipliers in the local economy. It is important that innovative planning is undertaken to provide the necessary infrastructure and associated amenities to accommodate the industry in an efficient manner. Therefore, in order to ensure the sustainability of the current and future economic sectors and to maximise synergies, it is imperative that industrial development be undertaken in a manner that promotes the principles of environmental integrity, human wellbeing and economic efficiency.

4.2.8 The Western Cape Provincial Spatial Development Framework (SDF)

In terms of the Western Cape Provincial Spatial Development Framework (WCSDf, 2014), Policy R4 (recycle and recover waste, deliver clean sources of energy to urban consumers, shift from private to public transport, and adapt to and mitigate against climate change) highlights the need support of Independent Power Producers, and sustainable energy producers to assist in a reducing the power shortage and mitigating against climate change. One of many economic sectors targeted for growth is renewable energy. Further to this, regional economic infrastructure targeted by the Western cape, includes the Development of the renewable sector. Western Cape's Green Economy Strategic Framework is centered on investment in new and expanding market opportunities that support a low carbon, resource efficient and socially inclusive economic pathway, revolving around (amongst others), expanding the renewable sector through off grid investments, Power Purchase Agreements and lobbying. As such, the proposed development falls in line with the WCSDf.

4.2.9 Cape Winelands District Municipality Spatial Development Framework (SDF) (2020)

According to the Cape Winelands District Municipality SDF (2020), electrical distribution infrastructure is well established, has good coverage, and is in a reasonable condition. Current deficits and uncertainties lie in the generation and sourcing of electricity capacity. The provincial energy focus is on lowering carbon emissions and local generation (e.g. renewable and greater use of gas).

In addition, the SDF states that it is essential that the transitioning to a green economy is prioritised. A green economy is defined as an economy that aims at reducing environmental risks and ecological scarcities that aims for sustainable development without degrading the environment. The Western Cape Government has realised the potential benefits of a green economy and started an initiative called "Green is Smart" (Western Cape Government, 2013a). This is a green economy strategy framework and aims to optimise green economic opportunities and enhancing environmental performance in the Western Cape. The framework aims for the Western Cape to become the lowest carbon intensive province and a leading green economic hub of the African continent, through the following five drivers: "smart living and working", "smart mobility", "smart eco-systems", "smart agri-production", and "smart enterprise" (Western Cape Government, 2013a) (Van Niekerk, Brent and Musango 2013) (Cape Winelands District Municipality SDF, 2020).

Based on the information above, it is evident that the proposed development fits within the plans to lowering carbon emissions and local generation through renewable energy developments, as well as transitioning to a "green" economy.

4.2.10 Namakwa District Municipality Integrated Development Plan (IDP) (2017)

The IDP states that "Renewable energy is recently one (1) of the cornerstones of the economy of the District and there needs to be engagement on National level to ensure that the District benefit from this resource." Furthermore, Output 10 from the IDP indicates:

"...To ensure that Environmental assets and natural resources are well protected and continually enhanced, the key partners will focus on the following four key outputs and related sub-outputs:

- *Enhanced quality and quantity of water resources*
- *Reduced greenhouse gas emissions, climate change & improved air/atmospheric quality*
- *Sustainable environmental management*

- *Protected biodiversity...*

4.2.11 *Witzenberg Municipal Spatial Development Framework (SDF) (2020)*

According to the Witzenberg Municipal Spatial Development Framework (MSDF) (2020), the Witzenberg Municipality forms part of the Komsberg REDZ. Any projects or renewable energy developments in the municipal area should preferably be located inside of this boundary. In addition, a Small-scale Embedded Generation (SSEG) plan is under development, to support the management of renewable energy production in the municipal area (Witzenberg Municipal Spatial Development Framework, 2020).

Due to the fact that the proposed development falls within the Witzenberg Local Municipality, as well as the Komsberg REDZ, it aligns with the recommendation of the municipality that any renewable energy developments in the municipal area should preferably be located inside of this boundary. In addition, the proposed development will contribute renewable energy production in the municipal area.

4.2.12 *Karoo Hoogland Local Municipality Integrated Development Plan (IDP) (2017-2022)*

Karoo Hoogland Local Municipality's IDP (2017-2022) identifies the renewable energy as a key economic sector. The IDP calls for economic interventions in sector development, namely agricultural, tourism and renewable energy. In addition, the mission of the municipality's IDP is to provide local leadership on environmental sustainability and climate change response. The IDP further states that the municipality must investigate opportunities for renewable energy development. The key policy objectives of the Karoo Hoogland's IDP include the following:

- Poverty relief through effective basic service delivery and job creation
- Assist with economic interventions in sector development (agricultural, tourism and renewable energy)
- Facilitate education, literacy, skills development and capacity building within the local economy
- Promote business and investment attraction and retention
- Enhance sustainable service delivery through infrastructure development.

4.2.13 *National Infrastructure Plan (2012)*

The National Infrastructure Plan (2012) supports green energy initiatives on a national scale through a diverse range of clean energy options as outlined in the Integrated Resource Plan IRP2010 through the Strategic Integrated Project (SIP 8). Electricity transmission and distribution for all is supported by SIP 10, which seeks to expand the transmission and distribution network to address historical imbalances, provide access to electricity for all and support economic development. As such, the proposed development falls in line with the National Infrastructure Plan.

4.2.14 *Convention on Biodiversity (CBD)*

South Africa became a signatory to the United Nations Convention on Biological Diversity (CBD) in 1993, which was ratified in 1995. The CBD requires signatory states to implement objectives of the Convention, which are the conservation of biodiversity; the sustainable use of biological resources and

the fair and equitable sharing of benefits arising from the use of genetic resources. According to Article 14(a) of the CBD, each Contracting Party, as far as possible and as appropriate, must introduce appropriate procedures, such as environmental impact assessments of its proposed projects that are likely to have significant adverse effects on biological diversity, to avoid or minimize these effects and, where appropriate, to allow for public participation in such procedures.

4.2.15 National Veld and Forest Fire Act (Act No. 101 of 1998)

Provides requirements for veldfire prevention through firebreaks and required measures for fire-fighting. Chapter 4 of the Act places a duty on landowners to prepare and maintain firebreaks. Chapter 5 of the Act places a duty on all landowners to acquire equipment and have available personnel to fight fires.

5 PROJECT NEED AND DESIRABILITY

It is an important requirement in this BA Process to review the need and desirability of the proposed development. Guidelines on Need and Desirability were published in the Government Gazette of 20 October 2014. These guidelines list specific questions to determine need and desirability of proposed developments. This checklist is a useful tool in addressing specific questions relating to the need and desirability of a proposed development and assists in explaining that need and desirability at the provincial and local context. Need and desirability answer the question of whether the activity is being proposed at the right time and in the right place. **Table 9** includes a list of questions based on the DEFF's Guideline to determine the need and desirability of the proposed development. It should be noted this table was informed by the outcomes of the BA Process.

One (1) of the primary reasons for promoting renewable energy developments is the desire to make South Africa compliant with international treaties regarding climate-change effects and reduce our risk of a climate crises and frequency and intensity of severe weather events

Renewable energy options are a sustainable energy supply option that can significantly reduce reliance on fossil fuels. Other advantages include employment creation, proximity to point-of-use, minimal demand for water and less reliance on fossil fuel based sources of energy. Greater use of renewable energy would also reduce South Africa's economic vulnerability to the variable costs of imported fuels. International and local communities are increasingly trying to find ways to shift economies towards greater reliance on renewable energy. Greater uptake of renewable energy would furthermore reduce the global risk of climate change, one (1) of the factors taken into account in designing the conservation network in South Africa.

Since the proposed development aims at feeding the electricity generated by the proposed Oya Energy Facility as well as potentially the nearby developments into the national grid, it supports the objectives of the Witzenberg Local Municipality's IDP (2017-2022) on a municipal planning level, as it identifies renewable energy as a key economic sector. The Witzenberg Local Municipality's IDP promotes the creation of an enabling environment to attract investment and support local economy. The Karoo Hoogland Local Municipality's Integrated Development Plan (IDP) (2017-2022) identifies renewable energy as a key economic sector and calls for economic interventions in sector development (namely agricultural, tourism and renewable energy). The IDP further states that the municipality must investigate opportunities for renewable energy development. On a District level, the Cape Winelands District Municipality's IDP (2017-2022) also promotes renewable energy development as it states '*The District Plans to move to less carbon-intensive electricity production through procuring at least 20*

000MW of renewable energy, increased hydro imports from the region and increased demand-side measures, including solar water heating'. The IDP of the Namakwa District Municipality (2017-2022) states that "Renewable energy is recently one (1) of the cornerstones of the economy of the District and there needs to be engagement on National level to ensure that the District benefit from this resource". Furthermore, Output 10 from the IDP indicates: "...To ensure that Environmental assets and natural resources are well protected and continually enhanced, the key partners will focus on four (4) key outputs and related sub-outputs", among which include "Reduced greenhouse gas emissions, climate change & improved air / atmospheric quality". The proposed development is therefore aligned with the vision and goals of the respective Local and District Municipalities. It will also stimulate the creation of employment which is much needed in the municipal areas. It will therefore be supportive of the IDP's objective of creating more job opportunities.

It should be noted that the South African government is currently procuring 2000MW of **ANY** technology that can deliver base load energy under the recently launched RMIPPPP²⁷. Due to strict testing requirements that a project developer must pass before commercial operations date, renewable energy can only deliver the required base load energy **IF** coupled with fossil fuel. Should the project developer "bid" the proposed development and not be successful in the RMIPPPP or any other government run programme, it is highly likely that the South African government will procure generation from fossil fuel instead of a hybrid energy facility such as the Oya Energy Facility. As mentioned, the objective of the proposed development is to feed electricity generated by the Oya Energy Facility as well as potentially the nearby developments into the national grid and thus it can commit to feeding energy generated from clean, green energy (namely solar and wind) into the national grid. This allows the development to conform with the move towards a greener and cleaner energy generation mix in South Africa.

The proposed development also supports the objectives of the RMIPPPP, which serves as an "emergency" power generation programme for accelerated assistance to the national grid amid electricity supply constraints. As mentioned, the DMRE issued a RFP for the emergency procurment of 2000MW of electricity. Due to the emergency nature of the RMIPPPP, the objective is to procure energy from projects that are near ready and can connect to the grid quickly. The proposed development is deemed to meet these requirements and can also reduce the risk of load-shedding. Grid capacity is also available and no deep grid works are required, which are beneficial for the connection timelines of the RMIPPPP.

In addition, as mentioned, the Minister of Mineral Resources and Energy has recently welcomed the concurrence by the NERSA to the second Section 34 Ministerial Determination, which enables the Department to undertake procurement of additional electricity capacity in line with the IRP (2019). 6 800MW of capacity is determined to be generated from renewable energy sources (PV and Wind), 513MW from storage and 3 000MW from gas²³. The proposed development will be able to contribute to this diverse electricity requirement and will thus actively contribute to the commitments made to increase generation capacity, and ensure security of energy supply to society rapidly and significantly.

Table 9: The guideline on the Need and Desirability's list of questions to determine the 'Need and Desirability' of a proposed development

NEED	
Question	Response
1. How will this development (and its separate elements/aspects) impact on the ecological integrity of the area)?	

²⁷ In accordance with the ministerial determination as gazetted Government Gazette No. 43509 on the 7th of July 2020

NEED	
Question	Response
<p>1.1. How were the following ecological integrity considerations taken into account?:</p> <p>1.1.1. Threatened Ecosystems,</p> <p>1.1.2. Sensitive, vulnerable, highly dynamic or stressed ecosystems, such as coastal shores, estuaries, wetlands, and similar systems require specific attention in management and planning procedures, especially where they are subject to significant human resource usage and development pressure,</p> <p>1.1.3. Critical Biodiversity Areas ("CBAs") and Ecological Support Areas ("ESAs"),</p> <p>1.1.4. Conservation targets,</p> <p>1.1.5. Ecological drivers of the ecosystem,</p> <p>1.1.6. Environmental Management Framework,</p> <p>1.1.7. Spatial Development Framework, and</p> <p>1.1.8. Global and international responsibilities relating to the environment (e.g. RAMSAR sites, Climate Change, etc.).</p>	<p>The environmental sensitivities present on site were assessed in the Terrestrial Ecology Impact Assessment, Avifauna Impact Assessment and Surface Water Impact Assessment undertaken as part of this BA Process. The project development footprint avoids all protected areas.</p> <p>The mitigation hierarchy has been applied to inform the findings of these assessments. All specialists are of the view that the proposed development should be authorised.</p> <p>The relevant SDFs and IDPs were considered in the Socio-Economic Impact Assessment and described in section 4.2.</p> <p>An environmental sensitivity map based on the input obtained from the various specialist studies has been included in this DBAR (refer to Appendix 5).</p>
<p>1.2. How will this development disturb or enhance ecosystems and/or result in the loss or protection of biological diversity? What measures were explored to firstly avoid these negative impacts, and where these negative impacts could not be avoided altogether, what measures were explored to minimise and remedy (including offsetting) the impacts? What measures were explored to enhance positive impacts?</p>	<p>The environmental sensitivities present on site were assessed within the Terrestrial Ecology Impact Assessment, Avifauna Impact Assessment and Surface Water Impact Assessment undertaken as part of this BA Process. The specialist identified all sensitive / "no-go" areas that would need to be avoided by the proposed development, as well as how to suitably develop within these areas so that the integrity of the areas is maintained.</p> <p>The mitigation hierarchy of avoidance, reduction and improved management have been applied to inform the findings. Sensitive areas were mapped with appropriate "no-go" buffers recommended. The infrastructure will avoid the respective buffers as recommended. The Specialists are of the view that the proposed development should be authorized with no offsets required.</p> <p>An environmental sensitivity map based on the input obtained from the various specialist studies has been included in this DBAR (refer to Appendix 5).</p>
<p>1.3. How will this development pollute and/or degrade the biophysical environment? What</p>	<p>The project study area consists of natural habitat within a largely rural area. This is within an area</p>

NEED	
Question	Response
<p>measures were explored to firstly avoid these impacts, and where impacts could not be avoided altogether, what measures were explored to minimise and remedy (including offsetting) the impacts? What measures were explored to enhance positive impacts?</p>	<p>where portions of the natural habitat have been assessed as having potential conservation value, although this project site falls outside of the NPAES entirely and are therefore not earmarked for future conservation. Currently, the rates of transformation within the vegetation in this area is low. The regional vegetation types that occur on-site are listed as Least Threatened in the National List of Ecosystems that are Threatened and need of protection (GN 1002 of 2011), published under the National Environmental Management: Biodiversity Act (Act No. 10, 2004). However, it is important to emphasize that the spatial scale of transformation of natural habitats on site due to the proposed project is negligible in area compared to the total area of vegetation types concerned, as well as any CBAs.</p> <p>This proposed development has the potential to impact on the terrestrial and aquatic ecology of the area, this includes impacts on the natural vegetation, biodiversity (including avifauna), sensitive habitats (such as watercourses) and ecosystem function. Environmental sensitivities present within the development footprint (including CBAs and ESAs) were assessed by various specialists. This included Terrestrial Ecology, Surface Water and Avifauna. From a terrestrial ecology perspective, it is unlikely that the proposed project will have an unacceptable impact on the natural environment or any ecological features of concern. Based on the analysis provided, the overall impact will have LOW significance, the only residual impact of medium significance being on loss of vegetation due to clearing for construction. The specialist however concluded that the project should be authorised. From a surface water perspective, overall, all impacts were assessed to be low, post-implementation of mitigation measures. From an avifauna perspective, the proposed development will have some impacts which will range from Medium to Low after the implementation of the appropriate mitigation measures. From an agricultural impact point of view, the proposed development will not have an unacceptable negative impact on the agricultural production capability of the site. This is</p>

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	<p>substantiated by the facts that the land is of very low agricultural potential, the amount of agricultural land loss is insignificant, and that the proposed development poses a low risk in terms of causing soil degradation.</p> <p>As mentioned above, it is important to emphasize that the spatial scale of transformation of natural habitats on-site due to the proposed project is negligible in area compared to the total area of vegetation types concerned, as well as any CBAs. There will be residual impacts, primarily on natural habitat, but the amount of habitat that will be lost to the project is insignificant compared to the area in hectares of the regional vegetation type that occurs on site and therefore the residual impacts are considered acceptable, on condition local sensitivities of biodiversity importance are avoided.</p> <p>Assessment of the terrestrial ecological impacts is incorporated in Appendix 6F of this report. In addition, the surface water and avifauna assessments are provided in Appendix 6E, and Appendix 6B respectively. Measures to avoid, remedy, mitigate and manage impacts have been included in the EMPr (Appendix 8), which forms part of the BA report.</p>
<p>1.4. What waste will be generated by this development? What measures were explored to firstly avoid waste, and where waste could not be avoided altogether; what measures were explored to minimise, reuse and/or recycle the waste? What measures have been explored to safely treat and/or dispose of unavoidable waste?</p>	<p>It is not anticipated that a significant amount of waste will be generated during the operational phase. Construction related waste will be managed by a contractor and recycled, reduced, or disposed at a registered landfill.</p> <p>The EMPr includes measures to avoid, remedy, mitigate and manage impacts with regards to waste and waste management. The EMPr is attached to the BA report (Appendix 8).</p>
<p>1.5. How will this development disturb or enhance landscapes and/or sites that constitute the nation's cultural heritage? What measures were explored to firstly avoid these impacts, and where impacts could not be avoided altogether, what measures were explored to minimise and remedy (including offsetting) the impacts? What measures were explored to enhance positive impacts?</p>	<p>A HIA (Appendix 6C), including Palaeontology, Cultural Landscapes and Archaeology, was undertaken as part of the BA process for this proposed development. The overall findings of the HIA indicated that the lithic material identified is of low significance, and even though the resources may be destroyed during the construction, the impact is inconsequential for the majority of the heritage resources identified during the archaeological and palaeontological assessments conducted for this project. In</p>

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	<p>addition, no significant fossils were identified during the field analysis.</p> <p>Ultimately, the proposed development is unlikely to have a negative impact on significant heritage resources on condition that the proposed mitigation measures including buffer areas and 'no-go' areas are implemented. It is also unlikely that the proposed development will negatively impact on significant archaeological heritage as the footprint of the power line and substation infrastructure is limited. Although the Abrahamskraal formation is highly sensitive, as it could contain the Tapinocephalus Assemblage Zone, fossils in this area are rare and unpredictably located. The chance of finding a fossil in the area during development is low, but possible. For this reason, a Chance Fossil Find Procedure has been incorporated into the EMPr (Appendix 8). Therefore, as far as the palaeontology is concerned, the project may proceed.</p> <p>It must be noted that the site is located in an area earmarked for renewable energy development with associated overhead power line and substation infrastructure (REDZ and Strategic Transmission Corridors) and therefore changes to the current cultural landscape are anticipated. Appropriate buffer areas were recommended and have been implemented accordingly. The appropriate mitigation measures and Chance Find Procedure has been included in the EMPr (Appendix 8).</p>
<p>1.6. How will this development use and/or impact on non-renewable natural resources? What measures were explored to ensure responsible and equitable use of the resources? How have the consequences of the depletion of the non-renewable natural resources been considered? What measures were explored to firstly avoid these impacts, and where impacts could not be avoided altogether, what measures were explored to minimise and remedy (including offsetting) the impacts? What measures were explored to enhance positive impacts?</p>	<p>This proposed development requires water during the construction phase and minimal water is required during the operational phase.</p> <p>Appropriate buffer zones were recommended around surface water features to minimize impacts. These buffer zones have been implemented accordingly.</p>

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<p>1.7. How will this development use and/or impact on renewable natural resources and the ecosystem of which they are part? Will the use of the resources and/or impact on the ecosystem jeopardise the integrity of the resource and/or system taking into account carrying capacity restrictions, limits of acceptable change, and thresholds? What measures were explored to firstly avoid the use of resources, or if avoidance is not possible, to minimise the use of resources? What measures were taken to ensure responsible and equitable use of the resources? What measures were explored to enhance positive impacts?</p> <p>1.7.1. Does the proposed development exacerbate the increased dependency on increased use of resources to maintain economic growth or does it reduce resource dependency (i.e. de-materialised growth)? (note: sustainability requires that settlements reduce their ecological footprint by using less material and energy demands and reduce the amount of waste they generate, without compromising their quest to improve their quality of life)</p> <p>1.7.2. Does the proposed use of natural resources constitute the best use thereof? Is the use justifiable when considering intra- and intergenerational equity, and are there more important priorities for which the resources should be used (i.e. what are the opportunity costs of using these resources of the proposed development alternative?)</p> <p>1.7.3. Do the proposed location, type and scale of development promote a reduced dependency on resources?</p>	<p>The proposed development aims to assist in feeding the electricity generated by the proposed Oya Energy Facility (part of separate on-going EIA process with DEFF Ref No.: 14/12/16/3/3/2/2009) as well as potentially the nearby developments into the national grid. The Oya Energy Facility harnesses the bulk of the energy generation from solar energy with supporting ancillary infrastructure for the generation of electricity. This proposed development assists in reducing the dependence on non-renewable sources, such as coal-fired power plants. The proposed development is also located in one (1) of the Strategic Transmission Corridors (namely the Central Corridor) as defined and in terms of the procedures laid out in GN 113 of 16 February 2028. For more information, please refer to the Alternatives section included in section 3.3 of this DBAR for an outline of the suitability of this activity.</p>
<p>1.8. How were a risk-averse and cautious approach applied in terms of ecological impacts?:</p> <p>1.8.1. What are the limits of current knowledge (note: the gaps, uncertainties and assumptions must be clearly stated)?</p> <p>1.8.2. What is the level of risk associated with the limits of current knowledge?</p>	<p>The precautionary approach has been adopted for this BA process (i.e. assuming the worst-case scenario will occur and then identifying ways to mitigate or manage these impacts).</p> <p>The assessment of cumulative impacts assumed that all proposed renewable energy developments (including associated power lines and substations) within a 35km radius will be</p>

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Question	Response
<p>1.8.3. Based on the limits of knowledge and the level of risk, how and to what extent was a risk-averse and cautious approach applied to the development?</p>	<p>constructed. In reality, only a handful of proposed renewable energy developments (including associated power lines and substations) would be constructed and therefore this approach is considered to be precautionary in nature. A cumulative impact assessment of similar developments in the area was undertaken by the respective specialists. Based on their findings, majority of the cumulative impacts associated with the proposed development can be kept low after the implementation of mitigation measures, with the exception of Socio-Economic, which will be negative high even after the implementation of mitigation measures. It should however be noted that the Socio-Economic specialist also found there to be Very High positive economic impacts. In addition, some of the specialists (namely Avifauna, Terrestrial Ecology and Heritage) found that the cumulative impacts associated with the proposed development can be kept to Medium after the implementation of mitigation measures. Despite the high cumulative impact from a Socio-Economic perspective, no fatal flaws have been identified and thus the proposed development should proceed from a cumulative impact assessment perspective. In addition, the proposed development is located within a Strategic Transmission Corridor (namely the Central Corridor) and thus fits within the development plans for the area.</p> <p>Additionally, based on the findings of the specialist assessments, the layout has been informed by the sensitive and “no-go” areas and these areas will be avoided accordingly, where possible.</p> <p>Please refer to Appendix 6 of this DBAR for the full specialist assessments (including walkdowns) which were undertaken as part of this BA process. These assessments outline the assumptions and limitations that were applicable to the respective assessments. All assumptions and limitations are described in section 2 of the DBAR for ease of reference.</p> <p>The risk associated with the limits in knowledge is considered to be low.</p>

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<p>1.9. How will the ecological impacts resulting from this development impact on people's environmental right in terms following:</p> <p>1.9.1. Negative impacts: e.g. access to resources, opportunity costs, loss of amenity (e.g. open space), air and water quality impacts, nuisance (noise, odour, etc.), health impacts, visual impacts, etc. What measures were taken to firstly avoid negative impacts, but if avoidance is not possible, to minimise, manage and remedy negative impacts?</p> <p>1.9.2. Positive impacts: e.g. improved access to resources, improved amenity, improved air or water quality, etc. What measures were taken to enhance positive impacts?</p>	<p>Please refer to section 6 and section 7 of this DBAR for the results of the specialist assessments which were undertaken as part of this BA process. In addition, all specialist assessments are provided in Appendix 6 of this DBAR.</p> <p>The overall negative impact to people's environmental right in terms of social and visual impacts are considered to be low to moderate respectively. It should be noted that the Socio-Economic Impact Assessment found there to be positive medium impacts for the operational phase, with positive very high economic cumulative impacts. In addition, the Desktop Social Impact Assessment (Appendix 6D) found that the positive elements outweigh the negative and that the project carries with it a significant social benefit. In addition, the project fits with international and governmental policy and legislation. Consequently, the proposed development is supported at the social level.</p>
<p>1.10. Describe the linkages and dependencies between human wellbeing, livelihoods and ecosystem services applicable to the area in question and how the development's ecological impacts will result in socio-economic impacts (e.g. on livelihoods, loss of heritage site, opportunity costs, etc.)?</p>	<p>This is considered and addressed as part of the Desktop Social Impact Assessment which was undertaken as part of the BA process for this proposed development (included in Appendix 6E and summarised in section 6.12 and section 7 of this DBAR).</p> <p>The study concluded that the positive elements outweigh the negative and that the project carries with it a significant social benefit. In addition, the project fits with international and governmental policy and legislation. Consequently, the proposed development is supported at the social level.</p>
<p>1.11. Based on all of the above, how will this development positively or negatively impact on ecological integrity objectives / targets / considerations of the area?</p>	<p>This has been discussed in detail in the Desktop Social Impact Assessment, which is summarised in section 6.12 and section 7 of this DBAR. The full impact assessment is included in Appendix 6E of this DBAR.</p> <p>The proposed development aligns with the vision and goals of the respective DMs as well as the LMs.</p> <p>The 2019/2024 Cape Winelands District Spatial Development Framework indicates that:</p>

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	<p><i>“The provincial energy focus is on lowering carbon emissions and local generation (e.g. renewable and greater use of gas)” (Cape Winelands District Municipality, 2020, p. 49).</i></p> <p><i>The IDP of the Namakwa District Municipality (2017-2022) states that “Renewable energy is recently one (1) of the cornerstones of the economy of the District and there needs to be engagement on National level to ensure that the District benefit from this resource.”</i></p> <p>Both the Witzenberg Municipal Spatial Development Framework and Amended Integrated Development Plan 2017 – 2022 indicate that:</p> <p><i>“The Witzenberg Municipality forms part of the Komsberg REDZ. Any projects or renewable energy developments in the municipal area should preferably be located inside of this boundary...” (Witzenberg Municipality Local Municipality, 2020, p. 65; Witzenberg Local Municipality, 2020, p. 53).</i></p> <p>The Karoo Hoogland’s IDP (2017-2022) identifies the renewable energy as a key economic sector and calls for economic interventions in sector development (namely agricultural, tourism and renewable energy).</p> <p>The total extent of the Koedoesberge-Moordenaars Karoo vegetation type found on-site is 47 145 009ha, very little of which has been transformed. It extends from near Tanqua Karoo towards Laingsburg and slightly beyond. It is important to emphasize that the spatial scale of transformation of natural habitats on-site due to the proposed project is negligible in area compared to the total area of vegetation types concerned, as well as any CBAs. The footprint of the proposed project will be relatively small due to the fact that each tower structure probably does not occupy more than a 10 x 10m area. Assuming a total distance of close to 50km for the power line, and a tower structure on average every 400m, this amounts to total area of less than 2ha. This is in comparison to the total area of Koedoesberge-Moordenaars Karoo, for</p>

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Question	Response
	example, which occupies in the vicinity of close to five hundred (500) square kilometres, or 50 million hectares. The loss of habitat associated with this project is therefore seven orders of magnitude smaller than this and therefore regionally insignificant. The proposed footprint of the infrastructure crosses CBA1 areas in the southern part of the site, as well as a very small segment in the northern end. It is not possible to avoid this CBA1 area. The study however concludes that sensitivities on-site can be minimised or avoided with the application of appropriate mitigation or management measures. In addition, currently, the rates of transformation within the vegetation in this area is low. None of the vegetation types affected by the proposed development are listed in the National List of Ecosystems that are Threatened and need of protection (GN1002 of 2011), published under the National Environmental Management: Biodiversity Act (Act No. 10, 2004).
1.12. Considering the need to secure ecological integrity and a healthy biophysical environment, describe how the alternatives identified (in terms of all the different elements of the development and all the different impacts being proposed), resulted in the selection of the "best practicable environmental option" in terms of ecological considerations?	Please refer to the Alternatives section (Section 3.3 of this DBAR) for an outline of the suitability of this activity. Sufficient number of alternatives were considered by all of the specialists. Recommendations were made which resulted in infrastructure being shifted to avoid sensitive features.
1.13. Describe the positive and negative cumulative ecological / biophysical impacts bearing in mind the size, scale, scope and nature of the project in relation to its location and existing and other planned developments in the area?	Kindly refer to the cumulative impact assessment section of the DBAR (Section 7.5).
2.1. What is the socio-economic context of the area, based on, amongst other considerations, the following considerations?	
2.1.1. The IDP (and its sector plans' vision, objectives, strategies, indicators and targets) and any other strategic plans, frameworks of policies applicable to the area,	In the Western Cape's Provincial Strategic Plan 2014 – 2019 (Western Cape Government, 2014, pp. 49-50) it is indicated that in its response to climate change " <i>...the province focuses on key areas of potential impact namely renewable energy,</i> " amongst other areas. With regards to the Northern Cape SDF, energy is one (1) of the primary objectives addressed. The energy objectives in the SDF include

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	<p>promoting the development of renewable energy supply schemes. Large-scale renewable energy supply schemes are also strategically important for increasing the diversity of domestic energy supplies and avoiding energy imports while minimising detrimental environmental impacts.</p> <p>Please refer to point 1.11 above as well as section 4.2.9 – 4.2.12 of the DBAR for motivation that support is evident across the respective district and local municipalities.</p> <p>Considering the policy and legislation referred to the project fits this framework. The project also falls within one (1) of the five (5) Strategic Transmission Corridors allocated by National Government. It also fits with the key point of the RMIPPPP and will assist in reducing load-shedding. Notwithstanding this, however, the provision that the project also conforms to appropriate scale and form, particularly considering the cumulative impacts associated with similar such projects in the area, will need to be considered on a broader basis than can be done as far as this report is concerned. In this regard attention will need to be given to the cumulative impacts at a later point in this report in as far as they relate to the social environment. In the following section a description of the affected environment is provided.</p>
2.1.2. Spatial priorities and desired spatial patterns (e.g. need for integration of segregated communities, need to upgrade informal settlements, need for densification, etc.),	Not applicable. The proposed development is located within a rural area and the affected sites are zoned for agricultural use. The area is sparsely populated with Witzenberg NU (Ward 12) having a population density of 4.91 people per km ² while the Karoo Hoogland NU (Ward 3) has a population density of 0.10 people per km ² .
2.1.3. Spatial characteristics (e.g. existing land uses, planned land uses, cultural landscapes, etc.)	<p>Please refer to section 6 and section 7 of this DBAR for a description of the receiving environment and results of the impact assessment, respectively.</p> <p>The impact of the proposed development on cultural / heritage areas (including archaeology and palaeontology) have been assessed in the form of a HIA. The HIA is provided in Appendix 6C of this DBAR, and the results are summarised in section 6.11 and section 7 respectively.</p>

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	<p>The area proposed for development is located within an undulating landscape within which the predominant land use is game grazing. It is a semi-arid region and the vegetation is characteristic of the Succulent Karoo Biome. The area is covered in varying densities of knee high scrub. There is a farm house and numerous jeep tracks across the large farm property but the site remains predominantly natural and very isolated. Natural ephemeral streams (currently dry) and man-made sources of water were observed. This natural pattern extends beyond the site in all directions, with the exception of the under construction Perdekraal East WEF (situated approximately 20km from the site) as well as the proposed Kudusberg WEF (authorised under 14/12/16/3/3/1/1976/AM1) and Oya Energy Facility (14/12/16/3/3/2/2009).</p> <p>An Agricultural and Soils Impact Assessment (Appendix 6A of this DBAR and results summarised in section 6.8 and section 7 respectively) was undertaken as part of the BA process and is included within this DBAR to reflect the impact of the proposed development in terms of the land use and agricultural potential. Proposed development will not have an unacceptable negative impact on the agricultural production capability of the site and is therefore acceptable. This is substantiated by the facts that the land is of very low agricultural potential, the amount of agricultural land loss is insignificant, and that the proposed development poses a low risk in terms of causing soil degradation.</p>
2.1.4. Municipal Economic Development Strategy ("LED Strategy").	<p>This has been discussed in detail in the Desktop Social Impact Assessment, which is summarised in section 6.12 and section 7 of this DBAR. The full impact assessment is included in Appendix 6D of this DBAR.</p> <p>Please refer to point 1.11 above as well as section 4.2.7 – 4.2.12 of the DBAR for motivation that support is evident across the respective district and local municipalities.</p>
2.2. Considering the socio-economic context, what will the socio-economic impacts be of the development (and its separate elements / aspects), and specifically also on the socio-economic objectives of the area?	<p>Please refer to the Desktop Social Impact Assessment summarised in section 6.12 and section 7 of this DBAR respectively, and included in Appendix 6D of this DBAR, for an outline of the</p>

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Question	Response
2.2.1. Will the development complement the local socio-economic initiatives (such as local economic development (LED) initiatives), or skills development programs?	social impacts that could occur due to the proposed development. In terms of physical, psychological, developmental, cultural and social needs and interests of the relevant communities, it must be noted that the closest community is over 20km from the proposed development.
2.3. How will this development address the specific physical, psychological, developmental, cultural and social needs and interests of the relevant communities?	The communities of Sutherland and Matjiesfontein would benefit from job creation which is much needed in these rural areas.
2.4. Will the development result in equitable (intra- and inter-generational) impact distribution, in the short- and long term? Will the impact be socially and economically sustainable in the short- and long-term?	Yes, economic benefits will flow to the local communities to ensure that the community is uplifted throughout the operational phase of the project.
2.5. In terms of location, describe how the placement of the proposed development will:	
2.5.1. result in the creation of residential and employment opportunities in close proximity to or integrated with each other,	Please refer to the Desktop Social Impact Assessment summarised in section 6.12 and section 7 of this DBAR respectively, and included in Appendix 6D of this DBAR, for an outline of the positive impacts associated with the creation of employment opportunities that could be created by the proposed energy facility. It must again be noted that the closest community is over 50km from the proposed development.
2.5.2. reduce the need for transport of people and goods,	Not applicable. This is a proposal for a grid connection infrastructure development proposed to feed the electricity generated by the proposed Oya Energy Facility (part of separate on-going EIA process with DEFF Ref No.: 14/12/16/3/3/2/2009) as well as potentially the nearby developments into the national grid.
2.5.3. result in access to public transport or enable non-motorised and pedestrian transport (e.g. will the development result in densification and the achievement of thresholds in terms public transport),	
2.5.4. compliment other uses in the area,	An Agricultural and Soils Impact Assessment was undertaken as part of the BA process in order to determine the impact on the current land-use. Refer to section 6.8, section 7 and Appendix 6A for a summary of the study and the full study, respectively.
2.5.5. be in line with the planning for the area,	The study area is unsuitable for cultivation and agricultural land use is limited to low density grazing. The area is thus not utilized for agriculture. The area is however utilized for low scale tourism and this is a suitable and complementary landuse to the proposed project.

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Question	Response
2.5.6. for urban related development, make use of underutilised land available with the urban edge,	Not applicable. The proposed development is located within a rural area and the proposed sites are zoned for agricultural use.
2.5.7. optimise the use of existing resources and infrastructure,	An overhead power line with a voltage capacity of 132kV will run from the proposed on-site substations to the national grid, at the Kappa Substation. In addition, the proposed development will make use of existing access roads as far as possible and will also make use of infrastructure sharing, where possible.
2.5.8. opportunity costs in terms of bulk infrastructure expansions in non-priority areas (e.g. not aligned with the bulk infrastructure planning for the settlement that reflects the spatial reconstruction priorities of the settlement),	Not applicable. This is a proposal for a grid connection infrastructure development proposed to feed the electricity generated by the proposed Oya Energy Facility (part of separate on-going EIA process with DEFF Ref No.: 14/12/16/3/3/2/2009) as well as potentially the nearby developments into the national grid. The proposed development is thus not related to bulk infrastructure expansion.
2.5.9. discourage "urban sprawl" and contribute to compaction / densification,	Please refer to the Desktop Social Impact Assessment summarised in section 6.12 and section 7 of this DBAR respectively, and included in Appendix 6D of this DBAR, for management measures on how to manage the impact associated with the ' <i>disruption of local social structures as a result of the construction workforce and in-migration of job seekers</i> '.
2.5.10. contribute to the correction of the historically distorted spatial patterns of settlements and to the optimum use of existing infrastructure in excess of current needs,	Not applicable. The proposed development is located within a rural area and the sites are zoned for agricultural use.
2.5.11. encourage environmentally sustainable land development practices and processes,	Based on the findings of the specialist assessments, the proposed development would <u>not</u> have a significant ('high') negative impact on the receiving environment, with the implementation of suitable mitigation measures (refer to section 7) and will therefore not go against sustainable land development practices and processes. In addition, the proposed development will be designed according to relevant national specifications and standards which are regarded as best practice in the renewable energy sector. In addition, the proposed development will be aligned with national planning priorities, as well as falling entirely within one (1) of the five (5) gazetted Strategic Transmission Corridors as defined and in terms of the procedures laid out in Government

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	Notice No. 113 of 16 February 2018, namely the Central Corridor.
2.5.12. take into account special locational factors that might favour the specific location (e.g. the location of a strategic mineral resource, access to the port, access to rail, etc.),	<p>Please refer to the Alternatives section included in section 3.3 of this DBAR for an outline of the selection and suitability of this activity.</p> <p>The location is furthermore favoured due to: entirely within Central Corridor of Strategic Transmission Corridors, proximity to Eskom grid infrastructure, ability to use existing access roads, landowner support and low environmental risk (as confirmed by the suite of specialists). In addition, the propose development aims at feeding the electricity generated by the proposed Oya Energy Facility as well as potentially the nearby developments into the national grid and can assist in reducing the risk of load-shedding.</p>
2.5.13. the investment in the settlement or area in question will generate the highest socio-economic returns (i.e. an area with high economic potential),	<p>Please refer to the Desktop Social Impact Assessment summarised in section 6.12 and section 7 of this DBAR respectively and included in Appendix 6D of this DBAR. It should be noted that the Applicant will ultimately own the proposed development and, if successful, will compile an Economic Development Plan which will inter alia set out to achieve the following:</p> <ul style="list-style-type: none"> ▪ benefit historically disadvantaged communities; ▪ Initiate a skills development and training strategy to facilitate future employment from the local community; ▪ Give preference to local suppliers for the construction of the facility; and ▪ Support local community upliftment projects and entrepreneurship through socio-economic and enterprise development initiatives.
2.5.14. impact on the sense of history, sense of place and heritage of the area and the socio-cultural and cultural-historic characteristics and sensitivities of the area, and	<p>A HIA, including Archaeology, Palaeontology and Cultural Landscapes, was undertaken as part of the BA process for this proposed development. The overall findings of the HIA indicated that ultimately, the proposed development is unlikely to have a negative impact on significant heritage resources on condition that the proposed mitigation measures including buffer areas and 'no-go' areas are implemented. It is also unlikely that the proposed development will negatively impact on significant archaeological heritage. In addition, as far as the palaeontology is concerned, the project may proceed. Impacts</p>

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	can therefore be mitigated to acceptable levels allowing for the development to be authorised.
2.5.15. in terms of the nature, scale and location of the development promote or act as a catalyst to create a more integrated settlement?	The proposed development falls entirely within one (1) of the five (5) gazetted Strategic Transmission Corridors, namely the Central Corridor. There are also thirteen (13) renewable energy developments (with associated substations and overhead power lines) which are proposed within a 35km radius of the proposed development, which lends itself potentially to a renewable energy development area. Refer to Table 33 for an outline of the other renewable energy developments which are being proposed or have already received approval within a 35km radius of the proposed development.
2.6. How were a risk-averse and cautious approach applied in terms of socio-economic impacts?	
2.6.1. What are the limits of current knowledge (note: the gaps, uncertainties and assumptions must be clearly stated)?	Please refer to the list of assumptions and limitations (Section 2) and the Desktop Social Impact Assessment summarised in section 6.12 and section 7 of this DBAR respectively and included in Appendix 6D of this DBAR. The overall conclusion is that the current knowledge base is sufficient to inform this BA.
2.6.2. What is the level of risk (note: related to inequality, social fabric, livelihoods, vulnerable communities, critical resources, economic vulnerability and sustainability) associated with the limits of current knowledge?	
2.6.3. Based on the limits of knowledge and the level of risk, how and to what extent was a risk-averse and cautious approach applied to the development?	
2.7. How will the socio-economic impacts resulting from this development impact on people's environmental right in terms following:	
2.7.1. Negative impacts: e.g. health (e.g. HIV-Aids), safety, social ills, etc. What measures were taken to firstly avoid negative impacts, but if avoidance is not possible, to minimise, manage and remedy negative impacts?	Please refer to the Desktop Social Impact Assessment summarised in section 6.12 and section 7 of this DBAR respectively and included in Appendix 6D of this DBAR.
2.7.2. Positive impacts. What measures were taken to enhance positive impacts?	Herewith a summary in response to these key questions: <ul style="list-style-type: none"> ▪ Concerning HIV prevalence, the Northern Cape had the lowest prevalence rate across South Africa at 8.3% in 2017, followed by the Western Cape with a prevalence rate of 8.9%. ▪ The area is most likely to have one (1) of the lowest HIV prevalence rates in the
2.8. Considering the linkages and dependencies between human wellbeing, livelihoods and ecosystem services, describe the linkages and dependencies applicable to the area in question and how the development's socioeconomic	

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Question	Response
impacts will result in ecological impacts (e.g. over utilisation of natural resources, etc.)?	<p>country, with the Namaqua District Municipality having a prevalence rate of 2.3% followed by the Central Karoo District with a prevalence rate of 6.9%.</p> <ul style="list-style-type: none"> ▪ The fact that sexually transmitted diseases tend to be spread by construction and transport workers, together with the high prevalence of HIV across the rest of South Africa, opens the area to a high risk of HIV infections. ▪ With the influx of labour, particularly following the construction of the various renewable energy projects within the region, the risk of HIV infections in the area is likely to rise significantly. This was assessed as a high risk with suitable mitigation measures proposed. ▪ The issues associated with the area being extremely poor and the associated disposable income that will follow the construction workers and truck drivers to the area will heighten the risk of the spread of HIV infections across what is a rather remote region ▪ An influx of temporary maintenance and service workers is likely to last over the operational phase of the project but is likely to settle within the medium term as the economy adjusts and the municipal authorities are able to respond to this growth. ▪ The cumulative economic impact of the project will be both positive and negative. The negative economic impacts, associated with a possible rise in living costs driven by market demand, are considered under the section above. Under this section the positive economic impacts will be addressed. ▪ From a positive perspective, the proliferation of renewable energy facilities within the region is likely to result in significant and positive cumulative impacts in the area in terms of both direct and indirect job creation, skills development, training opportunities, and the creation of business opportunities for local businesses.
2.9. What measures were taken to pursue the selection of the 'best practicable environmental option' in terms of socio-economic considerations?	
2.10. What measures were taken to pursue environmental justice so that adverse environmental impacts shall not be distributed in such a manner as to unfairly discriminate against any person, particularly vulnerable and disadvantaged persons (who are the beneficiaries and is the development located appropriately)? Considering the need for social equity and justice, do the alternatives identified, allow the "best practicable environmental option" to be selected, or is there a need for other alternatives to be considered?	
2.11. What measures were taken to pursue equitable access to environmental resources, benefits and services to meet basic human needs and ensure human wellbeing, and what special measures were taken to ensure access thereto by categories of persons disadvantaged by unfair discrimination?	
2.12. What measures were taken to ensure that the responsibility for the environmental health and safety consequences of the development has been addressed throughout the development's life cycle?	

NEED	
Question	Response
2.13. What measures were taken to:	
2.13.1. ensure the participation of all interested and affected parties,	<p>The activities which have been undertaken as part of the Public Participation Process for the proposed development, and which will still be undertaken as part of the BA process, are outlined in this DBAR (Appendix 7 and summarised in section 9 of this report). Various methods were employed to notify potential I&APs of the proposed development, namely through an advert in local and provincial newspapers, site notices on one (1) of the affected properties, notification letters, text messages (i.e. SMS notifications), email notifications and Background Information Documents (BIDs).</p> <p>The DBAR will be released for a 30-day review and commenting period to all the relevant I&APs, OoS / authorities and key stakeholders from 13 November 2020 to 14 December 2020 (excluding public holidays). In light of the country wide restriction enforced in terms of Government Gazette 43096 which has resulted in the entire country being placed in a national state of disaster and limits on the movement and gatherings of people in an effort to curb the spread CoVID-19, the public participation process has been amended and adjusted in light of these restrictions. In response, SiVEST has formulated a unique Public Participation process which is as closely related to the requirements of Regulations 39 to 44 of the EIA Regulations, 2014, as amended, (GNR 326) as possible. As a result, SiVEST have implemented a virtual and electronic public participation process, in which electronic Tablets will be located at public venues (namely the Sutherland Police Station and Witzenberg Local Municipality offices) in conjunction with a 'data free' website which will be set up in a way where the DBAR can be either viewed and/or downloaded free of charge. Furthermore, an electronic copy whereby all registered I&APs can download the DBAR is available on the following website: to http://ppp.g7energies.com/K6hqwnjlf87http://ppp.g7energies.com/KhyLA5479GYh (see section 9.8). This will ensure that all project related information associated with the BA process is readily available and accessible to any person with interest in the project, enabling the</p>
2.13.2. provide all people with an opportunity to develop the understanding, skills and capacity necessary for achieving equitable and effective participation,	
2.13.3. ensure participation by vulnerable and disadvantaged persons,	
2.13.4. promote community wellbeing and empowerment through environmental education, the raising of environmental awareness, the sharing of knowledge and experience and other appropriate means,	
2.13.5. ensure openness and transparency, and access to information in terms of the process,	
2.13.6. ensure that the interests, needs and values of all interested and affected parties were taken into account, and that adequate recognition were given to all forms of knowledge, including traditional and ordinary knowledge,	
2.13.7. ensure that the vital role of women and youth in environmental management and development were recognised and their full participation therein was promoted.	

NEED	
Question	Response
	<p>public participation process to be undertaken in line with Regulations 41 to 44 of the EIA Regulations, 2014, as amended. In addition, all key stakeholders / OoS / authorities will be sent electronic copies (via email) of the DBAR. Any I&APs which request electronic copies of the DBAR will also be sent these accordingly. All comments received will be responded to in a C&RR (to be included as Appendix 7E). Following the completion of the 30-day review and comment period, the DBAR will be updated, taking into account any comments received, and the FBAR will be submitted to the DEFF for decision-making. All &APs and key stakeholders / OoS / authorities, who are registered on the project database, will be notified of the submission of the FBAR accordingly.</p> <p>Please refer to section 9 for details regarding the PPP which has been undertaken as part of the BA process to date, as well as what is still planned.</p> <p>The BA process has taken cognisance of all interests, needs and values espoused by all I&APs, including occupiers. Opportunity for public participation will be provided to all I&APs throughout the BA process in terms of the 2014 EIA Regulations, as amended.</p>
2.14. Considering the interests, needs and values of all the interested and affected parties, describe how the development will allow for opportunities for all the segments of the community (e.g. a mixture of low-, middle-, and high-income housing opportunities) that is consistent with the priority needs of the local area (or that is proportional to the needs of an area)?	<p>Please refer to the Desktop Social Impact Assessment summarised in section 6.12 and section 7 of this DBAR respectively and included in Appendix 6D of this DBAR.</p> <p>In addition, please refer to points 2.13.1 – 2.13.7 above for details regarding the activities which have been undertaken as part of the Public Participation Process for the proposed development, and which will still be undertaken as part of the BA process. This is also outlined in Appendix 7 and section 9 of this report.</p>
2.15. What measures have been taken to ensure that current and/or future workers will be informed of work that potentially might be harmful to human health or the environment or of dangers associated with the work, and what measures have been taken to ensure that the right of workers to refuse such work will be respected and protected?	<p>An EMPr has been developed to address health and safety concerns and has been included in the BA report (Appendix 8). An Environmental Control Officer (ECO) will also be appointed to monitor compliance from an environmental perspective.</p>

NEED	
Question	Response
	All health and safety measures will strictly be followed in line with the OHS Act.
2.16. Describe how the development will impact on job creation in terms of, amongst other aspects:	
2.16.1. the number of temporary versus permanent jobs that will be created,	<p>Please refer to the Desktop Social Impact Assessment summarised in section 6.12 and section 7 of this DBAR respectively, and included in Appendix 6D of this DBAR.</p> <p>Jobs created during construction will outweigh jobs created during the operational phase. However, the steady rollout of procurement the construction staff component would be employable by the next power line and/or substation under construction in the area (considering the area being within a Strategic Transmission Corridor).</p> <p>As many local people as possible will be employed, however for certain highly skilled positions, employees may need to be sourced from outside the local communities. Currently, the land is not utilized for anything other than low level tourism which can continue in tandem to the proposed development. Therefore, there's no opportunity costs associated.</p>
2.16.2. whether the labour available in the area will be able to take up the job opportunities (i.e. do the required skills match the skills available in the area),	
2.16.3. the distance from where labourers will have to travel,	
2.16.4. the location of jobs opportunities versus the location of impacts (i.e. equitable distribution of costs and benefits),	
2.16.5. the opportunity costs in terms of job creation (e.g. a mine might create 100 jobs, but impact on 1000 agricultural jobs, etc.).	
2.17. What measures were taken to ensure:	
2.17.1. that there were intergovernmental coordination and harmonisation of policies, legislation and actions relating to the environment,	<p>Legislation, policies and guidelines, which could apply to impacts of the proposed development on the environment, have been considered. The scope and content of this DBAR have been informed by applicable integrated environmental management legislation and policies. This has been outlined in section 4 of this DBAR.</p> <p>The EAP timeously initiated engagement with the SAHRA and HWC to ensure the committee can provide input during the public consultation period.</p>
2.17.2. that actual or potential conflicts of interest between organs of state were resolved through conflict resolution procedures?	Refer to points 2.13.1 – 2.13.7 above
2.18. What measures were taken to ensure that the environment will be held in public trust for the people, that the beneficial use of environmental resources will serve the public interest, and that the environment will be protected as the people's common heritage?	The outcomes of this BA process and the associated conditions of the EA (should it be granted) will serve to address this question.

NEED	
Question	Response
2.19. Are the mitigation measures proposed realistic and what long-term environmental legacy and managed burden will be left?	<p>The mitigation measures proposed by the respective specialists have been included in the EMPr (Appendix 8), where applicable.</p> <p>The proposed mitigation measures have been informed by the respective specialist studies undertaken. This includes a detailed assessment of the environment as well as the impacts associated with the proposed development. Hybrid energy facilities and associated grid connections (substations and overhead power lines) can be dismantled and completely removed from the site leased for the proposed development and do not permanently prevent alternative land-uses on the same land parcel. Based on material and socio-economic terms and measured to the value of the best alternative that is not chosen, the proposed development will result in positive opportunity costs.</p>
2.20. What measures were taken to ensure that the costs of remedying pollution, environmental degradation and consequent adverse health effects and of preventing, controlling or minimising further pollution, environmental damage or adverse health effects will be paid for by those responsible for harming the environment?	The EMPr which is included in the BA report (Appendix 8) must form part of the contractual agreement and be adhered to by both the contractors / workers and the applicant.
2.21. Considering the need to secure ecological integrity and a healthy bio-physical environment, describe how the alternatives identified (in terms of all the different elements of the development and all the different impacts being proposed), resulted in the selection of the best practicable environmental option in terms of socio-economic considerations?	Please refer to the Alternatives section included in section 3.3 of this DBAR for an outline of the selection and suitability of this activity.
2.22. Describe the positive and negative cumulative socio-economic impacts bearing in mind the size, scale, scope and nature of the project in relation to its location and other planned developments in the area?	Please refer to section 7.5 of this DBAR for a summary of the cumulative impacts.

5.1 National Renewable Energy Requirement

As previously mentioned, the proposed development aims to feed the electricity generated by the proposed Oya Energy Facility as well as potentially the nearby developments into the national grid. In 2019, South Africa had 51 504MW of power generation capacity installed (IRP, 2019). Current forecasts

indicate that by 2030, the expected growth in demand will require the current installed power generation capacity to be increased to approximately 77 834MW (IRP,2019).

This growing demand, fuelled by increasing economic growth and social development within Southern Africa, is placing increasing pressure on South Africa's existing power generation capacity. Coupled with this, is the growing awareness of environmental impact, climate change and the need for sustainable development. Despite the worldwide concern regarding Green House Gas (GHG) emissions and climate change, South Africa continues to rely heavily on coal as its primary source of energy, while most of the country's renewable energy resources remain largely untapped. There is therefore an increasing need to establish a new source of generating power in South Africa within the next decade.

The use of renewable energy technologies, as one (1) of a mix of technologies needed to meet future energy consumption requirements is being investigated as part of Eskom's long-term strategic planning and research process. It must be remembered that solar energy is plentiful, renewable, widely distributed, clean and reduces GHG emissions when it displaces fossil-fuel derived from electricity. In this light, renewable solar energy can be seen as desirable.

The competitive nature of the REIPPPP's bidding process has resulted in significant lowering of solar and wind tariff prices since 2011. For example, the bidding tariffs of solar PV have decreased from R2.80/kWh in 2011 to sub-60c/kWh at present. Further projects will increase the competitive nature and further result in cost savings to South African consumers. In addition, as mentioned, the Minister of Mineral Resources and Energy has recently welcomed the concurrence by NERSA to the second Section 34 Ministerial Determination issued in February 2020. This is another milestone that gives effect to commitments made to increase generation capacity, and ensure security of energy supply to society rapidly and significantly. The Section 34 Determination enables the Department to undertake procurement of additional electricity capacity in line with the IRP (2019). This will open-up various BWs, including BW 5 of renewable energy. 6 800MW of capacity is determined to be generated from renewable energy sources (PV and Wind), 513MW from storage, 3 000MW from gas and 1 500MW from coal. This will enable the development of an additional 11 813MW of power in total from the year 2022. This is in addition to the 2 000MW already being procured under the RMIPPP (as per media statement released 10 September 2020²³).

5.2 National Renewable Energy Commitment

In support of the need to find solutions for the current electricity shortages, the increasing demand for energy, as well as the need to find more sustainable and environmentally-friendly energy resources, South Africa has embarked on an infrastructure growth programme supported by various government initiatives. These include the NDP, the Presidential Infrastructure Coordinating Commission (PICC), the DoE's Integrated Resource Plan, the National Strategy for Sustainable Development, the National Climate Change Response White Paper, the Presidency of the Republic of South Africa's Medium-Term Framework, and the National Treasury's Carbon TaxAct.

The Government's commitment to growing the renewable energy industry in South Africa is also supported by the *White Paper on Renewable Energy* (2003) which sets out the Government's principals, goals and objectives for promoting and implementing renewable energy in South Africa. In order to achieve the long-term goal of achieving a sustainable renewable energy industry, the DoE has set a target of contributing 40% of renewable energy to the final energy consumption by 2030. This target is to be produced mainly through, wind and solar; but also, through small-scale hydro and CSP. According to the IRP 2019, 1 474MW of solar PV energy output capacity had been installed by 2018 already

(Figure 6). Additionally, the IRP 2019 states that new installed energy capacity to 2030 will include approximately 6 484MW solar PV. It is also recommended that 10.5% of the generation capacity should be from solar PV energy by 2030 (IRP, 2019).

5.3 Reduced Dependency on Fossil Fuels

At present, more than 72% of South Africa's energy is generated by coal-fired power stations (based on installed capacity). Apart from the fact that these are finite resources that will eventually run out, fossil fuels are also harmful to the environment when used to produce electricity. During combustion, fossil fuels such as coal emit many by-products into the atmosphere, two (2) of which are CO₂ and sulphur dioxide (SO₂). Both of these gases have been shown to contribute to the worsening climate crisis. Solar is a free and infinite resource that occurs naturally in the environment. Converting solar energy into electricity releases no harmful by-products into the environment and will reduce South Africa's dependence on fossil fuels. As mentioned, the proposed development aims to feed the electricity generated a proposed hybrid energy facility (consisting of solar energy) as well as potentially the nearby developments into the national grid

As the 14th largest emitter of CO₂ in the world, we need to divert from coal and reduce our reliance on non-renewable resources in order to reduce the frequency and intensity of extreme weather events.

The South African government is currently procuring 2000MW of **ANY** technology that can deliver base load energy under the recently launched RMIPPPP. Due to strict testing requirements that a project developer must pass before commercial operations date, renewable energy can only deliver the required deliver base load energy **IF** coupled with fossil fuel. Should the project developer "bid" the proposed development and not be successful in the RMIPPPP or any other government run programme, it is highly likely that the South African government will procure generation from fossil fuel instead of a hybrid energy facility such as the proposed Oya Energy Facility. The objective of the proposed development is to feed electricity generated by the Oya Energy Facility as well as potentially the nearby developments into the national grid and can thus commit to feeding energy generated from clean, green energy (namely solar and wind) into the national grid. This allows the development to conform with the move towards a greener and cleaner energy generation mix in South Africa while also meeting the requirements of the RMIPPPP. The proposed development supports the objectives of the RMIPPPP, meets some of its key points and can ultimately assist in reducing the risk of load-shedding.

5.4 Stimulate the Economy

A significant portion of the capital expenditure envisaged for the proposed development will be spent on procurement of goods and services within South Africa and specifically within the Western Cape and Northern Cape Provinces. If goods and services are procured locally (i.e. within South Africa), it increases the production of the respective industries. This has a positive impact on the national economy and economies of the municipalities where inputs are procured.

The proposed development has the potential to stimulate the demand for other industries, among others construction services, engineering services, transport services, steel structures, cement and other aggregates, and electrical equipment. At the local level, increase in demand for accommodation, personal services, perishable and non-perishable goods is expected, which will stimulate the local

economies of the towns and settlements, where labour will be procured from or where migrant workers will be temporarily located.

The steady rollout of procurement from government can attract R40billion per annum i.e. R400billion during this decade. This is crucial considering that our economy is crippled as a result of CoVID-19 and looming load-shedding. There's very few infrastructure builds programmes that can attract that magnitude of much-needed investment.

Some of the local businesses could benefit from sub-contracting opportunities, if the construction companies appointed by the developer implement a local community procurement policy, and consumer expenditure of the construction crew. Furthermore, the demand for hospitality services is expected to increase and provide much-needed stimulus for the local economy.

It also must be noted that the requirements of the RMIPPPP have very stringent Economic Development Elements requirement which introduces specific aspects such as supplier development and elements to cater for youth, women and those living with disabilities. Specific focus in the RMIPPPP is placed on local content with local content now also being introduced and considered in the operational phase over the lifespan of a Project.

5.5 Job Opportunities and Household Livelihoods

Energy developments (such as this hybrid facility incorporating solar PV and a FBGF, with associated power lines and substations) create temporary and permanent job opportunities in South Africa for both skilled and un-skilled workers. The construction of the power line and substations will require the temporary employment of construction workers, supervisors, and engineers.

In addition to those benefitting from direct employment created at the proposed development, various multiplier effects will assist in temporarily supporting existing jobs in the businesses offering services and goods that will be procured during construction activities. The increased temporary income earned by these businesses will, in turn, stimulate consumer spending, creating another round of multiplier effect, positively impacting employment in the area.

Household earnings are linked closely with trends in employment and, as such, will be affected positively by the creation of jobs as discussed above. The creation of temporary jobs during the construction period will temporarily increase affected households' income. Some of this income will be earned by workers from the local communities. Given that most local households earn between R1-R3 200, a significant boost in household income may prevail. A temporary increase in living standards based on the additional monthly income is therefore expected. Employees working for local businesses that the Applicant aim to sub-contract to supply goods and services to the facility during construction, are also expected to benefit indirectly.

5.6 Skills Development

In addition to the job creation, there is valuable opportunities for skills enhancement and knowledge transfer as quite often input from experts are required in this field. Therefore, opportunities for guiding and training of local workers will be created. A variation of skill-sets is required ranging from semi-skilled construction workers to highly skilled engineers. The majority of the municipality's residents are low-

skilled, which means that with proper planning and recruitment strategies, many of the local unemployed residents could be hired as temporary construction workers provided they satisfy any other recruitment criteria.

Those employed will either develop new skills or enhance current skills. This implies that inexperienced workers will have the opportunity to attain and develop new skills, while experienced workers will further improve their existing skills. Albeit the employment is temporary, the skills attained will be of long-term benefit to employees. However, these skills will need to be supported and practised on a regular basis to remain current.

6 DESCRIPTION OF THE RECEIVING ENVIRONMENT

A general description of the study area is outlined in the section below. The receiving environment in relation to each specialist study is also provided.

6.1 Regional Locality

The proposed development is located approximately 50km north-west of the town of Matjiesfontein in the Witzenberg and Karoo Hoogland Local Municipalities, in the Cape Winelands and Namakwa District Municipalities of the Western and Northern Cape provinces respectively (**Figure 7**). The existing gravel road, linked to the R356, is the preferred access road to the proposed project site as it is an existing road and allows direct access to the affected sites.

The centre point coordinates for the substation sites as well as the centre line coordinates for the power line corridors (including preferred Oya to Kappa power line corridor route alternative) are included in **Table 10** below.

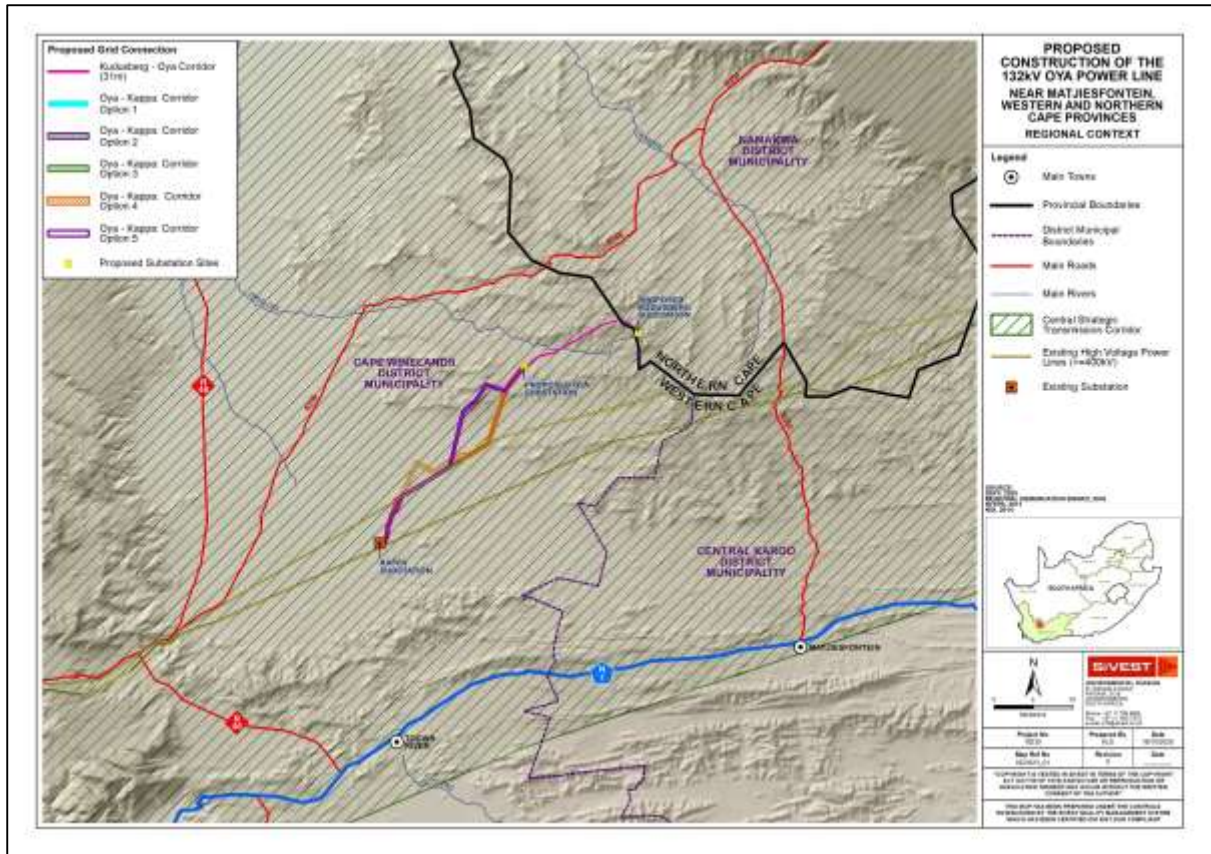


Figure 7: Regional context of the Oya Power Line and on-site substations

6.2 Study Site Description

The proposed Kudusberg substation²⁰ will be located on Remainder of the Farm Matjes Fontein No 194, while the proposed Oya substation¹⁹ will be located on Remainder of the Farm Baakens Rivier No 155. As mentioned, only one (1) route is possible for the Kudusberg to Oya power line corridor route. Power Line Corridor Alternative 4 has been selected as the preferred power line corridor for the Oya to Kappa power line corridor route. The following farms / properties will be traversed by the proposed power line corridors:

- Remainder of the Farm Baakens Rivier No 155
- Portion 1 of the Farm Gats Rivier No 156
- Remainder of the Farm Gats Rivier No 156
- Portion 1 of the Farm Amandelboom No 158
- Remainder of the Farm Oliviers Berg No 159
- Portion 4 of the Farm Bantamsfontein No 168
- Portion 13 of the Farm Bantamsfontein No 168
- Remainder of the Farm Lower Roodewal No 169
- Remainder of the Farm Matjes Fontein No 194
- The Farm Platfontein No 240
- The Farm Die Brak No 241
- Remainder of the Farm Rietpoort No 243

The area proposed for development is located within an undulating landscape within which the predominant land use is game grazing. It is a semi-arid region and the vegetation is characteristic of

the Succulent Karoo Biome. The area is covered in varying densities of knee-high scrub. There is a farm house and numerous jeep tracks across the large farm property but the site remains predominantly natural and very isolated. Natural ephemeral streams (currently dry) and man-made sources of water were observed. This natural pattern extends beyond the site in all directions, with the exception of the under construction Perdekraal East WEF (situated approximately 20km from the site) as well as the proposed Kudusberg WEF (authorised under [14/12/16/3/3/1/1976/AM1](#)) and Oya Energy Facility ([14/12/16/3/3/2/2009](#)).

A locality map indicating the farms / properties affected by the substation sites as well as those traversed / affected by the power line corridor route alignment (including preferred power line corridor route alternative) is provided in **Figure 8** below.

A layout map indicating the preferred layout in relation to the sensitive / “no-go” areas identified by the specialists is indicated in **Figure 80** in **section 8**

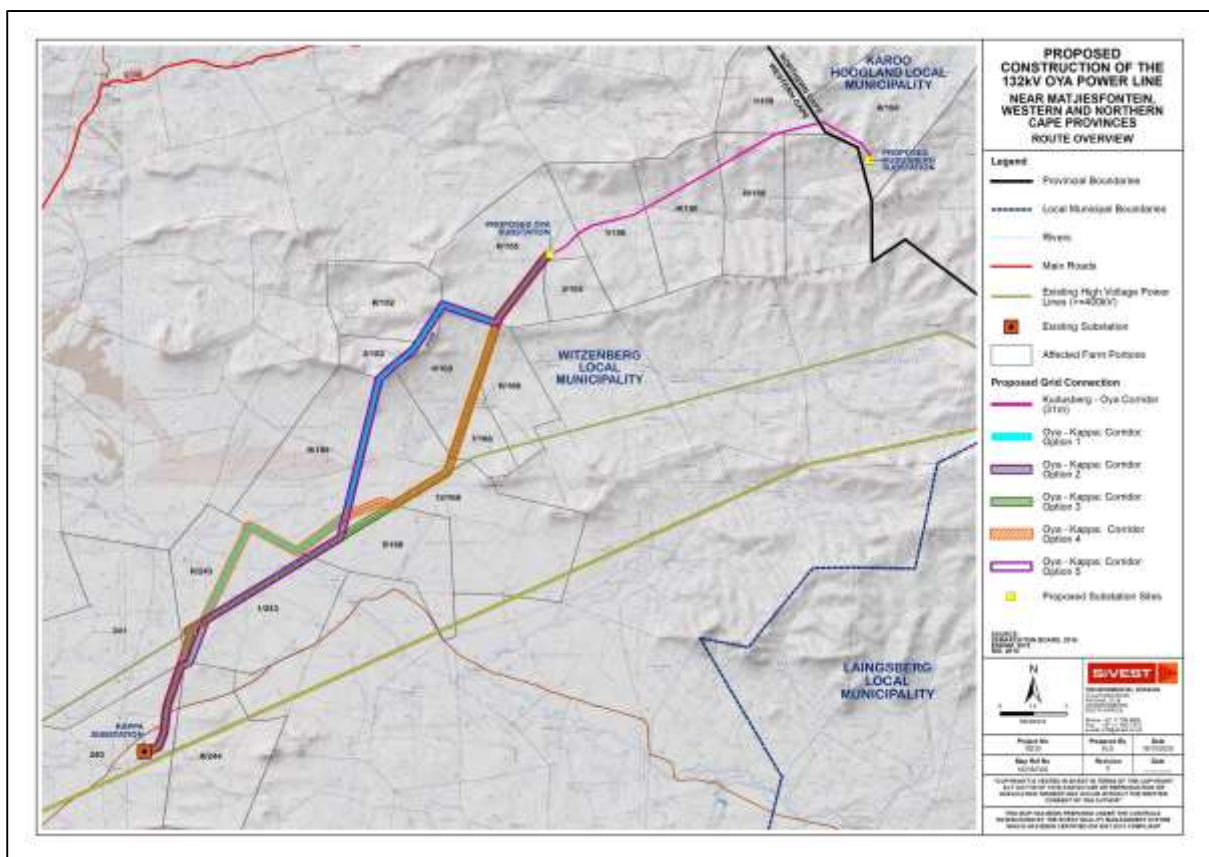


Figure 8: Site locality

The centre point coordinates for the substation sites as well as the centre line coordinates for the proposed power line corridors are included in **Table 10** and **Table 11** below.

Table 10: Substation Site Locations

OYA GRID: SUBSTATION SITE COORDINATES			
SUBSTATION	AREA (HECTARES)	CENTRE POINT COORDINATES	
		SOUTH	EAST
33/132kV Oya Substation ¹⁹	4	S32° 54' 24.448"	E20° 12' 28.565"
33/132kV Kudusberg Substation ²⁰	4	S32° 52' 9.50"	E20° 21' 47.01"

Table 11: Proposed Power Line Corridor Route Centre Line Coordinates

OYA GRID: KUDUSBERG TO OYA POWER LINE CORRIDOR ROUTE				
CENTRE LINE COORDINATES (DD MM SS.sss)				
CORRIDOR	START POINT (KUDUSBERG SUB)	MIDDLE POINT	END POINT (OYA SUB)	APPROX LENGTH (KM)
Kudusberg to Oya	S32° 52' 6.431"	S32° 52' 22.996"	S32° 54' 24.448"	16.6
	E20° 21' 51.032"	E20° 17' 13.070"	E20° 12' 28.565"	
OYA GRID: PREFERRED POWER LINE CORRIDOR ROUTE ALTERNATIVE (OYA TO KAPPA)				
CENTRE LINE COORDINATES (DD MM SS.sss)				
CORRIDOR ALTERNATIVE	START POINT (OYA SUB)	MIDDLE POINT	END POINT (KAPPA SUB)	APPROX LENGTH (KM)
Alternative 4 (Oya to Kappa)	S32° 54' 24.448"	S33° 0' 51.986"	S33° 6' 29.185"	32.94
	E20° 12' 28.565"	E20° 6' 19.061"	E20° 0' 40.626"	

6.3 Topography

The proposed power line and substations are located in the scenic Karoo region of the Western and Northern Cape Provinces which is generally associated with wide vistas and mountainous landscapes. The topography in the broader study area is largely dominated by the mountains / hills at the southern end of the Klein Roggeveld range. Much of the north-eastern sector of the study area is therefore dominated by the steep slopes and broad ridges of these mountains and escarpments. The south-eastern sector of the study area is however characterised by flat to gently undulating plains interspersed with areas of localised hills and koppies.

The topography of the proposed site and surrounding area is shown in **Figure 9** below. The slope classification of the site and surrounding area is shown in **Figure 10** below. This shows that the landscape on site varies from level to steep.

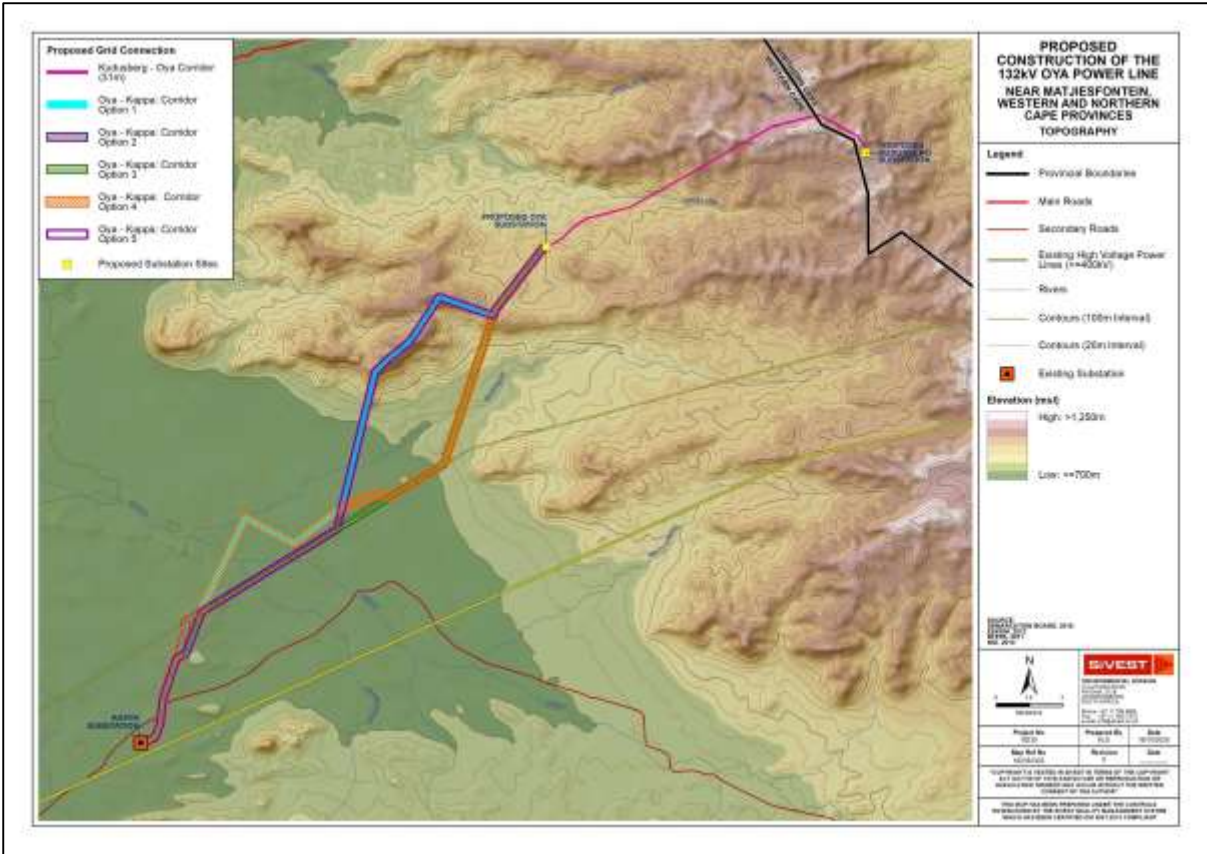


Figure 9: Topography of the study area

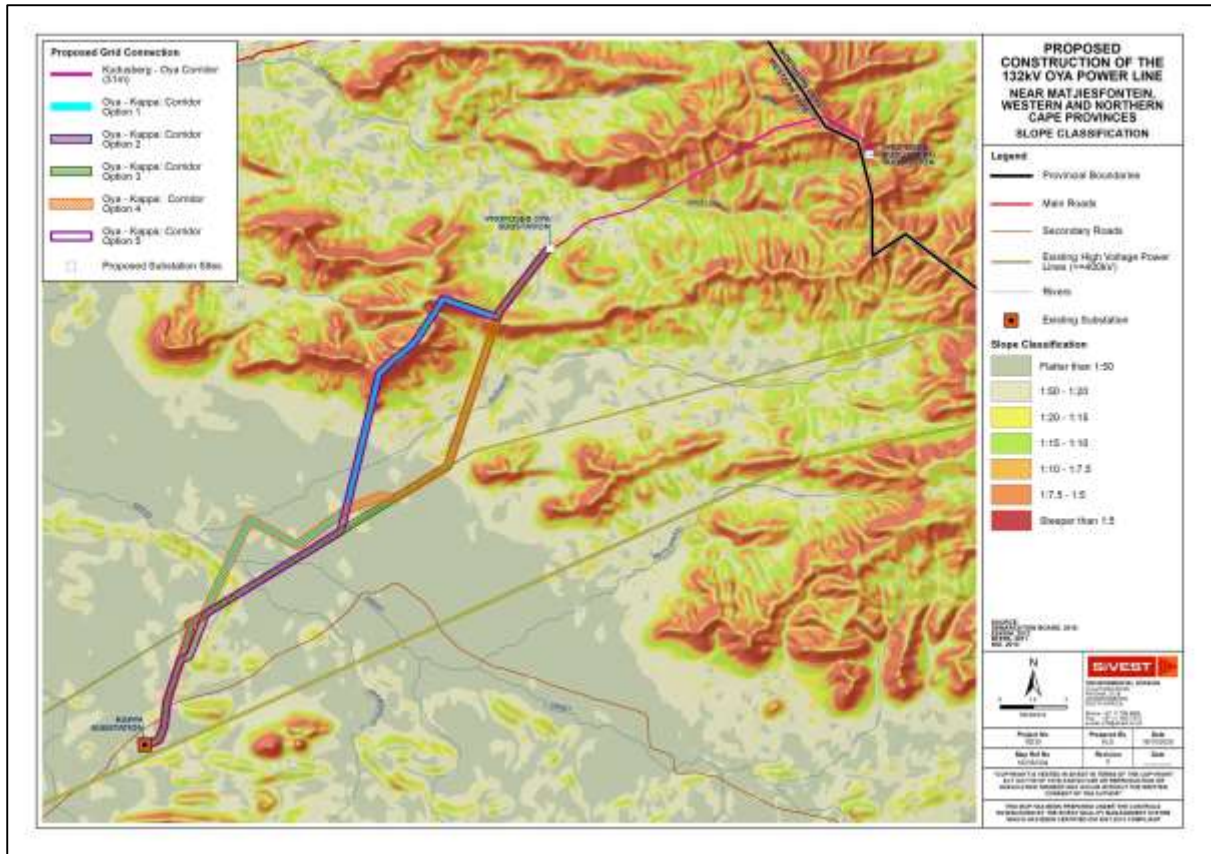


Figure 10: Slope classification of the study area

6.4 Geology

According to the extract from the Council for GeoScience Map 3220 for Sutherland (Figure 11) and Map 3320 for Ladismith (Figure 12), the area proposed for development is underlain by sediments of the Karoo Supergroup assigned to the Dwyka, Ecca and Witteberg Groups in addition to Quaternary Sands.

Geological Maps are presented in Figure 11 and Figure 12 below.

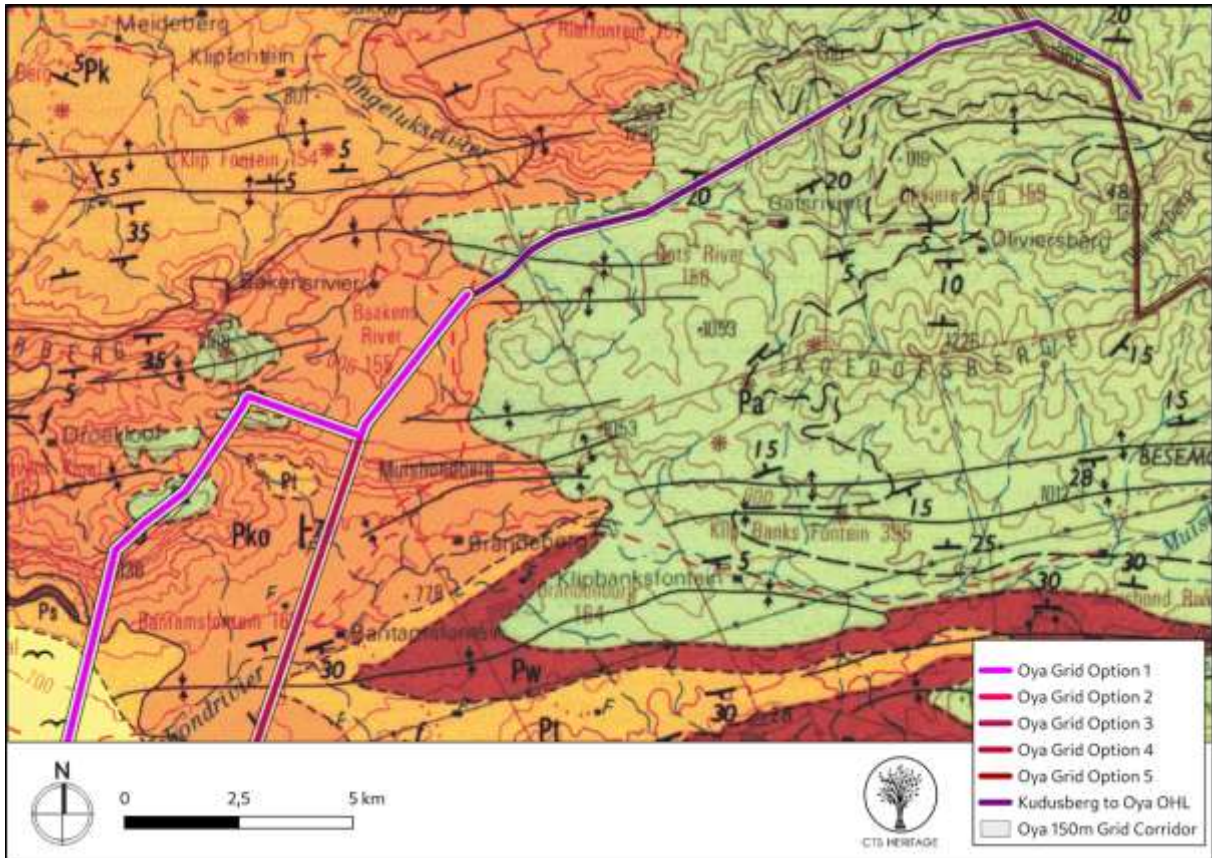


Figure 11: Geology Map. Extract from the CGS 3220 Sutherland Map indicating that the northern portion of the development area is underlain by sediments of the Karoo Supergroup assigned to the Tierberg (Pt) and Koedoesberg (Pko) formations of the Ecca Group, as well as the Abrahamskraal Formation (Pa) of the Beaufort Group and Quaternary Sands

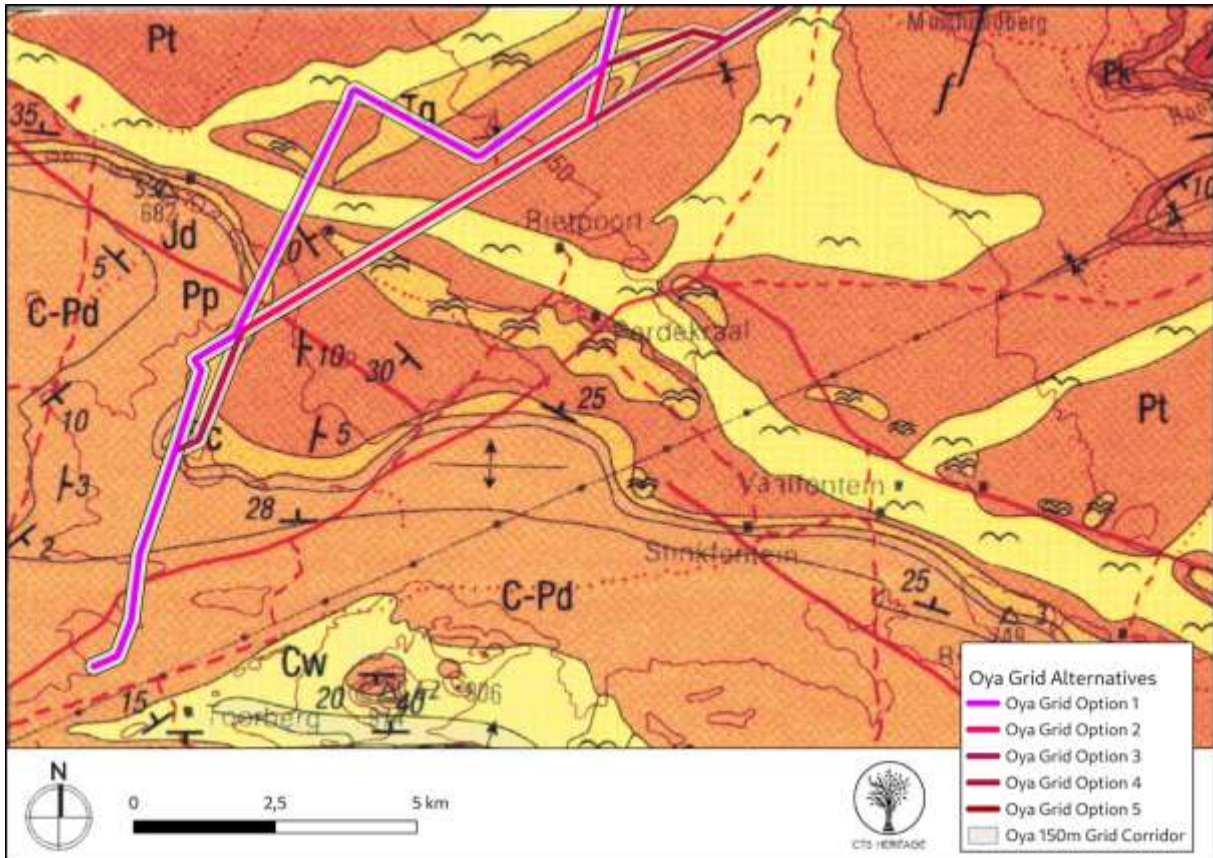


Figure 12: Geology Map. Extract from the CGS 3320 Ladismith Map indicating that the development area is underlain by sediments of the Karoo Supergroup assigned to the Dwyka group (C-Pd), as well as the Prince Albert (Pp), Tierberg (Pt) and Collingwood (Pc formations of the Ecca Group, as well as the Waaipoort (Cw) formation of the Witteberg Group and Quaternary Sands (Tg)

Table 12: Explanation of symbols for the geological map

Symbol	Group	Formation	Lithology	Approximate Age	Palaeontology
Pa	Beaufort, Adelaide Subgroup	Abrahamskraal	Green to blue-grey mudstones	266 – 250 Ma	Bioturbation, Trance fossils ~Tapinocephalus Assemblage Zone
Pko	Ecca	Waterford Fm. (Old Koedoesberg Fm.)	Shales, siltstones, sandstones.	290 – 266 Ma	Wave ripples, silicified wood, Trace fossils.
Ps		Skoorsteensberg	Sandstone interbedded with shale		Trace fossils, Glossopteris
Pt		Tierberg	Dark shales, yellow tuffs.		Invertebrate fossils, sponge spicules, trace fossils, fish scales
Pp		Prince Albert	Shales, wackes, arenite.		Marine invertebrates, fish (Dwykaselachus oosthuizeni), coprolites.
C-Pd	Dwyka		Diamictites	290 – 317 Ma	Wood, trace fossils, invertebrates, pollen.

6.5 Land Use

According to the South African National Land Cover dataset (GeoTerra Image 2018), much of the visual assessment area is characterised by natural vegetation which is dominated by Karoo and Fynbos shrubland interspersed with natural grassland.

Agricultural activity in the area is restricted by the arid nature of the local climate and areas of cultivation are largely confined to relatively limited areas distributed along drainage lines. As such, the natural vegetation has been retained across much of the study area. Livestock farming (mostly sheep) is the dominant activity, although the climatic and soil conditions have resulted in low densities of livestock and relatively large farm properties across the area. Thus, the area has a very low density of rural settlement, with relatively few scattered farmsteads in evidence. Built form in much of the study area is limited to isolated farmsteads, including farm worker's dwellings and ancillary farm buildings, gravel access roads, telephone lines, fences and windmills.

High voltage power lines in the study area however form significant man-made features in an otherwise undeveloped landscape. These power lines include 765kV power lines and 400kV power lines which bisect the south-western sector of the study area in a south-west to north-east alignment. In addition, the Kappa 765/400kV substation, situated at the southern end of the power line assessment corridors, is a substantial anthropogenic feature with a distinctly more industrial character, resulting in a significant degree of transformation in the landscape.

In addition, the Perdekraal East wind farm is located in the south-western sector of the study area. Construction of this facility has only recently been completed and the landscape has undergone significant transformation as a result of the construction activities.

Further human influence is visible in the area in the form of the DR1475 District Road which traverses the south-western sector of the study area in a west to north-east direction. This is however a gravel road and thus conforms to the typical natural rural character of the study area.

The closest built-up area is the small town of Touws River which is situated approximately 26km south of Kappa Substation while Matjiesfontein is some 55kms to the south-east. These small towns are well outside the visual assessment zone and thus not expected to have an impact on the visual character of the study area.

A map showing the land use in the region of the study area is provided in **Figure 13** below.

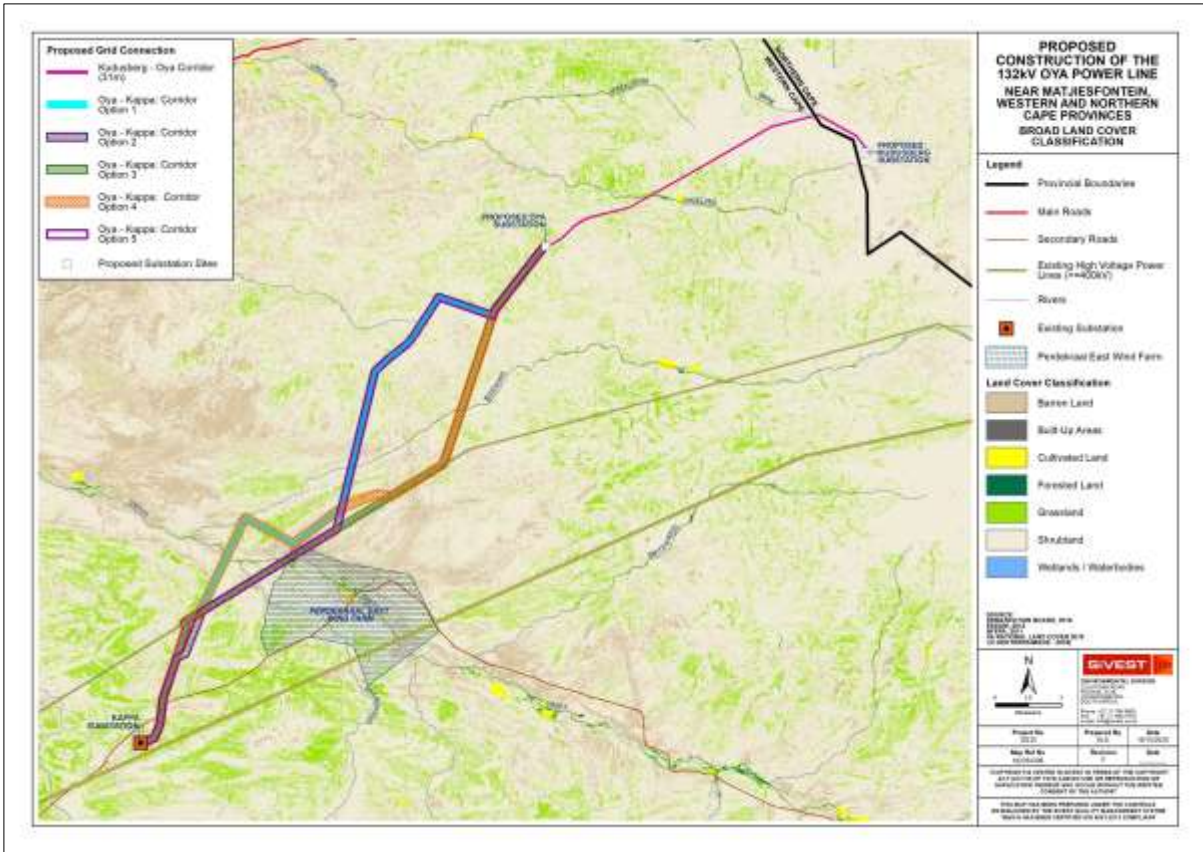


Figure 13: Land use in the region of the study area

6.6 Climate

The climate in the greater Matjiesfontein area is semi-arid with a mean annual rainfall of about 353mm (www.worldweatheronline.com). Figure 14 below shows the mean monthly rainfall and temperatures in the Matjiesfontein area, which is approximately 44km from the proposed development.

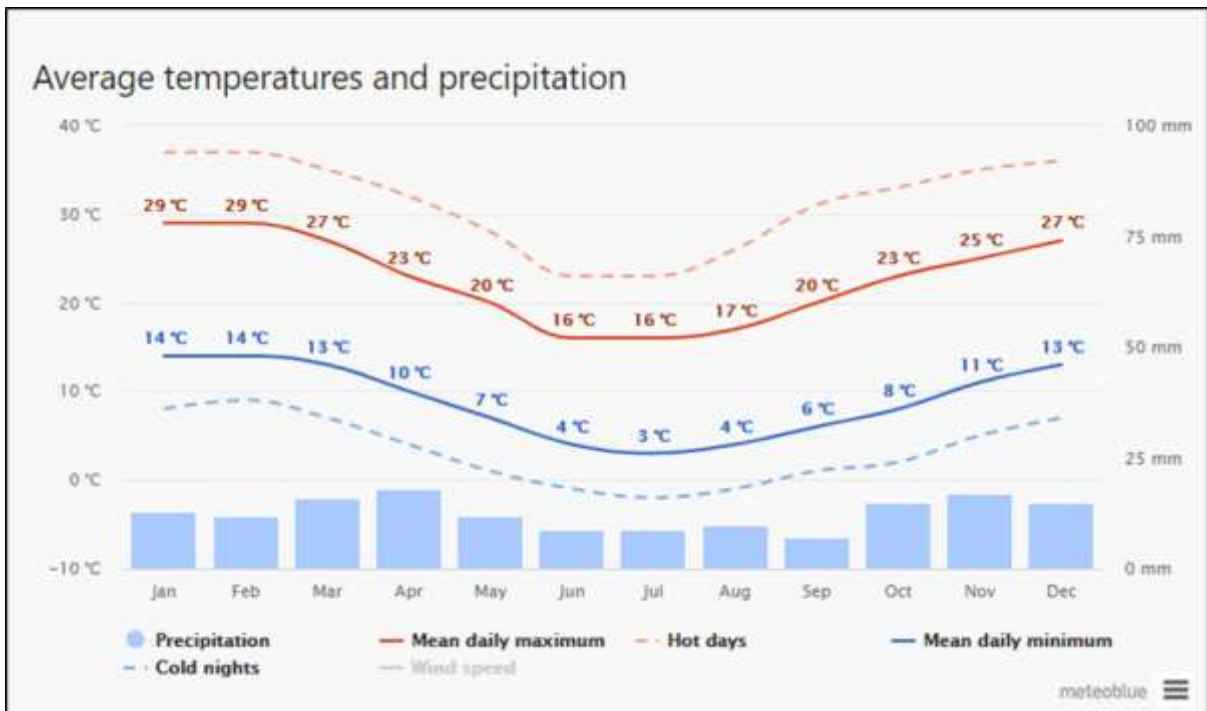


Figure 14: The "mean daily maximum" (solid red line) shows the maximum temperature of an average day for every month for Matjiesfontein. Likewise, "mean daily minimum" (solid blue line) shows the average minimum temperature. Hot days and cold nights (dashed red and blue lines) show the average of the hottest day and coldest night of each month of the last 30 years

6.7 Terrestrial Ecology

The Terrestrial Ecology Impact Assessment was conducted by Dr David Hoare (David Hoare Consulting) and is included as **Appendix 6F**. The assessment has been based on a desktop assessment of the study area, mapping from aerial imagery, two (2) reconnaissance site visits, and a detailed walk-through survey of the entire footprint of the proposed project. Three (3) site visits were ultimately undertaken, one (1) on 9 July 2020, one (1) on 10 September 2020, and the third on 12 - 24 October 2020. The three (3) site visits covered seasonal variation as well as growth at the height of the growing season. Specific features of potential concern were investigated in the field.

The environmental baseline from a terrestrial ecological perspective is presented below.

6.7.1 Description of the terrestrial ecology environment

6.7.1.1 Broad Vegetation Patterns

There are four (4) regional vegetation types occurring in the general area, namely Central Mountain Shale Renosterveld, Koedoesberge-Moordenaars Karoo, Tankwa Wash Riviere and Tankwa Karoo.

The national vegetation map (Mucina & Rutherford 2006) for the study area is depicted below in **Figure 15** below.

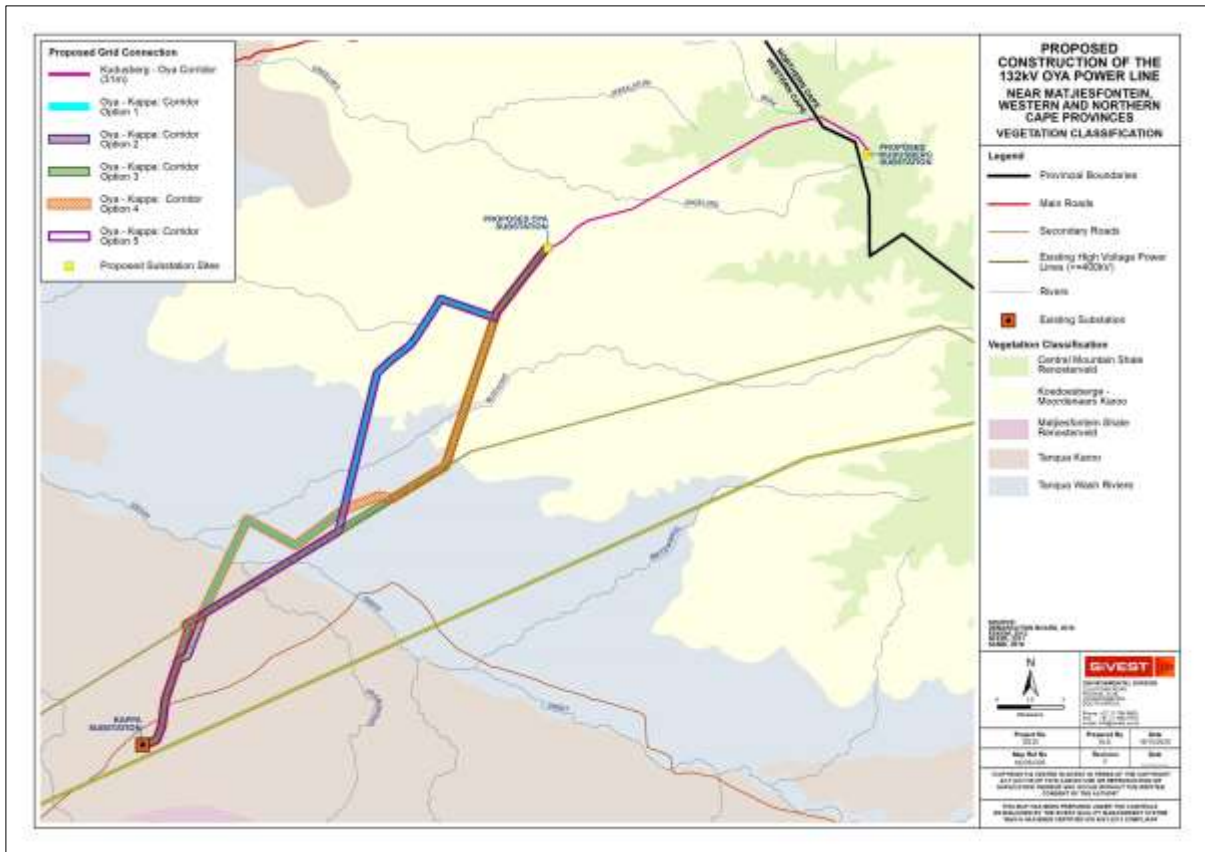


Figure 15: Vegetation types of the study area

The vegetation types that occur on-site and nearby areas are briefly described below.

Central Mountain Shale Renosterveld

Slopes and broad ridges of low mountains and escarpments, with tall shrubland dominated by renosterbos and large suites of mainly non-succulent karoo shrubs and with a rich geophytic flora in the undergrowth or in more open, wetter or rocky habitats.

Koedoesberge-Moordenaars Karoo

The vegetation occurs on slightly undulating to hilly landscape covered by low succulent scrub and dotted by scattered tall shrubs, patches of ‘white’ grass visible on plains, the most conspicuous dominants being dwarf shrubs of *Pteronia*, *Drosanthemum* and *Galenia*.

Tanqua Wash Riviere

Deeply incised valleys (sometimes several hundred metres broad) of intermittent rivers supporting a mosaic of succulent shrublands with *Salsola* and *Lycium* alternating with *Acacia karoo* gallery thickets. The broad sheet-wash plains support sparse vegetation of various *Salsola* species, often building phytogenic hillocks interrupting the monotonous barren face of a sheet wash. Occasional rainfalls in early winter result in localised displays of annuals and early flowering geophytes along washes.

Tanqua Karoo

Slightly undulating intra-mountain basin sheltered by steep slopes of mountain ranges. The plain is interrupted by a series of solitary dolerite butts and elevated ridges, extensive, flat sheet-washes and deeper incised channels of intermittent rivers (these habitats support vegetation of the AZi 7 Tanqua Wash Riviere). The plains are very sparsely vegetated (low succulent shrubland with *Ruschia*, *Drosanthemum*, *Aridaria*, *Augea*, *Zygophyllum*), in extreme precipitation-poor years appearing barren,

while the slopes of the koppies and adjacent mountain piedmonts support well-developed medium-tall succulent *Euphorbia hamata*–*Pteronia incana* shrubland (Rubin 1998). Small quartz patches occur in the southern Tanqua Basin. Annual flora (*Gazania lichtensteinii*, *Euryops annuus*, *Ursinia nana*) becomes conspicuous with sufficient precipitation, while geophytes and grasses play a subordinate role. *Stipagrostis ciliata* and *S. obtusa* can become locally dominant in places.

6.7.1.2 Conservation Status of Broad Vegetation Types

On the basis of a scientific approach used at national level by SANBI (Driver *et al.*, 2005), vegetation types can be categorised according to their conservation status which is, in turn, assessed according to the degree of transformation relative to the expected extent of each vegetation type. The status of a habitat or vegetation type is based on how much of its original area still remains intact relative to various thresholds. The original extent of a vegetation type is as presented in the most recent national vegetation map (Mucina, Rutherford & Powrie 2005) and is the extent of the vegetation type in the absence of any historical human impact. On a national scale the thresholds are as depicted in **Table 18** below, as determined by best available scientific approaches (Driver *et al.*, 2005). The level at which an ecosystem becomes Critically Endangered differs from one ecosystem to another and varies from 16% to 36% (Driver *et al.*, 2005).

Determining ecosystem status (Driver <i>et al.</i> , 2005). *BT = biodiversity target (the minimum conservation requirement).			
Habitat remaining (%)	80–100	least threatened	LT
	60–80	vulnerable	VU
	*BT–60	endangered	EN
	0–*BT	critically endangered	CR

Table 13: Conservation status of different vegetation types occurring in the study area

Vegetation Type	Target (%)	Conserved (%)	Transformed (%)	Conservation status	
				Driver <i>et al.</i> 2005; Mucina <i>et al.</i> , 2006	National Ecosystem List (NEM:BA)
Koedoesberge-Moordenaars Karoo	19	0.3	1	Least threatened	Not listed
Central Mountain Shale Renosterveld	27	0	1	Least threatened	Not listed
Tanqua Wash Riviere	19	13	3	Least threatened	Not listed
Tanqua Karoo	19	14	1	Least threatened	Not listed

According to scientific literature (Driver *et al.*, 2005; Mucina *et al.*, 2006), as shown in **Table 13**, all four (4) vegetation types are listed as Least Threatened. The total extent of the Koedoesberge-Moordenaars Karoo vegetation type is 47,145,009ha, very little of which has been transformed. It extends from near Tanqua Karoo towards Laingsburg and slightly beyond.

The National List of Ecosystems that are Threatened and need of protection (GN1002 of 2011), published under the National Environmental Management: Biodiversity Act (Act No. 10, 2004), lists national vegetation types that are afforded protection on the basis of rates of transformation. The thresholds for listing in this legislation are higher than in the scientific literature, which means there are fewer ecosystems listed in the National Ecosystem List versus in the scientific literature.

None of the vegetation types are listed in the National List of Ecosystems that are Threatened and need of protection (GN1002 of 2011).

6.7.1.3 Biodiversity Conservation Plans

The Western Cape CBA map classifies the natural vegetation of the province according to conservation value in decreasing value, as follows:

1. Protected Area
2. Critical Biodiversity Area 1
3. Critical Biodiversity Area 2
4. Ecological Support Area 1: Terrestrial
5. Ecological Support Area 1: Aquatic
6. Ecological Support Area 2
7. Other Natural Area: Natural to Near Natural
8. Other Natural Area: Degraded
9. No Natural Remaining

This shows features within the study area within three (3) of these classes, as shown in **Figure 16** below:

1. **Critical Biodiversity Areas 1:** There is a broad area of CBA1 that runs through the south-central part of the study area, associated with the broad Tanqua drainage system running through the study area. There are other areas of CBA1 in the northern part of the study area (**Figure 16**), but these have mostly been excluded from the footprint of the proposed project. **For the proposed power line, the entire development area (except for the drainage basin) is located outside of CBA1 and CBA 2**
2. **Ecological Support Areas 1 (ESA 1):** All of the drainage lines and riparian habitat in the study area has been designated as Ecological Support Area 1
3. **Other Natural Areas (ONA):** The majority of the site in is an ONA

A map showing the CBAs and ESAs which can be found within the broader study area is provided in **Figure 16** below.

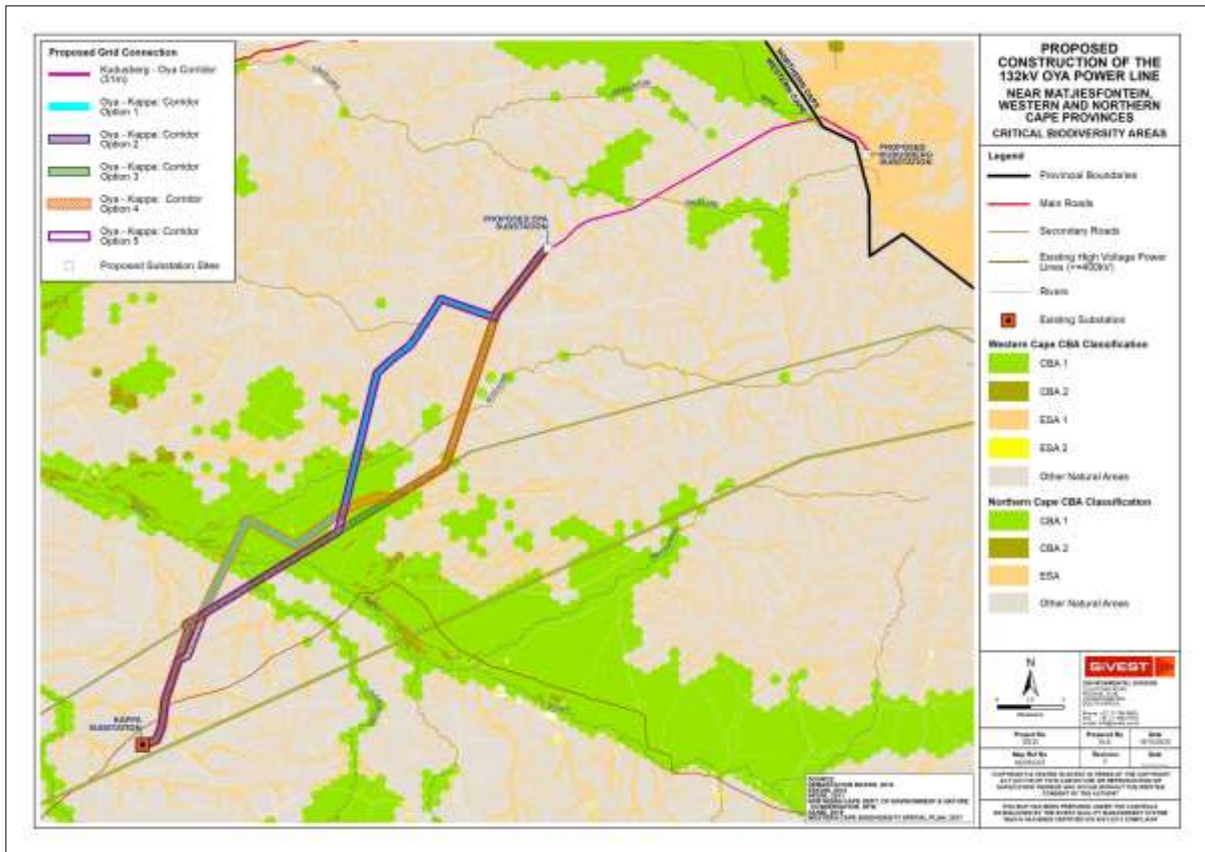


Figure 16: Western Cape CBA map for the study area.

The Western Cape Biodiversity Spatial Plan Handbook (Pool-Stanvliet *et al.*, 2017) provides recommended guidelines for land-use activities within different CBA categories and these provide the best indication of the type of development that may or may not be acceptable within these defined units. Those that are relevant to the current project are as follows:

Map Category	Desired Management Objective
Critical Biodiversity Area 1	Keep natural, with no further loss of habitat. Degraded areas should be rehabilitated. Only low-impact, biodiversity-sensitive land-uses are appropriate.
Ecological Support Area 1: Terrestrial	Maintain in a functional, near-natural state. Some habitat loss is acceptable, provided the underlying biodiversity objectives and ecological functioning are not compromised.
Other Natural Area	Minimise habitat and species loss and ensure ecosystem functionality through strategic landscape planning. Offers flexibility in permissible land-uses, but some authorisation may still be required for high impact land uses.

According to the Western Cape Biodiversity Spatial Plan Handbook (Pool-Stanvliet *et al.*, 2017), the desired land management objective in CBA1 areas is to maintain the area in a natural state with no biodiversity loss. The Plan does not support developments that result in the significant transformation of natural habitat within CBA1 areas.

6.7.1.4 Proposed Protected Areas

According to the National Parks Area Expansion Strategy (NPAES), there are no areas within the study area that have been identified as priority areas for inclusion in future protected areas. The study area is therefore outside the NPAES focus area. The entire study area is also outside of the Draft 2018

NPAES. There are many areas outside of the study site, to the north, south, east and west that are included as being part of future protected areas, but not within or adjacent to the site itself.

6.7.1.5 Red List Plan Species of the Study Area

Lists of plant species previously recorded in the study area were obtained from the South African National Biodiversity Institute (SANBI) website (<http://newposa.sanbi.org/>). These are listed in Appendix 3 of the Terrestrial Ecology Impact Assessment Report (**Appendix 6F**). This list has been supplemented from information obtained from two (2) published sources (Van der Merwe *et al.*, 2008 a, b; Clark *et al.*, 2011; Steyn *et al.*, 2013) as well as a published specialist report for the neighbouring WEF project (Ekotrust 2018). This list was refined for the study area after the suitability of the site had been assessed for the species on this list during a detailed field survey of the site.

Table 14: Explanation of IUCN Version 3.1 categories (IUCN 2001) and Orange List categories (Victor & Keith 2004)

IUCN / Orange List category	Definition	Class
EX	Extinct	Extinct
CR	Critically Endangered	Red List
EN	Endangered	Red List
VU	Vulnerable	Red List
NT	Near Threatened	Orange List
Declining	Declining taxa	Orange List
Rare	Rare	Orange List
Critically Rare	Rare: only one subpopulation	Orange List
Rare-Sparse	Rare: widely distributed but rare	Orange List
DDD	Data Deficient: well known but not enough information for assessment	Orange List
DDT	Data Deficient: taxonomic problems	Data Deficient
DDX	Data Deficient: unknown species	Data Deficient

The list contains 28 species listed in an IUCN threat category (Critically Endangered, Endangered or Vulnerable (see **Table 14** above) of which two (2) have a possibility of occurring in the general area and in the type of habitats available in the study area. This does not mean that they will occur there, only that a literature review has identified that these are species that should be assessed as possibly occurring in the area. These species are as follows: *Lotononis venosa*, and *Octopoma nanum*. Neither of these species were encountered on site or on the WEF project (Ekotrust 2018).

There are an additional three (3) species that are listed as Near Threatened that were assessed as having a possibility of occurring on site, two (2) of which have been previously recorded in the study area (Ekotrust 2018), namely *Geissorhiza karooica* (Iridaceae) and *Lachenalia whitehillensis* (Hyacinthaceae). Both of these are spring-flowering geophytes, and neither was seen on the current site. The other species is *Ehrharta eburnea*. None of these three species were found on site.

There are an additional 24 species listed by SANBI as either Rare or Critically Rare, five (5) of which have been previously recorded in the study area (Ekotrust 2018), namely *Bulbine torta* (Asphodelaceae), *Cleretum lyratifolium* (Aizoaceae), *Eriocephalus grandiflorus* (Asteraceae), *Moraea contorta* (Iridaceae), and *Pectinaria articulata* (Apocynaceae). These are all late-winter to early spring-flowering plants, four of which were not seen on the current site. The succulent, *Pectinaria articulata*, was recorded a number of times on site but not within the servitude of the powerline.

For all the species discussed here, it must be kept in mind that species are listed in a threat category or in a rarity category often due to being extremely rare as well as being threatened by some factor. They could also be highly cryptic or seasonal and therefore difficult to spot. It is usually very difficult to locate such species, even when it is known that they occur in a particular locality. One way of addressing this uncertainty is to attempt to identify habitats in which they are most likely to occur and then to treat these habitats as being potentially sensitive on the basis of being possible habitat for species of concern. This is somewhat circular, but of value in the absence of confirmed siting's. Logically, it is also only possible to prove the presence of a species, not its absence.

6.7.1.6 Protected Plants (National Environmental Management: Biodiversity Act)

Plant species protected under the National Environmental Management: Biodiversity Act, 2004 (Act 10 of 2004) are listed in Appendix 6 of the Terrestrial Ecology Impact Assessment Report (**Appendix 6F**). One (1) species on this list could potentially occur on-site, namely *Hoodia gordonii*. There are no other plant species protected according to this legislation that have a geographical distribution that includes the study area.

Hoodia gordonii

This species is widespread in the arid parts of South Africa and also occurs in Namibia, Botswana and Angola. It occurs in a wide variety of arid habitats from coastal to mountainous, on gentle to steep ridges and from dry, rocky places to sandy spots in riverbeds. It is harvested indiscriminately for its high economic value nationally and internationally. It can be locally common, but its status is unknown due to high levels of recent decline. It is currently listed as Data Deficient on the Red List of South African Plants (<http://redlist.sanbi.org/species.php?species=2705-13>, accessed on 21 July 2020). Any impacts on this species will require a permit from the relevant authorities. A walk-down survey did not encounter any individuals of this species.

6.7.1.7 Protected Plants (Cape Nature and Environmental Conservation Ordinance 19 of 1974)

Plant species protected under the Cape Nature and Environmental Conservation Ordinance 19 of 1974 are listed in Appendix 5 of the Surface Water Impact Assessment Report (**Appendix 6F**). There are two (2) Schedules under this Ordinance, the first (Schedule 3) being Endangered species and the second (Schedule 4) Protected species. None of the species in the first Schedule (Schedule 3: Endangered species) have a geographical distribution that includes the site. They therefore do not occur there.

A number of species protected according to Schedule 4 were found on-site. From the field surveys of the site, this includes the following species:

- *Antimima hallii* (AIZOACEAE)
- *Antimima pumila* (AIZOACEAE)
- *Astroloba bullulata* (ASPHODELACEAE)
- *Babiana cuneata* (IRIDACEAE)
- *Babiana spathacea* (IRIDACEAE)
- *Brunsvigia comptonii* (AMARYLLIDACEAE)
- *Cephalophyllum* sp. (AIZOACEAE)
- *Cheiridopsis namaquensis* (AIZOACEAE)
- *Crassula columnaris* subsp. *columnaris* (CRASSULACEAE)
- *Delosperma* sp. (AIZOACEAE)
- *Drosanthemum* sp. (AIZOACEAE)

- *Gladiolus splendens* (IRIDACEAE)
- *Hammeria gracilis* (AIZOACEAE)
- *Hammeria meleagris* (AIZOACEAE)
- *Lampranthus* sp. (AIZOACEAE)
- *Leipoldtia schultzei* (AIZOACEAE)
- *Mesembryanthemum guerichianum* (AIZOACEAE)
- *Mesembryanthemum junceum* (AIZOACEAE)
- *Mesembryanthemum nitidum* (AIZOACEAE)
- *Mesembryanthemum noctiflorum* (AIZOACEAE)
- *Mesembryanthemum tortuosum* (AIZOACEAE)
- *Microlooma sagittatum* (APOCYNACEAE)
- *Moraea cuspidata* (IRIDACEAE)
- *Moraea flaccida* (IRIDACEAE)
- *Moraea pritzeliana* (IRIDACEAE)
- *Moraea tripetala* (IRIDACEAE)
- *Pectinaria articulata* (APOCYNACEAE)
- *Psilocaulon junceum* (AIZOACEAE)
- *Quaqua mammillaris* (APOCYNACEAE)
- *Ruschia intricata* (AIZOACEAE)
- *Ruschia multiflora* (AIZOACEAE)
- *Veltheimia capensis* (HYACINTHACEAE)

Despite not being threatened, any impacts on these species (and other additional species that may be found that are listed as protected) will require a permit from the relevant authorities. An application for a permit for these species is being applied for. Many of these species are widespread and not of any conservation concern but protected due to the fact that the Cape Nature and Environmental Conservation Ordinance 19 of 1974 protects entire families of flowering plants irrespective of whether some members are rare or common. The identity, location and numbers of protected plants has been established during a walk-down survey of the proposed infrastructure footprint, and the measures to manage these are described in a Plant Rescue/Management Plan. A permit application is currently in progress.

6.7.1.8 Protected Trees

Tree species protected under the National Forest Act are listed in Appendix 2 of the Terrestrial Ecology Impact Assessment Report (**Appendix 6F**). There are none with a geographical distribution that includes the region in which the proposed project is located. There is one (1) species that has a geographical distribution that ends south of the study area, namely *Podocarpus latifolius*, but this species does not occur near to the site.

In summary, no species of protected trees were found or are likely to occur in the geographical area that includes the site.

6.7.1.9 Vertebrate Animal Species of the study Area

Vertebrate species (mammals, reptiles, amphibians) with a geographical distribution that includes the study area are listed in Appendix 4 of the Surface Water Impact Assessment Report (**Appendix 6F**). All threatened (Critically Endangered, Endangered or Vulnerable) or near threatened vertebrate animals that could occur in the study area and have habitat preference that includes habitats available in the study area, are discussed further below.

Mammals

There are 56 mammal species that have a geographical distribution that includes the study area, of which seven (7) are listed in a conservation category of some level (see Appendix 3 of Surface Water Impact Assessment Report - **Appendix 6F**). This is a relatively moderate to low diversity of mammals compared to other parts of South Africa. Based on the natural state of the study area and surrounding areas, it is considered likely that many of these species could occur on site, especially the smaller species, such as various rodents, insectivores and small predators. Listed species with a geographical range that includes the site are discussed in more detail below to evaluate the potential for them to occur on site.

- Riverine Rabbit

The Riverine Rabbit (*Bunolagus monticularis*), listed as Critically Endangered, has not been previously recorded in the grid in which the site is located. Known records include grids further to the north, east and south of the current site, most of which are on the highlands above the escarpment slopes. Although not previously recorded in the grid in which the site is located nor any immediately adjacent grids, the relatively wide distribution and scattered records, including a number of recent new sightings in widely-separated locations, suggest that there is a possibility of individuals occurring on site or migrating through the site, if suitable habitat occurs there. Habitat suitability monitoring (Collins & Du Toit 2016) indicates that the site is marginal for the species. The species has narrowly defined habitat requirements and is found only in dense riverine vegetation on alluvial soils adjacent to seasonal rivers. Within the study area are a number of non-perennial watercourses, but none of these are significant in terms of having both extensive and deep alluvial soils as well as dense riverine vegetation. It is considered that there is a very low possibility of the species being found on site. Nevertheless, any suitable habitat should be treated as sensitive and appropriately managed during this project.

- Black Rhinoceros

The Black Rhinoceros (*Diceros bicornis bicornis*), listed as Critically Endangered, has a geographical distribution that includes the study area. The species is confined to formal conservation areas as well as a few individuals held on private land. Although the habitat on-site is suitable for this species, it does not occur there and would not be found there unless deliberately introduced.

- Grey Rhebok

The Grey Rhebok (*Pelea capreolus*), listed as Near Threatened, is endemic to South Africa, Lesotho and parts of Swaziland. In the south and southwest, their distribution is associated with the rocky hills of mountain Fynbos and the Little Karoo (Taylor *et al.*, 2016). They are predominantly browsers, feeding on ground-hugging forbs, and largely water independent, obtaining most of their water requirements from their food (Taylor *et al.*, 2016). Local declines in their population have been attributed to increased densities of natural predators, such as Black-backed Jackal, Caracals and Leopards. It has been recorded in both grids in which the site is located, and a small number were seen on a nearby site. However, it is a relatively mobile species and not necessarily dependent on habitat at any particular location. It is more likely to be found lower down in the topography, on the lowland plains and footslopes rather than high up on the ridge. It is likely to move away from the path of any construction and development of parts of the study area. The proposed development is therefore unlikely to have any negative effect on the species, even though it probably occurs there.

- Black Footed Cat

The Black-footed Cat (*Felis nigripes*), listed as Vulnerable, has been previously recorded in the grid to the north of the study area, but not in the grid in which the project is located. It's known distribution is on the inland part of most of South Africa, but seemingly not within the winter-rainfall part of the country. It also occurs in Botswana and Namibia. The current site is therefore on the western limit of its general distribution, although there is undoubtedly a possibility of it occurring in the area. The species is nocturnal and carnivorous, favouring any vegetation cover that is low and not too dense. They make use of dens in the daytime, which can be abandoned termite mounds, or dens dug by other animals,

such as aardvark, springhares or cape ground squirrels. Local declines in their population have been attributed to increased densities of natural predators, such as Black-backed Jackal, Caracals and Leopards. They are highly vulnerable to domestic carnivores. The study area is definitely suited to this species and it could occur there, although not likely in high densities. The proposed development is therefore unlikely to have significant negative effect on the species, even though it is likely to occur there.

- Leopard

The Leopard (*Panthera pardus*), listed as Vulnerable, has a wide habitat tolerance, but with a preference for densely wooded areas and rocky areas. In montane and rocky areas of the Western and Northern Cape, they prey on dassies and klipspringers. They have large home ranges, but do not migrate easily, males having ranges of about 100 km² and females 20km². It has been recorded in two (2) adjacent grids, as well as throughout most of the Fynbos Biome. It has been confirmed by landowners to occur in the area, so there is a high probability of this species occurring on site, in which case it would be at very low densities. The proposed project could displace individuals but is unlikely to have a significant effect on overall population densities.

- Spectacled Dormouse

The Spectacled Dormouse (*Graphiurus ocularis*), listed as Near Threatened, is endemic to South Africa, where it is found in the Northern, Eastern and Western Cape Provinces. It is associated with rock piles, crevices, outcrops and stone kraals. They may be territorial. The site is well-within the known distribution of this species and there are historical records for two adjacent grids to the east, although not from the current grid. There is therefore a high probability of the site being suitable for this species. It is considered likely that it could occur on site and individuals could be affected by construction activities, if suitable habitat is damaged.

- African Striped Weasel

The African Striped Weasel (*Poecilogale albinucha*), listed as Near Threatened, is found throughout most of South Africa, except for the arid interior, and into central Africa (excluding Namibia). It has not been recorded in the grid in which the site is located or any surrounding grid, but the site is within the overall distribution range for the species. It is found primarily in moist grasslands and fynbos, where adequate numbers of prey may be found. It is considered unlikely to occur in the study area and the proposed development will therefore not affect this species.

Of the species currently listed as threatened or protected [see Appendix 5 of Surface Water Impact Assessment Report (**Appendix 6F**) for list of protected species], those listed in **Table 15** are considered to have a low - medium probability of occurring on site and being potentially negatively affected by proposed activities on site.

Table 15: Mammal species of conservation concern with a likelihood of occurring on site

Scientific name	Common name	Status	Likelihood of occurrence
<i>Panthera pardus</i>	Leopard	Vulnerable, protected	High
<i>Graphiurus ocularis</i>	Spectacled Dormouse	Near Threatened	High
<i>Pelea capreolus</i>	Grey Rhebok	Near Threatened	High
<i>Mellivora capensis</i>	Honey Badger	Protected	Medium
<i>Felis nigripes</i>	Black-footed Cat	Vulnerable	Medium
<i>Bunolagus monticularis</i>	Riverine Rabbit	Critically Endangered, protected	Low
<i>Poecilogale albinuca</i>	African Striped Weasel	Near Threatened	Low

Reptiles

A total of 74 reptile species have a geographical distribution that includes the general study area in which the site is found (Alexander & Marais 2007, Bates *et al.*, 2014, Branch 1988, Marais 2004, Tolley & Burger 2007). This is a fairly high potential diversity compared to average diversity in other parts of the country. Of the reptile species that could potentially occur in the study area, the Karoo Dwarf Tortoise, listed as Near Threatened, has been listed in a threat category.

- Karoo Dwarf Tortoise

The Karoo Dwarf Tortoise (*Chersobius boulengeri*), listed as Near Threatened, is associated with dolerite ridges and rocky outcrops of the southern Succulent Karoo and Nama-Karoo Biomes, and Albany Thicket in the southeast, at altitudes of approximately 800m to 1 500m. It occurs within dwarf shrubland that often contains succulent and grassy elements (Bates *et al.*, 2014). It usually takes shelter under rocks in vegetated areas or in rock crevices. It has been previously recorded in the grid in which the site is located and, based on habitat requirements, there is a high probability that the species could occur on-site.

- Armadillo Girdled Lizard

The Armadillo Girdled Lizard (*Ouroborus cataphractus*), protected according to the National Environmental Management: Biodiversity Act, 2004 (Act 10 of 2004), is endemic to the Succulent Karoo Biome in the winter rainfall zone of the Northern and Western Cape, South Africa (Mouton 2014). It occurs from the southern Richtersveld to the southern Tankwa Karoo and Matjiesfontein. It is group-living and found in rock crevices, especially of sandstone. It is particularly abundant on rock outcrops on the western coastal lowlands, but also found on lower mountain slopes (Mouton 2014). It has been previously recorded in the grid in which the site is located as well as all the surrounding grids and, based on habitat requirements, there is a high probability that the species occurs on-site.

There is therefore one (1) reptile species of conservation concern and one (1) protected reptile species that could potentially occur in the study area and that may therefore be affected by the proposed project, shown in **Table 16**.

Table 16: Reptile species of conservation concern with a likelihood of occurring on site

Scientific name	Common name	Status	Likelihood of occurrence
<i>Chersobius boulengeri</i>	Karoo Dwarf Tortoise	Near Threatened	High
<i>Ouroborus cataphractus</i>	Armadillo Girdled Lizard	Protected	High

Amphibians

A total of only seven (7) frog species have a geographical distribution that includes the general study area in which the site is found (Du Preez & Carruthers 2009). Some of these species are only marginally present in the study area due to the fact that their distribution range ends close to the study area. Of the frog species that could potentially occur in the study area, none are listed in a threat category.

It is concluded that the site contains habitat that is suitable for various frog species, although no species of conservation concern are likely to occur in the study area.

Table 17: Amphibian species of conservation concern with a likelihood of occurring on site.

Scientific name	Common name	Status	Likelihood of occurrence
None	None	N/A	N/A

6.7.1.10 Protected Animals

There are a number of animal species protected according to the National Environmental Management: Biodiversity Act (Act No. 10 of 2004). According to this Act, “a person may not carry out a restricted activity involving a specimen of a listed threatened or protected species without a permit issued in terms of Chapter 7”. Such activities include any that are “of a nature that may negatively impact on the survival of a listed threatened or protected species”. This implies that any negative impacts on habitats in which populations of protected species occur or are dependent upon would be restricted according to this Act.

Those species protected according to the National Environmental Management: Biodiversity Act (Act No. 10 of 2004) that have a geographical distribution that includes the site are listed in Appendix 6 of the Surface Water Impact Assessment Report (**Appendix 6F**), marked with the letter “N”. This includes the following species: Black Rhinoceros (does not occur on-site), Honey Badger, Black-footed Cat, Leopard, Cape Fox, Riverine Rabbit (unlikely to occur on-site) and Armadillo Lizard.

Due to habitat and forage requirements, and the fact that some species are restricted to game farms and/or conservation areas, only the Honey Badger, Black-footed Cat, Leopard, Cape Fox, Riverine Rabbit and Armadillo Lizard have any likelihood of occurring on site. Some of these species are mobile animals (Honey Badger, Black-footed Cat, Leopard, Cape Fox) that are likely to move away in the event of any activities on site disturbing them. However, there are some (Armadillo Lizard) that may be dependent on a small patch of habitat within their range to exist there. They could therefore be affected by the proposed development of the project, although the risk is low.

6.7.1.11 Habitats Found On-site

The natural habitat units found on-site broadly correspond with the national vegetation types, with added variation due to local drainage and surface rockiness. These are as follows:

1. Mountain summit vegetation (Central Mountain Shale Renosterveld);
2. Hills vegetation (Koedoesberge-Moordenaars Karoo);
3. Lowland plains vegetation (Tanqua Karoo);
4. Broad lowland floodplain vegetation (Tanqua Wash Riviere).
5. Rocky outcrops & cliffs;
6. Quartz patches;
7. Stream beds and associated riparian vegetation.

These are described in more detail below.

Hills and Plains Vegetation

The general study area is characterised by a low succulent, dwarf shrubland, typical of the regional vegetation type, Koedoesberge-Moordenaars Karoo, which is described as “low succulent scrub and scattered tall shrubs, patches of ‘white’ grass visible on plains, the most conspicuous dominants being dwarf shrubs of *Pteronia*, *Drosanthemum* and *Galenia*” (Mucina & Rutherford 2006).

This is also equivalent to *Ruschia intricata* – *Mesembryanthemum noctiflorum* Tanqua Karoo described by Van der Merwe et al. (2008a; 2008b). It is also within the area described as Association 4: *Leipoldtia schultzei* – *Euphorbia mauritanica* lower slopes by EKOTRUST CC (2018) in the assessment report for the proposed development of the 325 MW Kudusberg Wind Energy Facility, the study area of which partially overlaps with the current site.

The general floristic character of this vegetation on site is fairly uniform across wide areas, often dominated by the same suite of species, including *Ruschia spinosa*, *Pteronia incana*, *Galenia africana*, *Lycium cinereum*, *Asparagus capensis*, *Leipoldtia schultzei* and *Erioccephalus punctulatus*. However, any local variation in topography can lead to localized increase in richness associated with a more

diverse species composition. There is a high degree of succulence in the flora of this vegetation, a function largely of the aridity of the area, the mostly winter rainfall and the skeletal soils. The vegetation is drought-hardy and tolerant of a low level of grazing / browsing, but it has a low ability to recover from disturbance where the vegetation cover is removed. This is a typical pattern in arid areas where slow growth rates and water-scarcity do not allow rapid recovery from vegetation loss. In this vegetation, there are low rates of recruitment and existing plants are relatively old. The vegetation is an important cover for the landscape and, although not necessarily floristically sensitive, is sensitive to disturbance.

Riparian, Drainage and Floodplain Vegetation

There is a network of dry stream beds throughout the study area, with smaller streams eventually joining together to form larger systems further downstream. In the upper reaches of slopes these start as dry drainage lines that reflect the characteristics of the surrounding vegetation rather than that of being a unique habitat. Where the dry streams occur as a unique habitat, they consist of a sandy or rocky bed, often unvegetated or sparsely vegetated, bordered by a line of shrubs or small thorn trees. As the stream beds get larger, the riparian fringe becomes more pronounced, often developing an almost impenetrable margin of thorn trees. There is a continuum from the smallest streams to the larger “rivers”.

This is also equivalent to the area described as Association 6: *Vachellia karroo* drainage lines by EKOTRUST CC (2018) in the assessment report for the proposed development of the 325MW Kudusberg Wind Energy Facility, the study area of which partially overlaps with the current site.

The riparian areas have a species composition and structure that is almost completely different to the surrounding landscape. The habitat contains a combination of bare rock and deeper sands, so it is able to support a flora that is adapted to these substrate conditions, in addition to the sporadic flooding and scouring that takes place in these habitats as a result of rare large rainfall events. The thorn trees (and other shrubs) occur here because they can root deeply to access underground water, a source that is not available to other terrestrial habitats. Although not necessarily floristically sensitive, the habitat that is derived under these ecological conditions is critically important for fauna, providing food and shelter as well as corridors for undetected movement. In times of drought, riparian areas may offer the only slightly green vegetation as a source of food. The deeper sands are important for burrowing animals and the shrubs and low trees offer shelter and browse.

Riparian habitats are disproportionately important in terms of the proportion of the area that they occupy in the landscape – they probably occupy 5-10% of the landscape in total but provide a unique and important habitat for both flora and fauna. The plant species occurring within these habitats are not necessarily rare in a global sense, but degradation of this interconnected system can cause floristic loss and change in areas far removed from any impact. Maintenance of regional vegetation patterns therefore is dependent on maintaining the health and functionality of this component of the landscape. For this reason, and for the utilitarian importance to fauna, the riparian vegetation is considered to be ecologically sensitive. In addition, if there is any likelihood of the Riverine Rabbit occurring on site then this is the habitat in which it would be found.

Wetland

There are small localised patches within the riverbed where the plant species composition was interpreted as being a wetland. This included stands of *Phragmites australis*, *Pseudoschoenus inanis* and *Juncus* species, which are typical wetland species. These patches are located in depressions in the riverbed, either formed due to a rock shelf creating an upstream “pond” or where water flow has dug out a depression. The habitat is probably dynamic, shifting after heavy water flow, but is a consistent element of the river ecosystem. Due to the limited occurrence of this habitat and the arid region in which the site is located, it is assumed that it is a rare habitat on site and therefore treated as sensitive.

6.7.2 *Habitat Sensitivity*

To determine sensitivity on-site, local and regional factors were taken into account. There are some habitats on-site that have been described as sensitive in their own right, irrespective of regional assessments. This includes primarily the dry stream beds and associated riparian zones and adjacent floodplains however a detailed assessment of these areas has been undertaken by an aquatic specialist. Rocky outcrops and steep slopes, especially at higher elevations are more sensitive than surrounding areas, mainly due to higher floristic diversity and the likelihood of plant species with low local abundance occurring there.

In terms of other species of concern, including both plants and animals, there are no specific locations where conservation of habitat would benefit a specific species based on the existing data available. Both reptile species of concern, all mammal species of concern and all protected plant species described previously could occur on any part of the site, whether in the mountains or on the lowlands.

A summary of sensitivities that occur on site and that may be vulnerable to damage from the proposed project are as follows:

1. Dry stream beds, including the associated riparian habitats and adjacent floodplains;
2. Rock outcrops; and
3. Very steep slopes.

6.8 **Agriculture and Soils**

The Agricultural and Soils Compliance statement²⁸ was conducted by Johann Lanz (**Appendix 6A**) (**SACNASP registration: [400268/12](#)**). The Compliance Statement dated 02 November 2020 is provided in **Appendix 6A**. It should be noted that document adheres to the process and content requirements of the gazetted agricultural protocol.

The environmental baseline from an agricultural and soils perspective is presented below.

6.8.1 *Agricultural Land Use*

The area is a sheep and game farming area. Low density, natural grazing is by far the predominant agricultural activity in the area. The climate does not support cultivation without irrigation. Grazing capacity of the site varies from low at 45ha per large stock unit in the north east to very low at 90ha per large stock unit in the south west.

There are existing wind farms in close proximity to the proposed power line and substations.

6.8.2 *Site Sensitivity Verification*

²⁸ Protocol for the specialist assessment and minimum report content requirements of environmental impacts on agricultural resources by onshore wind and/or solar photovoltaic energy generation facilities where the electricity output is 20 megawatts or more, gazetted on 20 March 2020 (Sections 24(5)(A) and (H) and 44 of NEMA, 1998).

In terms of the gazetted agricultural protocol (GN 320), a site sensitivity verification must be submitted that:

- confirms or disputes the current use of the land and the environmental sensitivity as identified by the screening tool, such as new developments or infrastructure, the change in vegetation cover or status etc.; and
- contains a motivation and evidence (e.g. photographs) of either the verified or different use of the land and environmental sensitivity.

Agricultural sensitivity, in terms of environmental impact, is a direct function of the capability of the land for agricultural production. This is because a negative impact, or exclusion of agriculture, on land of higher agricultural capability is more detrimental to agriculture than the same impact on land of low agricultural capability.

The screening tool classifies agricultural sensitivity according to two criteria - the cultivation status and the land capability. All cultivated land is classified as high sensitivity (or very high sensitivity). This is because there is a scarcity of arable production land in South Africa, in terms of how much is required for food security.

Uncultivated land is classified by the screening tool in terms of the land capability. Land capability is defined as the combination of soil, climate and terrain suitability factors for supporting rain fed agricultural production. It is an indication of what level and type of agricultural production can sustainably be achieved on any land. The higher land capability classes are suitable as arable land for the production of cultivated crops, while the lower suitability classes are only suitable as non-arable, grazing land, or at the lowest extreme, not even suitable for grazing. In 2017 DAFF released updated and refined land capability mapping across the whole of South Africa. This has greatly improved the accuracy of the land capability rating for any particular piece of land anywhere in the country. The new land capability mapping divides land capability into 15 different categories with 1 being the lowest and 15 being the highest. This land capability data is used by the screening tool.

The proposed site is identified by the screening tool as being of predominantly low sensitivity for agricultural resources, but it also includes areas of medium sensitivity. A map of the proposed development area overlaid on the screening tool sensitivity is given in **Figure 17** below.

The agricultural capability of all land in the study area is severely constrained by the aridity of the climate. It is further constrained by shallow, sandy soils on underlying rock or hard-pan carbonate.

The differences in land capability across the project area are largely a function of terrain, but also of how the land capability data is generated. They are not very significant in terms of actual meaningful differences in agricultural potential on the ground.



Figure 17: The total footprint of all the development alternatives, including substations, overlaid on agricultural sensitivity, as given by the screening tool

The agricultural sensitivity, as identified by the screening tool, is confirmed by this assessment. The motivation for confirming the sensitivity is predominantly that the climate data (low rainfall of approximately 140mm per annum and high evaporation of approximately 1,600mm per annum) proves the area to be arid, and therefore of limited land capability. In addition, the land type data shows the dominant soils to be shallow, sandy soils on underlying rock or hard-pan carbonate. The land of the study area, therefore, without doubt, corresponds to the definitions of the different screening tool sensitivity categories in terms of its land capability and cultivation status.

The protocol requirement of doing a site sensitivity verification for agriculture, particularly where climate is the predominant agricultural limitation, is nonsensical because there is only one (1) way in which a sensitivity category different from that of the screening tool could possibly be arrived at. The only way in which sensitivity in the field could differ from the screening tool, and therefore need verification, is if new cultivated lands had recently been established on the site. In an area where the soils, climate and water availability are known to be completely unsuitable for cultivation, this is an impossibility.

Agricultural sensitivity of a particular development is also a function of the severity of the impact which that development poses to agriculture. This is not recognised in the screening tool, but is relevant for transmission lines, because the impact is negligible (see impact assessment section), even on areas identified by the screening tool as being of high agricultural sensitivity for impacts on agricultural resources, such as cultivated lands.

6.9 Surface Water

The Surface Water Impact Assessment was conducted by Christel du Preez of Freshwater Ecologist Network (FEN) Consulting (Pty) Ltd. (**Appendix 6E**). In preparation for the field assessment, aerial photographs, digital satellite imagery and provincial and national watercourse databases (as outlined in Section 5.1 of the Surface Water Impact Assessment Report – **Appendix 6E**) were used to identify points of interest associated with the proposed development at a desktop level. These points of interest were verified during the site assessment undertaken on the 22nd to 24th of October 2020 and detailed in the report which is provided in **Appendix 6E**.

The environmental baseline from a surface water perspective is presented below.

6.9.1 Description of the aquatic environment

6.9.1.1 National and Provincial Datasets

The following section contains data accessed as part of the desktop assessment and presented as a “dashboard-style” report below (**Table 18**). The dashboard report aims to present concise summaries of the data on as few pages as possible in order to allow for integration of results by the reader to take place. Where required, further discussion and interpretation are provided.

It is important to note that although all data sources used provide useful and often verifiable, high-quality data, the various databases used do not always provide an entirely accurate indication of the actual site characteristics associated with the proposed development at the scale required to inform the environmental authorisation and/or water use authorisation processes. Given these limitations, this information is considered useful as background information to the study, is important in legislative contextualisation of the risks and impacts, and was thus used as a guideline to inform the assessment and to focus on areas and aspects of increased conservation importance during the field survey. It must, however, be noted that field verification of key areas may potentially contradict the information contained in the relevant databases, in which case the site verified information must carry more weight in the decision-making process.

Table 18: Desktop data relating to the characteristics of watercourses associated with the investigation area

Aquatic ecoregion and sub-regions in which the investigation area are located			Detail of the investigation area in terms of the National Freshwater Ecosystem Priority Area (NFEPA) (2011) database	
Ecoregion	Great Karoo		FEPACODE (Figure 19)	The south western portion of the investigation area (proximity of alternative 1 and 5 of the Oya to Kappa power line alternatives) falls within a sub quaternary catchment indicated to be a FEPA. The southern portion of the investigation area is situated with an Upstream Management Catchment, required to prevent the downstream degradation of FEPAS and Fish Support Areas.
Catchment	Olifants - Cape			
Quaternary Catchment (Figure 3)	E22D, E22E, E23G, E23H, E22B, E23A			
WMA	Olifants/ Doorn			
subWMA	Doring			
Dominant characteristics of the Great Karoo Ecoregion Level II (21.03) (Kleynhans et al., 2007)			NFEPA Wetlands	According to the NFEPA (2011) database, four artificial wetlands are situated within the investigation area. These range from channelled valley bottoms, unchannelled valley bottoms, wetland flats and valley head seeps. The majority of these wetlands were artificial and considered to be in a heavily to critically modified (Class DEF) ecological condition. During the field investigation, these features were identified as artificial impoundments.
Level II Code	21.03	21.02		
Dominant primary terrain morphology	Low Mountains, Parallel Hills and Lowlands, Mountains and Lowlands.	Plains.	Wetland Vegetation Type	The investigation area is indicated to fall within the Rainshadow valley Karoo (Critically Endangered) and Karoo Shale Renosterveld (Least Threatened) Wetland Vegetation Type, Mbona et al. (2015).
Dominant primary vegetation types	Great Nama Karoo, Escarpment Mountains Renosterveld, Upland Succulent Karoo, Upper Nama Karoo.	Lowland Succulent Karoo, Upland Succulent Karoo, Central Mountain Renosterveld.		
Altitude (m a.m.s.l)	500-1700 (limited)	500 - 1100	NFEPA Rivers (Figure 20)	According to the NFEPA database, the proposed development crosses the Brak, Muishonds, Groot and Ongeluks River. According to the NFEPA dataset and the PES (1999) Classification, the Brak, and Ongeluks Rivers are indicated to be in a moderately modified (Class C) ecological condition whilst the Muishond River is indicated to be in a Largely natural (Class AB) and moderately modified ecological condition according to both databases respectively.
MAP (mm)	100 to 300	100 - 400		
The coefficient of Variation (% of MAP)	30 to 40	30 - 40		
Rainfall concentration index	30 to 55	45 - >65		
Rainfall seasonality	Very late summer, Winter	Winter		
Mean annual temp. (°C)	14 - 18	16 - 20		
Winter temperature (July)	0 - 18	2 - 20		
Summer temperature (Feb)	10 - 30	12 - > 32		
Median annual simulated runoff (mm)	<5 - 20	<5 - 80		
Importance of the investigation area according to the Western Cape Biodiversity Spatial Plan (2017) (Figure 21)				
According to the Western Cape Biodiversity Spatial Plan (2017), several areas within the investigation area are classified as Critical Biodiversity Areas (CBA) 1, of terrestrial ecological importance. CBA 1 areas are areas in a natural condition that are required to meet biodiversity targets, for species, ecosystems or ecological processes and infrastructure, in this case specifically for riverine environments. CBA 1 are areas likely to be in a natural condition. In addition, several areas associated with the southern portion of the investigation area (alternatives 1, 2 and 5) are classified as CBA 2. CBA 2 areas are areas in a degraded of secondary condition that are required to meet biodiversity targets for species, ecosystems or ecological processes and infrastructure.				

In addition, several areas within the investigation area are considered to be Ecological Support Areas (ESAs) 1 (of aquatic importance). ESAs are important in supporting the functioning of CBAs and are often vital for delivering ecosystem services. ESA 1 are areas in a natural condition that are required to meet biodiversity targets, for species, ecosystems or ecological processes and infrastructure. In addition, several areas within the investigation area of the Oya to Kappa substation power line alternatives were classified as ESA 2. ESA 2 are areas that are not essential for meeting biodiversity targets, but that play an important role in supporting the functioning of protected areas (PAs) or CBAs and are often vital for delivering ecosystem services. Large areas that are to be traversed by the Oya to Kappa substation power line alternatives are also considered to be Other Natural Areas (ONAs). These are areas that have not been identified as a priority in the current systematic biodiversity plan but retain most of their natural character and perform a range of biodiversity and ecological infrastructure functions. Although they have not been prioritised for biodiversity, they are still an important part of the natural ecosystem.

Importance of the investigation area according to the Critical Biodiversity Areas of the Northern Cape (2016) (Figure 22)

According to the Critical Biodiversity Areas of the Northern Cape (2016), the northern portion of the investigation area falls within areas classified as Ecological Support Areas (ESAs) and Other Natural Areas (ONAs). ESAs are areas that are not essential for meeting biodiversity targets but, play an important role in supporting the ecological functioning in Critical Biodiversity Areas (CBAs). ONAs are areas that have not been identified as a priority in the current systematic biodiversity plan but retain most of their natural character and perform a range of biodiversity and ecological infrastructure functions. Although they have not been prioritised for biodiversity, they are still an important part of the natural ecosystem.

National Web Based Environmental Screening Tool (2020): Aquatic Biodiversity sensitivity

A portion within the south of the investigation area is located within areas considered of high aquatic biodiversity sensitivity as a result of potential aquatic CBAs and rivers that may be traversed by the proposed development.

National Biodiversity Assessment (2018): South African Inventory of Inland Aquatic Ecosystems (SAIIAE) (National Wetland Map 5 is included in the NBA)

According to the NBA 2018: SAIIAE Wetland Map 5, there are no wetlands situated within the investigation area or traversed by the proposed development.

The rivers as per the NFEPA Rivers (as per Figure 5) are proposed to be traversed by the proposed development. The Groot River is considered to be in a largely modified (Class D) ecological condition and the EPL and ETS is poorly protected and least threatened. The Adamskraal River is considered to be unmodified (Class A) and the EPL and ETS is poorly protected and least threatened. The Muishond River traverses the central portions of the investigation area surrounding the Oya to Kappa power line substation alternatives and is considered to be unmodified with an EPL and ETS of poorly protected and least threatened, respectively. The Kudusberg to Oya power line crosses the Ongeluks and Brak Rivers. The Ongeluks River exhibited a largely natural ecological condition (Class B), whilst the Brak River was considered to be unmodified (Class A) with both rivers displaying a EPL and ETS of poorly protected and least threatened.

CBA = Critical Biodiversity Area; DWS = Department of Water and Sanitation; EI = Ecological Importance; ES = Ecological Sensitivity; ESA = Ecological Support Area; m.a.m.s.l = Metres Above Mean Sea Level; MAP = Mean Annual Precipitation; NBA = National Biodiversity Assessment; NFEPA = National Freshwater Ecosystem Priority Areas; PES = Present Ecological State; SAIIAE = South African Inventory of Inland Aquatic Ecosystems; WMA = Water Management Area

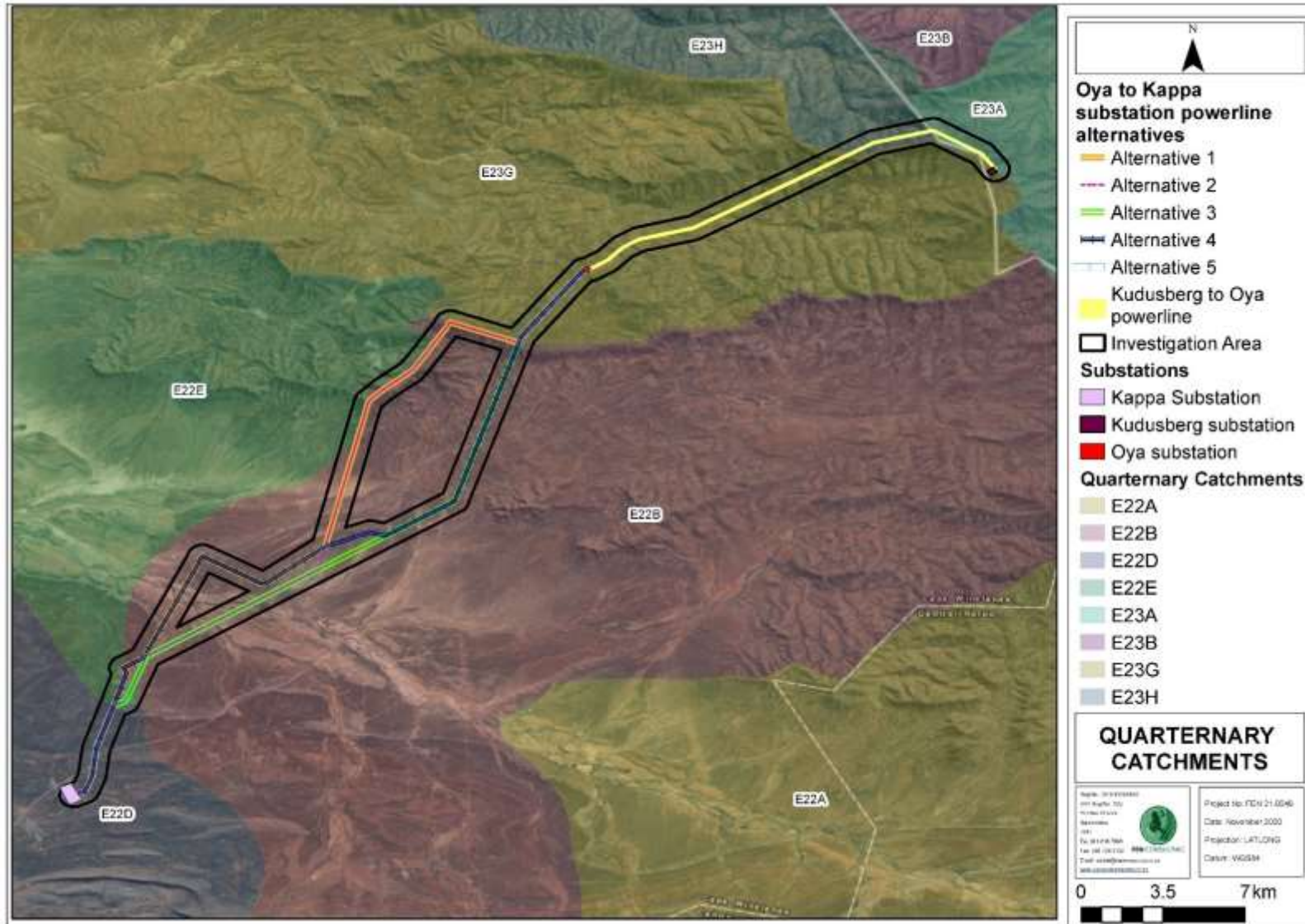


Figure 18: Quaternary catchments associated with the proposed development and associated investigation area

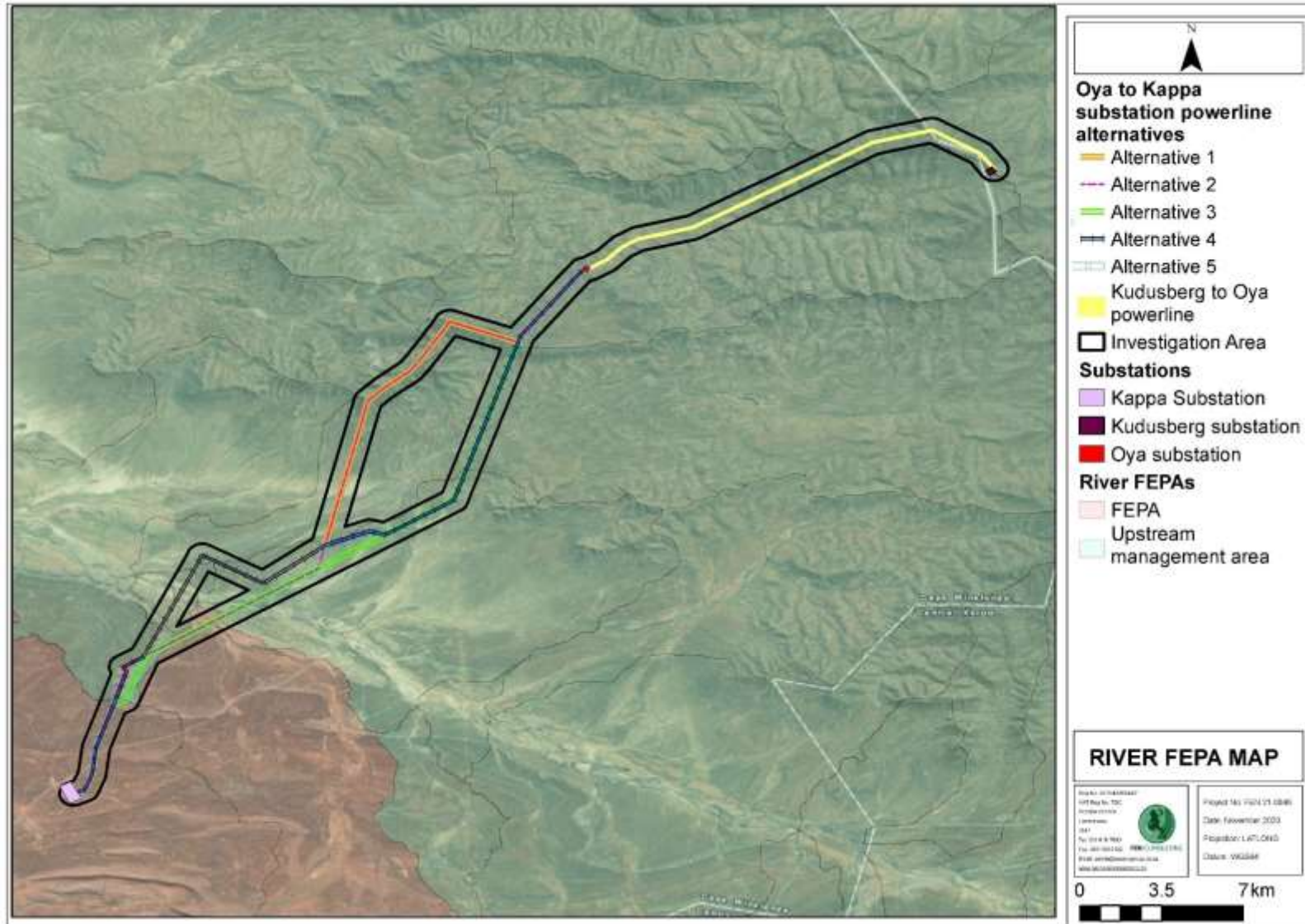


Figure 19: River FEPAs associated with the proposed development and associated investigation area according to the NFEPA (2011) database

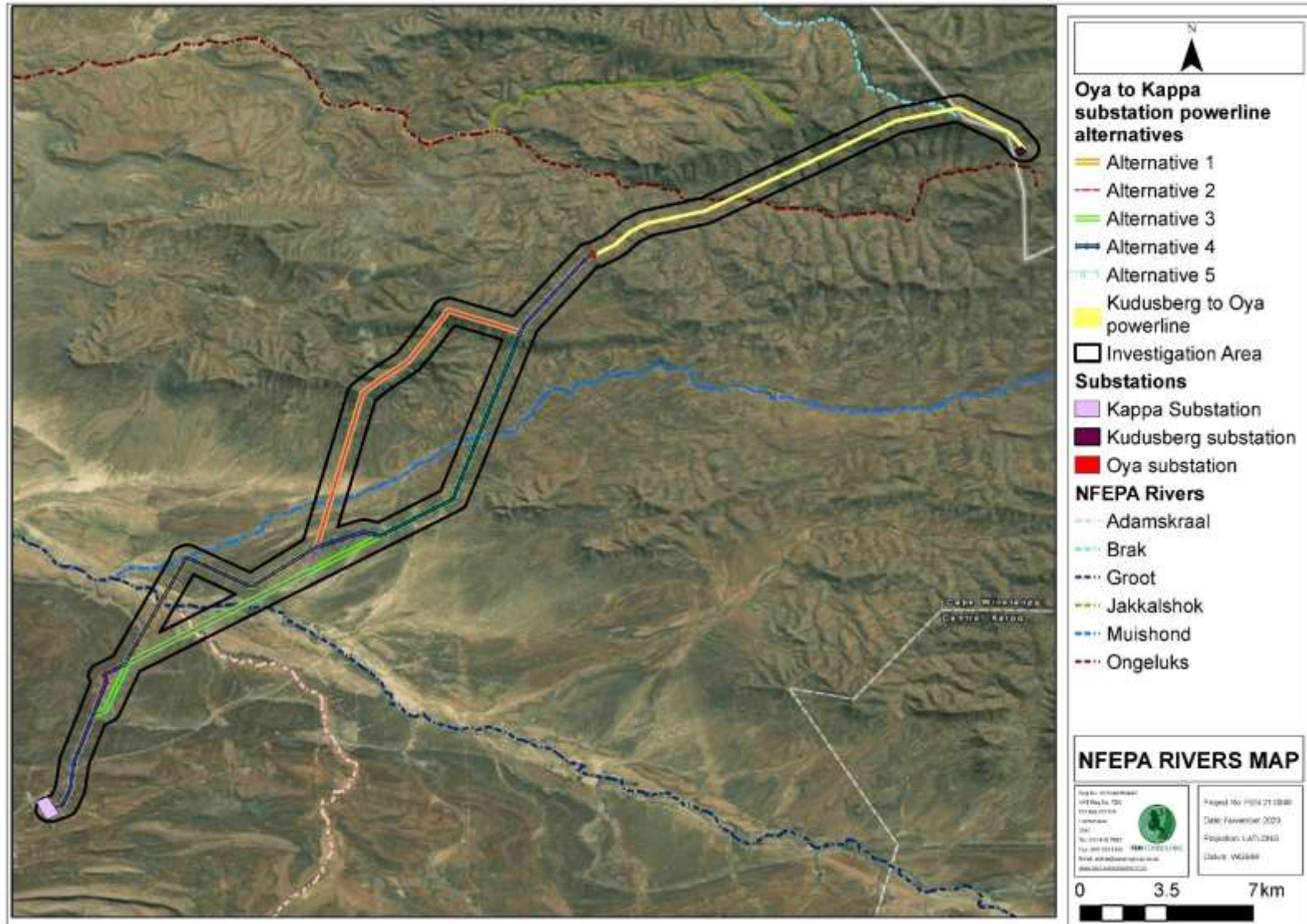


Figure 20: Rivers associated with the proposed development and associated investigation area according to the NFEPA (2011) database

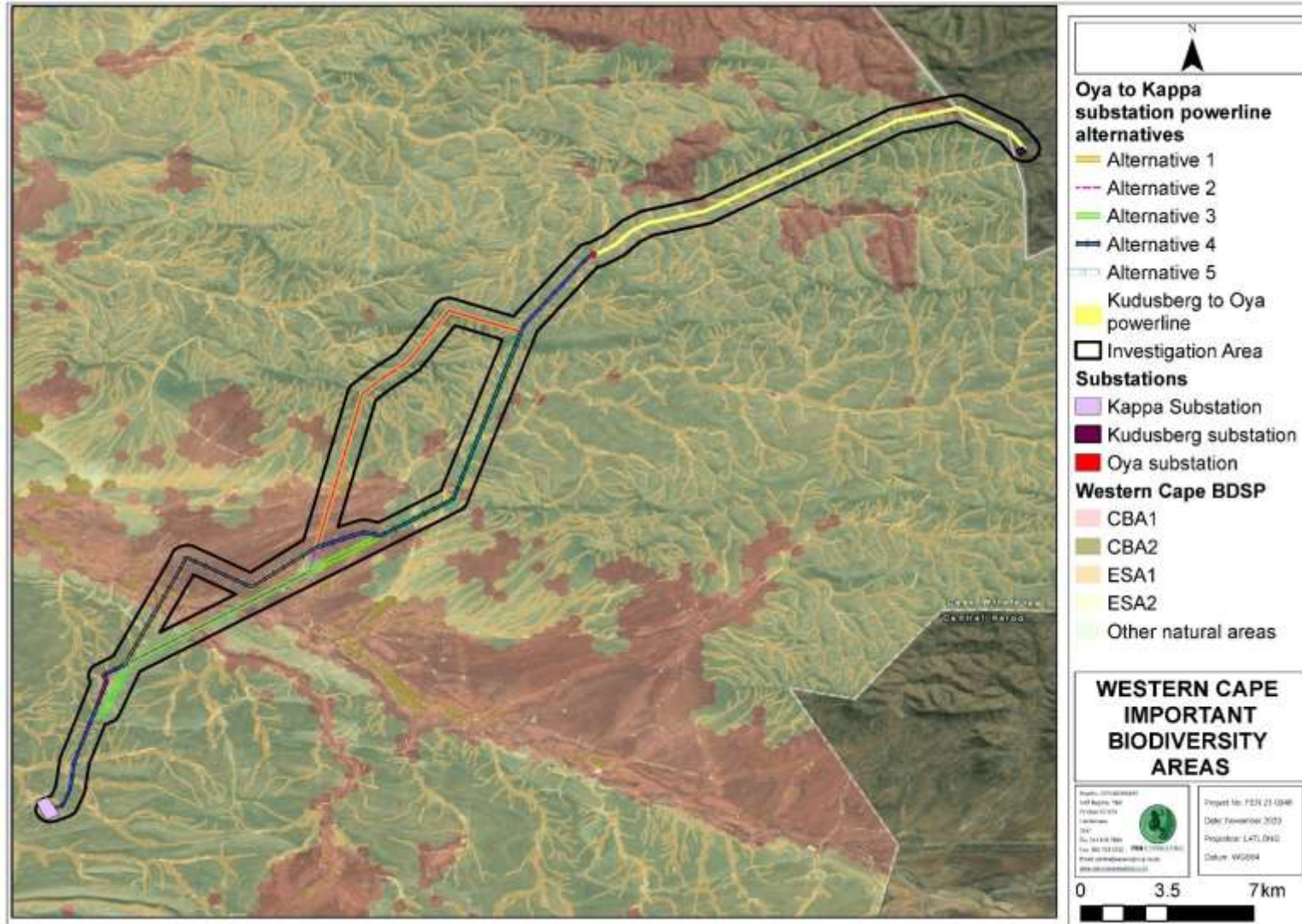


Figure 21: The areas of biodiversity importance associated with the proposed development and investigation area, according to the Western Cape Biodiversity Spatial Plan (2017)

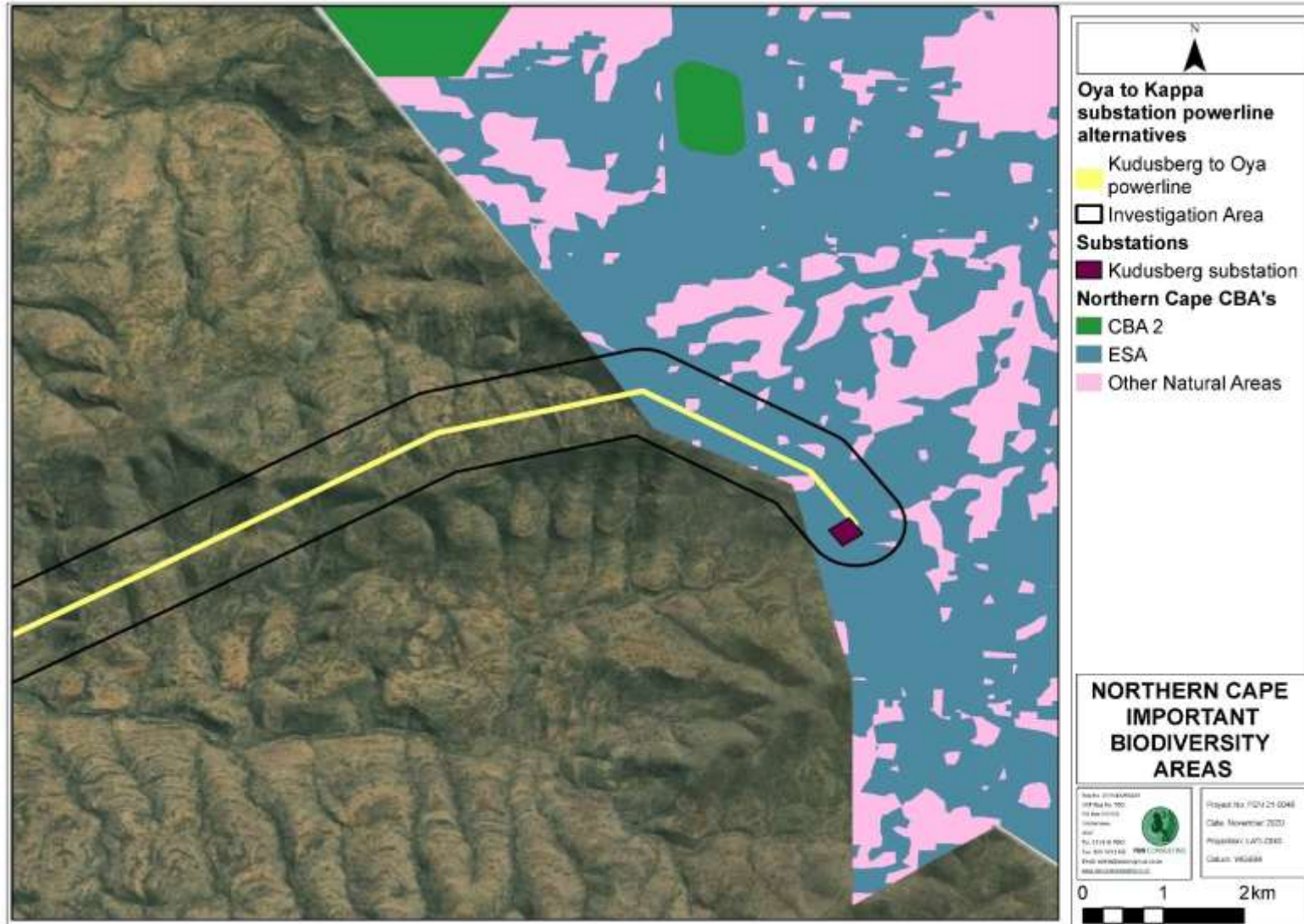


Figure 22: The areas of biodiversity importance associated with the proposed development according to the Critical Biodiversity Areas of the Northern Cape (2016) database

6.9.2 Ecological Status of Sub-Quaternary Catchments [Department of Water and Sanitation (DWS) Resource Quality Services (RQS) PES / EIS Database]

The Present Ecological State (PES) / Ecological Importance and Sensitivity (EIS) database, as developed by the DWS RQIS department was utilised to obtain additional background information on the project area. The information from this database is based on information at a sub-quaternary catchment reach (SQR) level. Descriptions of the aquatic ecology is based on information collated by the DWS RQIS department from available sources of reliable information, such as the South Africa River Health Programme (SA RHP) sites, Ecological Water Requirements (EWR) sites and Hydro Water Management System (WMS) sites.

Key information on invertebrates and background conditions associated with the SQRs E23H-07869 (Brak River), E23G-08076 (Ongeluks River), E22B – 08293 (Adamskraal River); E22B–08237 and E22B-8274 (Groot River) and E22B-08134 (Muishond River) as contained in this database and pertaining to the PES and EIS are tabulated in **Table 19** and **Table 20** and visually represented in **Figure 23** that follows.

Table 19: Invertebrates previously collected from or expected at the SQR monitoring points

Macro-Invertebrates	E23H-07869 (Brak River)	E23G-08076 (Ongeluks River)	E22B – 08293 (Adamskraal River); E22B - 08237 and E22B-8274 (Groot River) and E22B-08134 (Muishond River)
Aeshnidae	X	X	X
Ancylidae	X		
Baetidae 1 Sp	X	X	
Baetidae 2 Sp			X
Belostomatidae	X	X	
Ceratopogonidae	X		X
Caenidae	X	X	
Chironomidae	X		X
Coenagrionidae	X	X	X
Corduliidae	X	X	X
Corixidae	X	X	X
Culicidae	X		X
Dytiscidae	X		X
Elmidae			X
Gerridae	X	X	X
Gomphidae			X
Gyrinidae	X		X
Hydracarina	X	X	X
Hirudinea			X
Hydrometridae			
Hydrophilidae			
Hydropsychidae 2 sp.			X
Leptoceridae			X
Lestidae	X	X	
Libellulidae	X	X	X
Lymnaeidae	X		X
Muscidae	X		
Naucoridae			X
Notonectidae	X	X	X
Oligochaeta	X	X	X
Physidae	X		
Pleidae	X	X	X
Simuliidae	X		X
Turbellaria			X
Veliidae/Mesoveliidae	X	X	X

Table 20: Summary of the ecological status of the sub-quaternary catchment (SQ) reaches associated with the proposed development based on the DWS RQS PES/EIS database

	E22B- 08293 (Adamskraal River)	E23H-07869 (Brak River)	E22B-8274 and E22B – 08237 (Groot River)	E23G-08076 (Ongeluks River)	E22B-08134 (Muishond River)
Synopsis					
PES Category Median	Natural/Close to natural	Natural/Close to natural	Natural/Close to natural	Unmodified, natural	Natural/Close to natural
Mean EI class	High	High	High	High	High
Mean ES class	High	Very High	High	Very High	Very High
Length	23.58	39.38	10.07	22,3	44.03
Stream order	1	1	2	1	1
Default EC⁴	B (High)	A (Very High)	B (High)	A	A (Very High)
PES Details					
Instream habitat continuity MOD	None	None	None	None	None
RIP/wetland zone continuity MOD	Small	Small	Small	Small	Small
Potential instream habitat MOD activities	None	None	None	None	None
Riparian/wetland zone MOD	None	None	None	None	None
Potential flow MOD activities	Small	Small	Small	Small	Small
Potential physico-chemical MOD activities	None	None	None	None	None
EI Details					
Fish spp/SQ	-	-	-	-	-
Fish average confidence	-	-	-	-	-
Fish representivity per secondary class	-	-	-	-	-
Fish rarity per secondary class	-	-	-	-	-
Invertebrate taxa/SQ	28	25	28	25	28
Invertebrate average confidence	1	3	1	3	1
Invertebrate representivity per secondary class	Moderate	Moderate	Moderate	Moderate	Moderate
Invertebrate rarity per secondary class	High	High	High	High	High
EI importance: riparian-wetland-instream vertebrates (excluding fish) rating	Very Low	Moderate	Very Low	Very Low	Very Low
Habitat diversity class	Moderate	Moderate	Very Low	Low	Moderate
Habitat size (length) class	Moderate	High	Very Low	Moderate	Very High
Instream migration link class	Very High	Very High	Very High	Very High	Very High
Riparian-wetland zone migration link	Very High	Very High	Very High	Very High	Very High
Riparian-wetland zone habitat integrity class	Very High	Very High	Very High	Very High	Very High
Instream habitat integrity class	Very High	Very High	Very High	Very High	Very High
Riparian-wetland natural vegetation rating based on percentage natural vegetation in 500m	Very High	Very High	Very High	Very High	Very High

	E22B- 08293 (Adamskraal River)	E23H-07869 (Brak River)	E22B-8274 and E22B – 08237 (Groot River)	E23G-08076 (Ongeluks River)	E22B-08134 (Muishond River)
Riparian-wetland natural vegetation rating based on expert rating	Very High	Very High	Very High	Very High	Very High
ES Details					
Fish physical-chemical sensitivity description	-	-	-	-	-
Fish no-flow sensitivity	-	-	-	-	-
Invertebrates physical- chemical sensitivity description	Moderate	Moderate	Moderate	Moderate	Moderate
Invertebrates velocity sensitivity	Very High	High	Very High	High	Very High
Riparian-wetland- instream vertebrates (excluding fish) intolerance water level/flow changes description	Very Low	Very High	Very Low	Very High	Very High
Stream size sensitivity to modified flow/water level changes description	Very High	Very High	Very High	High	Very High
Riparian-wetland vegetation intolerance to water level changes description	Very High	Very High	Very High	Marginal and non-marginal species require seasonal flows	Very High

¹ PES = Present Ecological State; confirmed in database that assessments were performed by expert assessors;

² EI = Ecological Importance;

³ ES = Ecological Sensitivity

⁴ EC = Ecological Category; default based on median PES and highest of EI or ES means.

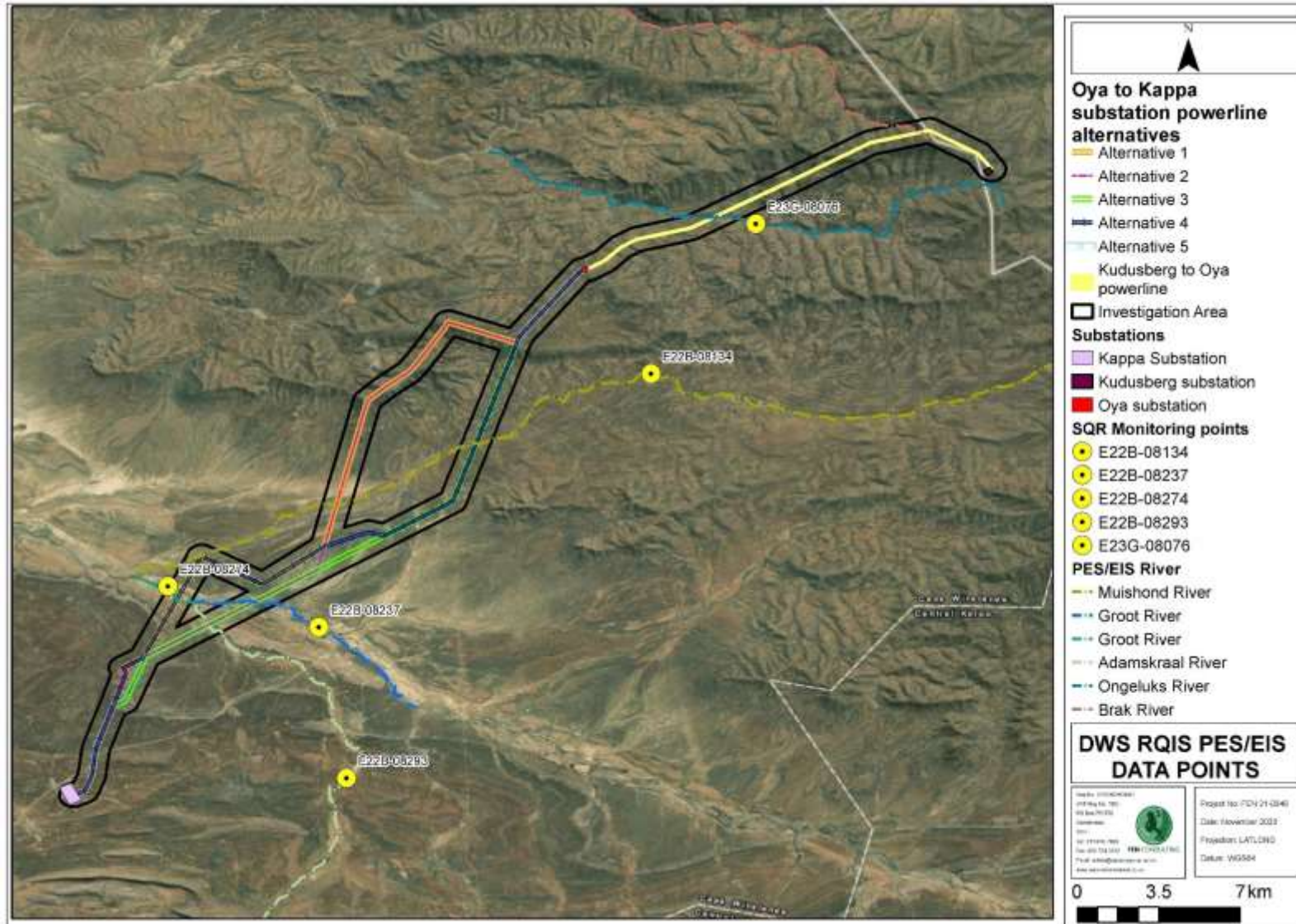


Figure 23: DWS RQIS PES/EIS sub-quaternary catchment reaches (SQRs) indicated relative to the proposed development and investigation area

6.9.2.1 Results of field verification and delineation

In preparation for the field assessment, aerial photographs, digital satellite imagery and provincial and national watercourse databases (as outlined in Section 5.1 of the Surface Water Impact Assessment Report) were used to identify points of interest associated with the proposed development at a desktop level. In this regard, specific mention is made of the following:

- **Linear features:** since water flows/moves through the landscape, watercourses often have a distinct linear element to their signature which makes them discernible on aerial photography or satellite imagery;
- **Vegetation associated with watercourses:** a distinct increase in density as well as shrub size near flow paths;
- **Hue:** with water flow paths often showing as white / grey or black and outcrops or bare soils displaying varying chroma created by varying vegetation cover, geology and soil conditions. Changes in the hue of vegetation with watercourse vegetation often indicated on black and white images as areas of darker hue (dark grey and black). In colour imagery these areas mostly show up as darker green and olive colours or brighter green colours in relation to adjacent areas where there is less soil moisture or surface water present; and
- **Texture:** with areas displaying various textures, created by varying vegetation cover and soil conditions.

These points of interest were verified during the site assessment undertaken on the 22nd to 24th of October 2020. The proposed development is located in the east largely on the higher-lying Oliviersberg and Koedoesberg Mountains, routed in the west through the topographical flat valley of the Groot River to where the Kappa substation is located. The proposed development crosses watercourses associated with the Brak, Ongeluks, Muishonds, Groot, Adamskraal, Karee and Kleinpoorts river systems.

The majority of watercourses identified within the investigation area can best be described as headwater episodic²⁹ drainage lines (EDLs) without riparian vegetation which flow into larger ephemeral tributaries (with riparian vegetation) connected to larger ephemeral rivers. Although these EDLs cannot be classified as riparian resources in the traditional sense thereof due to the lack of saturated soils and riparian vegetation, they do still function as waterways, through episodic conveyance of water. However, based on the definition of a watercourse (see Section 1.4 of Surface Water Impact Assessment Report) water flows regularly or intermittently within these drainage lines, conveying water from the upgradient catchment area into the downgradient tributaries and eventually into the larger river systems. As such, they can be considered as watercourses due to their importance for hydrological functioning as they do function as waterways and therefore enjoy protection in terms of the NWA.

Several areas hosting episodic preferential flow paths (PFP) were also identified (**Figure 24**). As with the EDLs, these preferential flow paths also lack riparian and wetland characteristics and may potentially only convey surface water for a short period of time after rainfall events. Thus, these features are not considered of ecological importance but contributes to the hydrological functioning of the drainage systems at large. The PFP cannot be considered as watercourses (thus no ecological assessment undertaken) and may potentially only enjoy protection in terms of the NWA should a floodline be applicable to these features. Due to the extent of these small PFPs, they were not mapped or delineated – however specific areas where extensive PFP were noted are indicated on the delineation maps (**Figure 26**).

²⁹ “Highly flashy systems that flow or flood only in response to extreme rainfall events, usually high in their catchments. May not flow in a five-year period or may flow only once in several years.” (Uys and O’Keeffe, 1997, in Rossouw *et. al*, 2006)



Figure 24: Photographs of preferential surface flow paths associated with the Groot River drainage system

The seven (7) separate drainage systems identified within the investigation area relative to the proposed development is provided in **Table 21** below and visually depicted in **Figure 25** to **Figure 27**.

Table 21: Summary of the drainage systems identified relative to the proposed development

Drainage System	Locality	General description
Kleinpoorts River system (Figure 25).	Drainage system associated with the north eastern portion of the investigation area. The power line between the Kudusberg substation to Oya substation facility will traverse this drainage system.	Several small headwater EDLs are located within the investigation area to be traversed by the proposed development. These EDLs are considered to be in a largely natural ecological condition due to their remote locality.
Brak River system (Figure 25).	Drainage system associated with the north eastern portion of the investigation. The power line between the Kudusberg WEF to Oya energy facility will traverse this drainage system.	Several small headwater EDLs are located within the investigation area to be traversed by the proposed development. These EDLs are considered to be in a largely natural ecological condition due to their remote locality.
Ongeluk River system (Figure 25).	Drainage system associated with the northern portion of the investigation area. The central to southern portion of the power line between the Kudusberg WEF to Oya energy facility will traverse this drainage system. Power line alternative 5 proposed between the Oya energy facility substation to the Kappa substation will traverse this system.	This is the largest drainage system associated with the power line between the Kudusberg Substation to OyaSubstaion. The headwaters of this river system is located at the proposed substation locality (in the most far eastern portion of the investigation area). The proposed power line will subsequently cross EDLs, ephemeral tributaries and the Ongeluk River. The watercourses of this system located in the investigation area is predominantly largely natural with a few modifications specifically to some of the watercourses proposed to be crossed by the southern portion of the power line.
Muishonds River system (Figure 26)	Drainage system associated with the central portion of the investigation area. All proposed power line alternatives from the Oya energy facility substation to the Kappa substation will traverse this system.	This is the largest drainage system associated with the power line between the Oya energy facility substation to the Kappa substation. All proposed power line alternatives routes will traverse this drainage system. The headwaters of this river system, predominantly the EDLs, is located in the investigation area associated with power line alternatives 1, 2 and 5. Proposed power line alternatives 3 and 4 traverse the EDLs, tributaries and the Muishonds River.

Drainage System	Locality	General description
		The central portion of the investigation area (associated with all power line alternatives) traverse large areas consisting of episodic preferential flow paths (PFP).
Groot River system (Figure 26 and Figure 27)	Drainage system associated with the southern portion of the investigation area. All proposed power line alternatives from the Oya energy facility substation to the Kappa substation traverse this system.	All proposed power line alternatives cross this drainage system, which consist of the Groot River and several EDLs. Due to the locality of this drainage system, being subjected to long term grazing, the watercourses has been modified to some extent.
Adamskraal River (Figure 26 and Figure 27)	Drainage system associated with the southern portion of the investigation area. Proposed power line alternatives 2, 3 and 5 from the Oya energy facility substation to the Kappa substation traverse this system.	An EDL and the Adamskraal River is traversed by the proposed power line alternatives 2, 3, and 5. The reaches of the watercourses located in the investigation area are considered to be in a largely natural ecological condition due to their remote locality.
Karee River (Figure 27)	Drainage system associated with the southern portion of the investigation area. All proposed power line alternatives from the Oya energy facility substation to the Kappa substation traverse this system.	Several EDLs and PFPs are traversed by the power line alternatives between the Oya energy facility substation to the Kappa substation. The reaches of the watercourses located within the investigation area are considered to be in a largely natural ecological condition due to their remote locality.

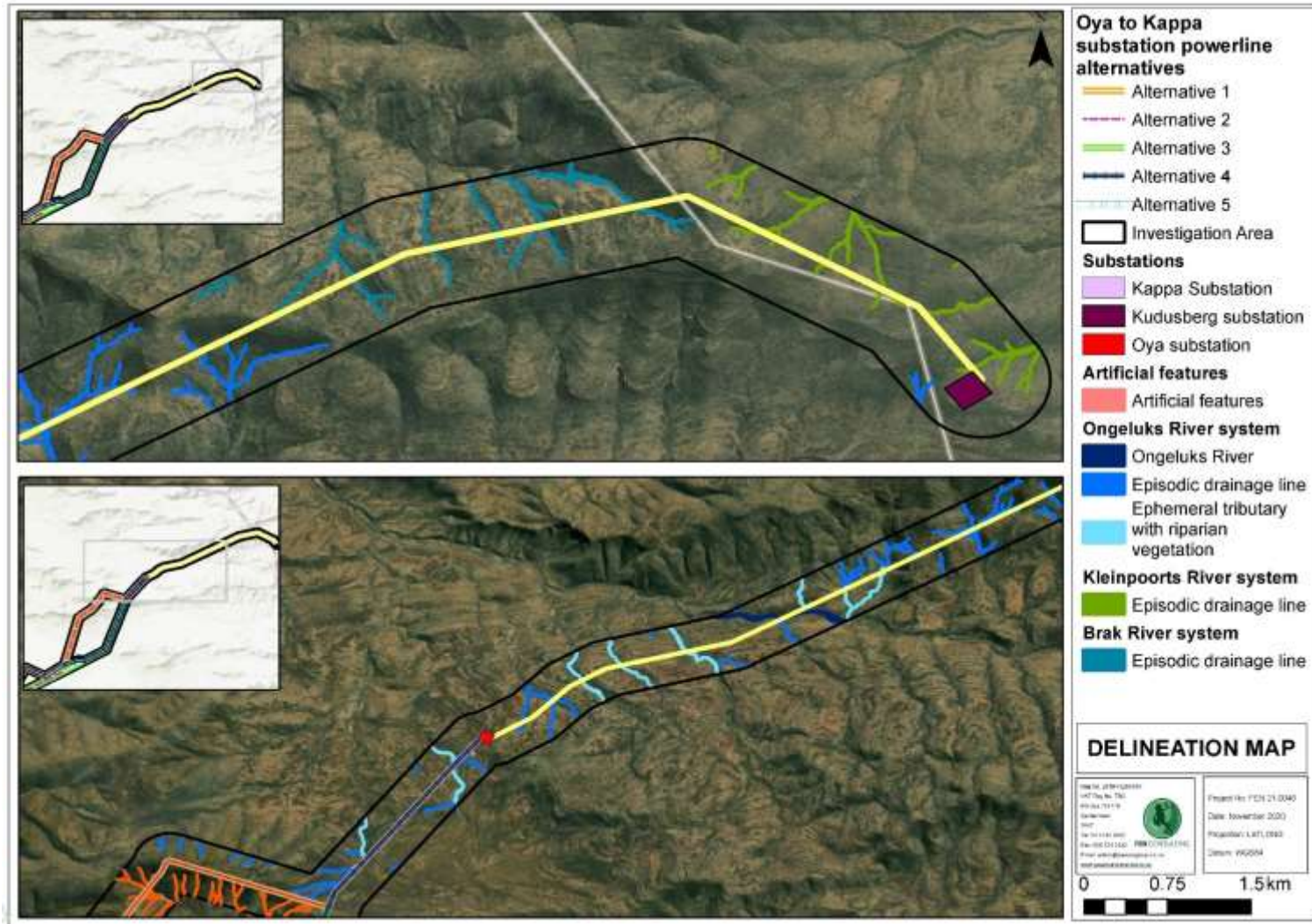


Figure 25: The locality of the delineated watercourses of the Kleinpoorts, Brak and Ongeluk River systems associated with the proposed development. Although the power line traverses watercourses, pylons will not be located within its delineated extent. Although the power line alternatives traverses watercourses, pylons will not be located within the watercourse delineated extent.

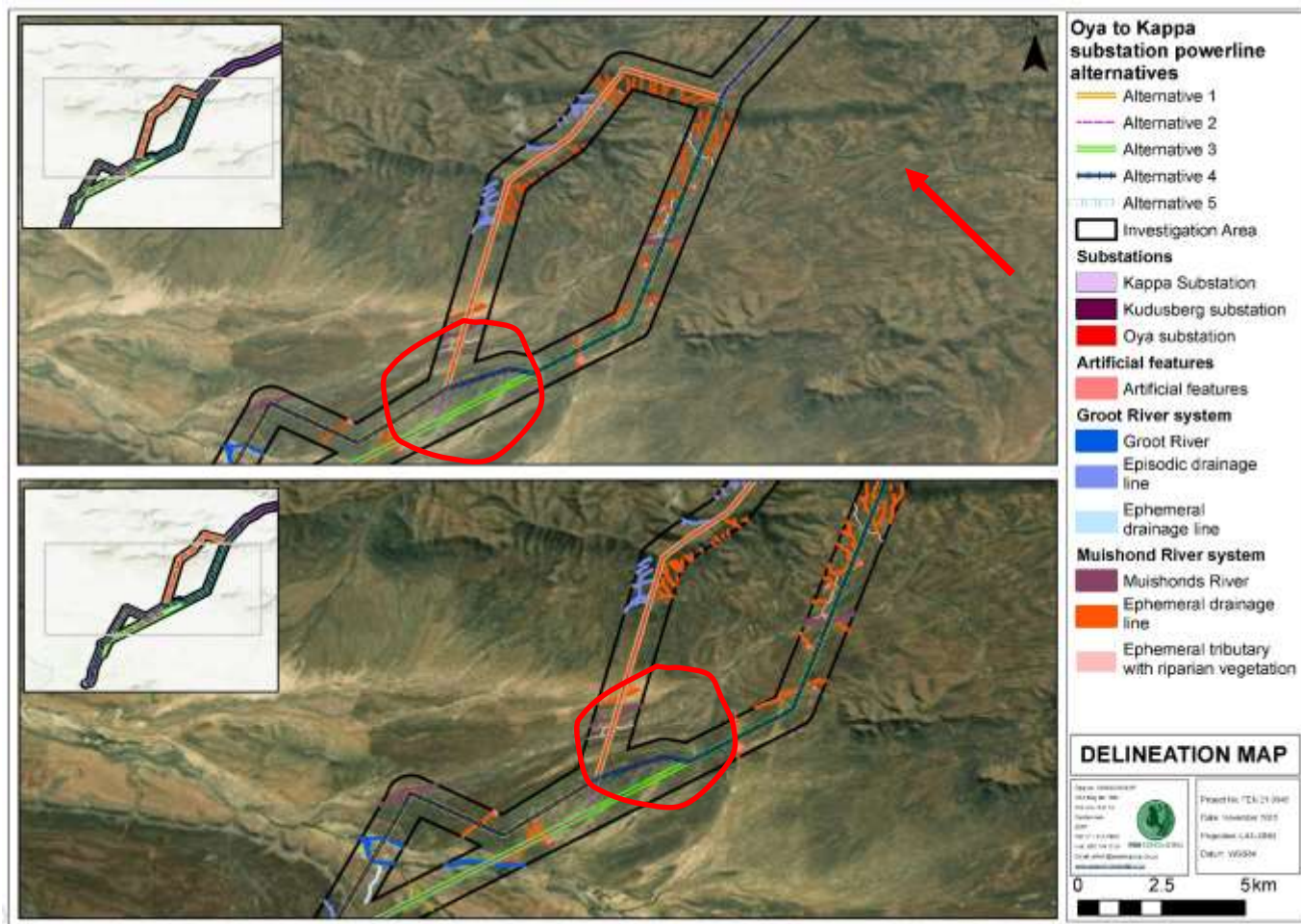


Figure 26: The locality of the delineated watercourses of the Adamskraal, Groot, and Muishond River systems associated with the proposed development. The red polygon indicates areas with preferential flow paths³⁰. Although the power line alternatives traverses watercourses, pylons will not be located within the watercourse delineated extent.

³⁰ Preferential flow paths also lack riparian and wetland characteristics and may potentially only convey surface water for a short period of time after rainfall events. Thus, these features are not considered of ecological importance but contributes to the hydrological functioning of the drainage systems at large. The PFP cannot be considered as watercourses and may potentially only enjoy protection in terms of the National Water Act, 1998 (Act No. 36 of 1998) should a floodline be applicable to these features.

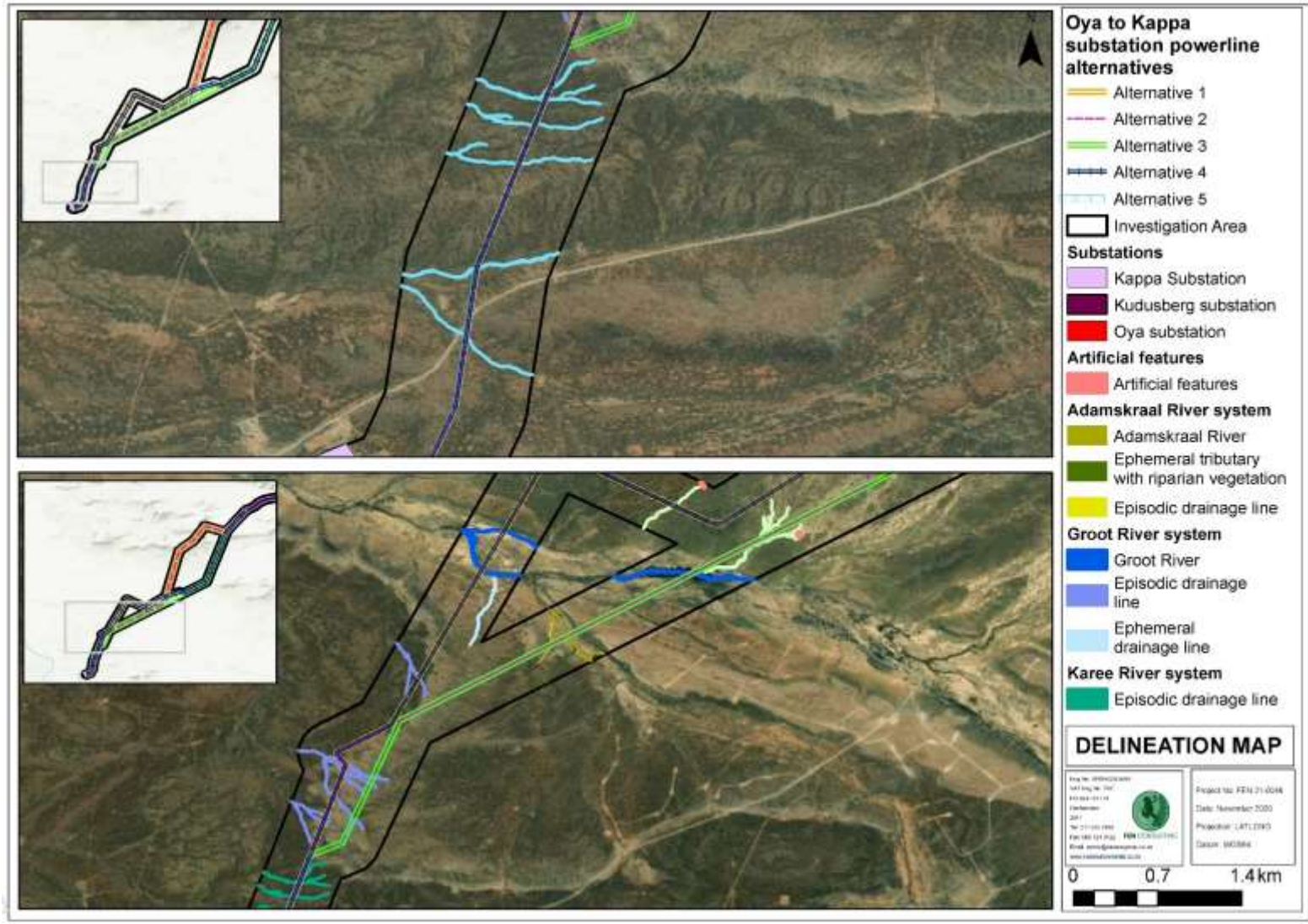


Figure 27: The locality of the delineated watercourses of the Groot and Karee River systems associated with the proposed development. Although the power line alternatives traverses watercourses, pylons will not be located within the watercourse delineated extent.

6.9.2.2 Watercourse Delineation

The outer boundary of the identified watercourses were delineated according to the guidelines advocated by DWAF (2008) taking into consideration soil characteristics as defined by Job (2009). The delineations as presented in this report are regarded as a best estimate based on the site conditions present at the time of the assessment. During the field assessment, the following indicators were used in order to determine the boundary of the riparian watercourses identified to be associated with the proposed power line and substations development and associated investigation area:

- **Topography / elevation** was used to determine which parts of the landscape watercourses are most likely to occur. Since watercourses occur where there is a prolonged presence of water in the landscape, the most common place one could expect to find watercourses is in the valley bottom position (DWAF, 2008). The main tributaries and rivers of the identified drainage systems are all located in the valley bottom position (**Figure 28**). Most other watercourses (like the smaller episodic drainage lines) are also located in valleys between undulating hills within the upslope that slopes towards the larger downstream system where concentration of flow leads to drainage towards the larger tributaries and rivers.



Figure 28: A photograph depicting the topographical setting of the smaller episodic drainage lines in the higher slope position (yellow dashed line) relative to the larger ephemeral tributaries or river in the valley bottom position (blue line)

- **Vegetation associated with riparian areas:** the identification of riparian areas relies heavily on vegetative indicators. Using vegetation, the outer boundary of a riparian area can be defined as the point where a distinctive change occurs:
 - in species composition relative to the adjacent terrestrial area; and

- in the physical structure, such as vigour or robustness of growth forms of species similar to that of adjacent terrestrial areas. Growth form refers to the health, density, crowding, size, structure and/or numbers of individual plants.

Only in the larger downstream ephemeral rivers and tributaries was a change in riparian vegetation identified from that of the terrestrial vegetation (**Figure 29**), where a mix of low tree and shrub species such as *Vahellia karroo*, *Searsia lancea*, *Lycium cinereum*, *Diospyros ausro-africana* and *Buddleja saligna* are prevalent. Trees and shrubs are less prominent along the rocky episodic drainage lines located in the upper reaches of the drainage systems (**Figure 29**).



Figure 29: Photographs depicting the vegetation component of the watercourses associated with the proposed development. (Left) the lower reaches of the ephemeral rivers host tree species (indicated by the yellow arrows) in its marginal zones, which can be easily distinguished from the surrounding terrestrial vegetation. (Right) the vegetation of the smaller episodic drainage line type watercourses is similar to that of the surrounding terrestrial areas

- **The presence of alluvial soils:** The presence of alluvial soils was used as an indicator of riparian zones, as defined by NWA. The occurrence of alluvial deposited material adjacent to the active channel is a good indicator of the riparian zone of a riparian watercourse (such as that of the identified river, tributaries and ephemeral drainage lines). Alluvial soils are soils derived from materials deposited by flowing water, especially in the valley bottom position. Riparian areas often, but not always, have alluvial soils (**Figure 30**). While the presence of alluvial soils cannot always be used as a primary indicator to delineate riparian watercourses accurately, it can be used in conjunction with the topographical and vegetative indicators. Unlike wetland areas, riparian zones are usually not saturated for a long enough period of time for redoximorphic features to develop. This is because riparian watercourses are mainly driven by flow, originating from its local catchment which flows through the watercourse and does not reside in the riparian watercourse as with wetlands. This is specifically true for ephemeral and episodic systems that experience flash flooding in response to rainfall events.



Figure 30: (Left) a shallow layer of alluvial soil is present in the active channel of this ephemeral tributary. (Right) the upper reaches of the tributaries and smaller episodic drainage lines have exposed bedrock, and only present with small isolated areas where alluvial soil is deposited

6.10 Avifauna

The Avifaunal Impact Assessment has been conducted by Chris van Rooyen and Albert Fronemann of Chris van Rooyen Consulting (**Appendix 6B**). A three-day on-site survey was conducted from 19 - 21 October 2020 to record the habitat in the study area, and to search for priority species nests. The surveys were conducted with a 4x4 vehicle and where necessary, on foot. The cliffs were inspected from several vantage points with a 60x spotting scope to search for nests. Information previously collected during various bird and power line surveys in the Kappa area in 2019 and 2020, including the pre-construction monitoring that was conducted at the proposed Oya Energy Facility was used to supplement the data collected during the site visit. The findings are detailed in the report (**Appendix 6B**).

6.10.1 Description of avifauna

6.10.1.1 Important Bird Areas

The Cedarberg - Koue Bokkeveld Complex Important Bird Area (IBA) SA101 is the closest IBA and is located approximately 30km west of the study area at its closest point. The development is not expected to have any impact on the avifauna in this IBA.

6.10.1.2 Protected Areas

The study area does not form part of a formally protected area. The closest protected area is the Inverdoorn Private Nature Reserve which is located approximately 13km away from the Kappa Substation at its closest point. The proposed development is not expected to impact on avifauna in the reserve.

6.10.1.3 DEFF Screening Tool

No specific protocol for avifauna were promulgated in GN 320 on 20 March 2020 as far as specialist studies for power lines are concerned. In such an instance, the specialist is required to undertake a site

sensitivity verification process, to determine if the site sensitivity allocated by the screening tool is accurate from an avifaunal perspective. See **Figure 31** below for the outcome of the screening process (Animal Species Theme).

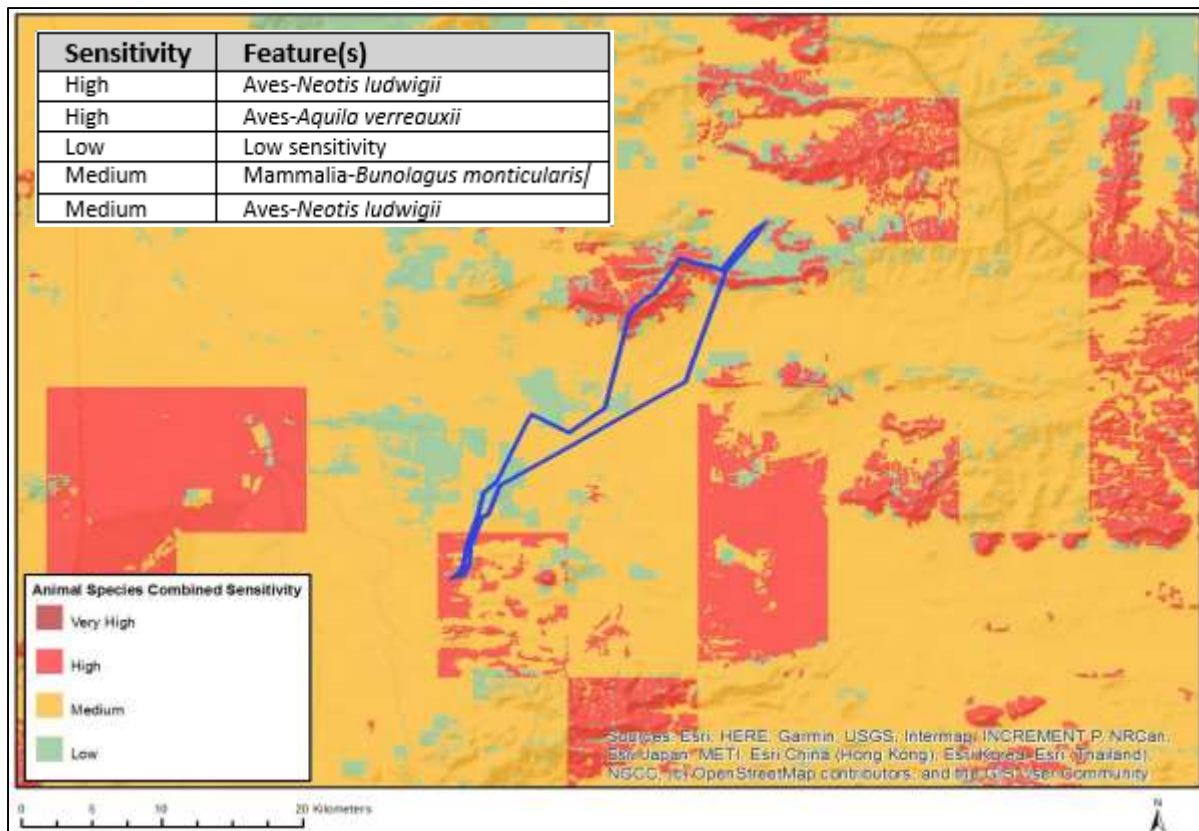


Figure 31: The outcome of the screening process for the proposed development: Animal Species Theme Sensitivity

The screening tool classifies the study area largely as Medium sensitivity due to the potential presence of Ludwig’s Bustard, with some sections classified as Very High sensitivity, due to the presence of Ludwig’s Bustard, and Verreaux’s Eagle. There are also a few low sensitivity areas. The sensitivity ratings of the screening tool were confirmed during the site visit from 19 – 21 October 2020. The study area contains suitable habitat for both Ludwig’s Bustard and Verreaux’s Eagle, with the latter probably breeding, based on the presence of a nest discovered in the course of the investigation. More details on the avifauna and bird habitats is provided in Section 6 of the Avifauna Impact Assessment Report (**Appendix 6B**).

6.10.1.4 Description of the Study Area

The Kudusberg substation, where the proposed overhead power line will start, is located on a plateau. From there, the proposed alignment drops sharply westwards down an escarpment and continues through undulating terrain until it reaches a second escarpment about 15-20km further west. Thereafter it drops again down the escarpment in a south-westerly direction, and then runs for about 20km on a flat plain until it reaches the Kappa Substation.

The land use is mostly extensive grazing of live-stock and game

The most important anthropogenic avifaunal-relevant habitat modifications currently present in the study area which could potentially influence the avifaunal community attract birds that were recorded in or close to the study area, are sources of surface water (earth dams and boreholes) and high voltage lines.

The habitat in the study area is discussed in more detail below. The priority species associated with each habitat class are listed in **Table 22**.

- **Succulent Karoo**

The whole of the study area is predominantly covered with natural vegetation. Vegetation structure, rather than the actual plant species, is more significant for bird species distribution and abundance (Harrison *et al.*, 1997). The study area is located mostly in the Succulent Karoo Biome, in the Rainshadow Valley Karoo Bioregion, with a small section around the Kudusberg Substation falling in the Fynbos Biome in the Karoo Renosterveld Bioregion (Mucina & Rutherford 2006). The dominant vegetation types in the study area are Tankwa Karoo and Koedoesberge – Moordenaars Karoo. Tankwa Karoo occurs on the plains in the western half of the study area. The plains are very sparsely vegetated with low succulent shrubland, and in extreme precipitation-poor years could appear almost barren (Mucina & Rutherford 2006). Koedoesberge – Moordenaars occurs in undulating area in the eastern half of the study area. It consists mainly of low succulent scrub and dotted by scattered tall shrubs and patches of ‘white’ grass, the most conspicuous dominants being dwarf shrubs (Mucina & Rutherford 2006). The dominant impression of the natural vegetation in the study area is that of medium to high density Karoo shrubland. Images of the typical vegetation structure in the study area is shown below in **Figure 32**.



Figure 32: An example of the dominant Succulent Karoo habitat in the study area, consisting mostly of dwarf shrubs with open ground in between

The priority species which could potentially utilise the Succulent Karoo habitat in the study area listed in **Table 22**, and below. Species with a high likelihood of regular occurrence in the study area are in **bold**:

- Black Harrier
- **Booted Eagle**
- Cape Crow
- Common Buzzard
- **Greater Kestrel**
- **Jackal Buzzard**
- **Karoo Korhaan**
- **Lanner Falcon**
- **Ludwig's Bustard**
- **Martial Eagle**
- **Namaqua Sandgrouse**
- **Pale Chanting Goshawk**
- **Pied Crow**
- **Rock Kestrel**
- Secretarybird
- Southern Black Korhaan
- **Spotted Eagle-owl**

▪ **Surface Water**

Surface water is of specific importance to avifauna in this semi-arid environment. There are many small earth dams in the study area, which are mostly located in drainage lines. The dams and larger drainage lines, e.g. the Groot River which transects the study area, hold water after good rains, when it could be attractive to various bird species, including large raptors, to drink and bath. It could also serve as an attraction to waterbirds when it contains water, although it must be noted that the study site is generally dry for most of the year. There are several drainage lines in the study area, which are mostly tributaries of the ephemeral Groot River. Some of the channels contain boulders and sheets of rock. Pools of standing water form in the larger drainage lines after good rains, especially where there are sheets of rock in the channel. Some of the drainage lines have steep sides, lined with exposed rock (see **Figure 33** to **Figure 35**).



Figure 33: An earth dam in the study area



Figure 34: A drainage line in the study area



Figure 35: A map of the rivers and waterbodies (dams and boreholes) in the study area relative to the proposed corridor options

The priority species which could potentially be attracted to the surface water in the study area listed in **Table 22**, and below. Species with a high likelihood of regular occurrence in the study area are in **bold**:

- Black Harrier
- **Booted Eagle**
- Cape Teal
- **Lanner Falcon**
- **Martial Eagle**
- **Pale Chanting Goshawk**
- Secretarybird
- Common Buzzard
- **Jackal Buzzard**
- **Verreaux's Eagle**
- African Black Duck
- African Sacred Ibis
- Black-headed Heron
- **Egyptian Goose**
- **Hadeda Ibis**
- Hamerkop
- **Namaqua Sandgrouse**
- Red-knobbed Coot
- **South African Shelduck**
- Yellow-billed Duck

▪ **High Voltage Lines**

Transmission lines are an important breeding substrate for raptors in the Karoo, due to the lack of large trees (Jenkins *et al.*, 2006, 2013). The Droërivier – Kappa 2 400kV transmission line runs through a large section of the study area. There is a nest originally built by Martial Eagles located on pylon 667 of this transmission line (see **Figure 36** and **Figure 37**). The pair of eagles have not bred there in the 2019

and 2020 breeding season. A pair of Lanner Falcons was recorded breeding on the nest in November 2019. Many other priority species, apart from Martial Eagles, also use the high voltage lines for roosting and/or breeding



Figure 36: Martial Eagle nest on tower 667 of the Droërvier – Kappa 2 400kV transmission line



Figure 37: A map of the high voltage lines in the study area. ME = Martial Eagle LF = Lanner Falcon JB = Jackal Buzzard

The priority species which could potentially be attracted to the high voltage lines in the study area listed in **Table 22**, and below. Species with a high likelihood of regular occurrence in the study area are in **bold**:

- **Booted Eagle**
- Common Buzzard
- **Lanner Falcon**
- **Martial Eagle**
- **Pale Chanting Goshawk**

- **Egyptian Goose**
 - **Hadeda Ibis**
 - **Verreaux's Eagle**
 - **Greater Kestrel**
 - **Pied Crow**
 - **Rock Kestrel**
 - **Spotted Eagle-owl**
 - **Jackal Buzzard**
- **Trees**

Many of the drainage lines in the study area are lined with tall shrubs, and stunted *Vachellia* trees, which can form fairly dense thickets in places. Although the trees are generally too small to be used for nesting by most of the priority species, some of the priority do use them on occasion for nesting and roosting.



Figure 38: An example of *Vachellia* shrub in a drainage line

The priority species which could potentially be attracted to the trees in the study area listed in **Table 22**, and below. Species with a high likelihood of regular occurrence in the study area are in **bold**:

- **Booted Eagle**
- **Lanner Falcon**
- **Martial Eagle**
- **Pale Chanting Goshawk**
- **Egyptian Goose**
- **Hadeda Ibis**
- **Greater Kestrel**
- **Rock Kestrel**
- **Spotted Eagle-owl**
- Secretarybird
- African Sacred Ibis
- Black-headed Heron
- Hamerkop
- Cape Crow
- **White-necked Raven**

- **Cliffs**

The eastern half of the study area contains very rugged terrain, and there are several cliffs which offer suitable habitat for cliff-nesting species. A Verreaux's Eagle nest was located on a cliff face approximately 2km from the closest corridor options (1, 2 and 5) and an active Jackal Buzzard nest was also located approximately 700m from the closest corridor options (1, 2 and 5) (see **Figure 39** to **Figure 40**).

The priority species which could potentially be attracted to the cliffs in the study area listed in **Table 22**, and below. Species with a high likelihood of regular occurrence in the study area are in **bold**:

- **Verreaux's Eagle**
- **White-necked Raven**
- **Lanner Falcon**
- **Booted Eagle**
- **Rock Kestrel**
- Hamerkop
- Black Stork
- **Jackal Buzzard**



Figure 39: Cliffs with a Verreaux's Eagle nest in the study area



Figure 40: The location of cliffs and nests in the study area

6.10.2 Avifauna sensitivity

- **Southern African Bird Atlas 2**

It is estimated that a total of 117 bird species could potentially occur in the broader area. Please refer to Appendix 1 of the Avifauna Impact Assessment Report (**Appendix 6B**) which provides a comprehensive list of all the species, including those recorded during the site investigation. Of these, 29 species are classified as priority species. The probability of a priority species occurring regularly in the study area is indicated in **Table 22**.

Table 22 below lists all the priority species and the possible impact on the respective species by the proposed development.

Key

- EN** = Endangered
- VU** = Vulnerable
- NT** = Near threatened
- H** = High
- M** = Medium
- L** = Low

Table 22: Priority species recorded in the broader area and potentially occurring in the study area

Common name	Taxonomic name	SABAP 2		Priority species	Status		Class				Possibility of regular occurrence	Recorded during surveys	Habitat class					Impact			
		Full protocol reporting rate	Ad hoc reporting rate		Red Data status: International	Red Data status: Regional	Raptor	Waterbird	Terrestrial	Corvid			Succulent Karoo	Surface water	Trees	HV pylons	Cliffs	Displacement: Disturbance and habitat transformation	Electrocution	Collisions	
African Black Duck	<i>Anas sparsa</i>	1.72	0.00	x				x			L			x							x
African Sacred Ibis	<i>Threskiornis aethiopicus</i>	1.72	0.00	x				x			L			x	x						x
Black Harrier	<i>Circus maurus</i>	8.62	7.37	x	EN	EN	x				M		x	x						x	x
Black-headed Heron	<i>Ardea melanocephala</i>	0.00	1.05	x				x			M			x	x						x
Black Stork	<i>Ciconia nigra</i>	0.00	0.00	x	LC	VU		x			M			x			x	x			x
Booted Eagle	<i>Aquila pennatus</i>	10.34	7.37	x			x				M		x	x	x	x	x			x	x
Cape Crow	<i>Corvus capensis</i>	0.00	1.05	x						x	L		x		x		x			x	
Cape Teal	<i>Anas capensis</i>	1.72	0.00	x			x				L			x							x
Common Buzzard	<i>Buteo buteo</i>	0.00	1.05	x			x				L		x	x		x				x	
Egyptian Goose	<i>Alopochen aegyptiacus</i>	24.14	5.26	x				x			H			x	x	x					x
Greater Kestrel	<i>Falco rupicoloides</i>	1.72	5.26	x			x				H		x		x	x		x		x	
Hadeda Ibis	<i>Bostrychia hagedash</i>	15.52	7.37	x				x			H			x	x	x				x	x
Hamerkop	<i>Scopus umbretta</i>	5.17	0.00	x				x			M			x	x		x				x
Jackal Buzzard	<i>Buteo rufufuscus</i>	10.34	8.42	x			x				H	x	x	x		x		x		x	x
Karoo Korhaan	<i>Eupodotis vigorsii</i>	15.52	1.05	x	NT	LC			x		H		x					x			x
Lanner Falcon	<i>Falco biarmicus</i>	6.90	1.05	x	VU	LC	x				H		x	x	x	x	x	x	x	x	
Ludwig's Bustard	<i>Neotis ludwigii</i>	15.52	6.32	x	EN	EN			x		M		x					x			x
Martial Eagle	<i>Polemaetus bellicosus</i>	5.17	2.11	x	VU	EN	x				H		x	x	x	x		x		x	x
Namaqua Sandgrouse	<i>Pterocles namaqua</i>	10.34	5.26	x					x		M	x	x	x							x

Common name	Taxonomic name	SABAP 2		Priority species	Status		Class				Possibility of regular occurrence	Recorded during surveys	Habitat class					Impact		
		Full protocol reporting rate	Ad hoc reporting rate		Red Data status: International	Red Data status: Regional	Raptor	Waterbird	Terrestrial	Corvid			Succulent Karoo	Surface water	Trees	HV pylons	Cliffs	Displacement: Disturbance and habitat transformation	Electrocution	Collisions
Pale Chanting Goshawk	<i>Melierax canorus</i>	67.24	36.84	x			x				H	x	x	x	x	x			x	
Pied Avocet	<i>Recurvirostra avosetta</i>	1.72	0.00	x				x			L									x
Pied Crow	<i>Corvus albus</i>	39.66	20.00	x					x		H	x	x			x		x	x	
Red-knobbed Coot	<i>Fulica cristata</i>	1.72	1.05	x				x			L			x						x
Rock Kestrel	<i>Falco rupicolus</i>	29.31	10.53	x			x				H	x	x		x	x	x		x	
Secretarybird	<i>Sagittarius serpentarius</i>	6.90	0.00	x	VU	VU	x		x		M		x	x	x			x		x
South African Shelduck	<i>Tadorna cana</i>	31.03	4.21	x				x			H			x						x
Southern Black Korhaan	<i>Afrotis afra</i>	0.00	1.05	x	VU	VU			x		L		x							x
Spotted Eagle-owl	<i>Bubo africanus</i>	10.34	1.05	x			x				H		x		x	x			x	
Verreaux's Eagle	<i>Aquila verreauxii</i>	10.34	7.37	x	VU	LC	x				H			x		x	x	x	x	x
White-necked Raven	<i>Corvus albicollis</i>	29.31	8.42	x					x		H	x			x		x	x	x	
Yellow-billed Duck	<i>Anas undulata</i>	1.72	1.05	x				x			L			x						x

6.10.3 Identification of Environmental Sensitivities

The following environmental sensitivities were identified from an avifaunal perspective for the proposed power line grid connections:

- **High sensitivity (Mitigation required): Surface water**

Included are areas within 300m of water troughs and earth dams, and all major drainage lines. Surface water in this semi-arid habitat is crucially important for priority avifauna, including several Red Data species such as Martial Eagle, Lanner Falcon, Verreaux's Eagle and Black Stork and many non-priority species. Drainage lines when flowing also attract waterbirds on occasion, as do the large pools that remain in the channel after the flow has stopped. Power lines that are routed near these sources of surface water pose a collision risk to birds using the water for drinking and bathing, and drainage lines, when flowing, are natural flight paths for birds. These areas will require mitigation with Bird Flight Diverters (BFDs).

- **High sensitivity (Mitigation required): Cliffs**

The proposed OHL runs down two escarpment areas, where it will pose a risk to cliff nesting species such as Verreaux's Eagle, Booted Eagle, Lanner Falcon, Jackal Buzzard and Black Stork. These species all use the declivity wind currents along the cliff faces and slopes for lift and they will be at risk of collisions with the OHL where it traverses these cliffs and slopes. These areas will require mitigation with BFDs.

- **Medium sensitivity (Mitigation preferred): Succulent Karoo**

The entire study area is rated as medium sensitivity due to the regular presence of collision-prone species such as Ludwig's Bustard, Karoo Korhaan and Southern Black Korhaan. It would therefore be advisable to mitigate the whole OHL with BFDs if possible.

See **Figure 41** below for a map of high sensitivity areas.

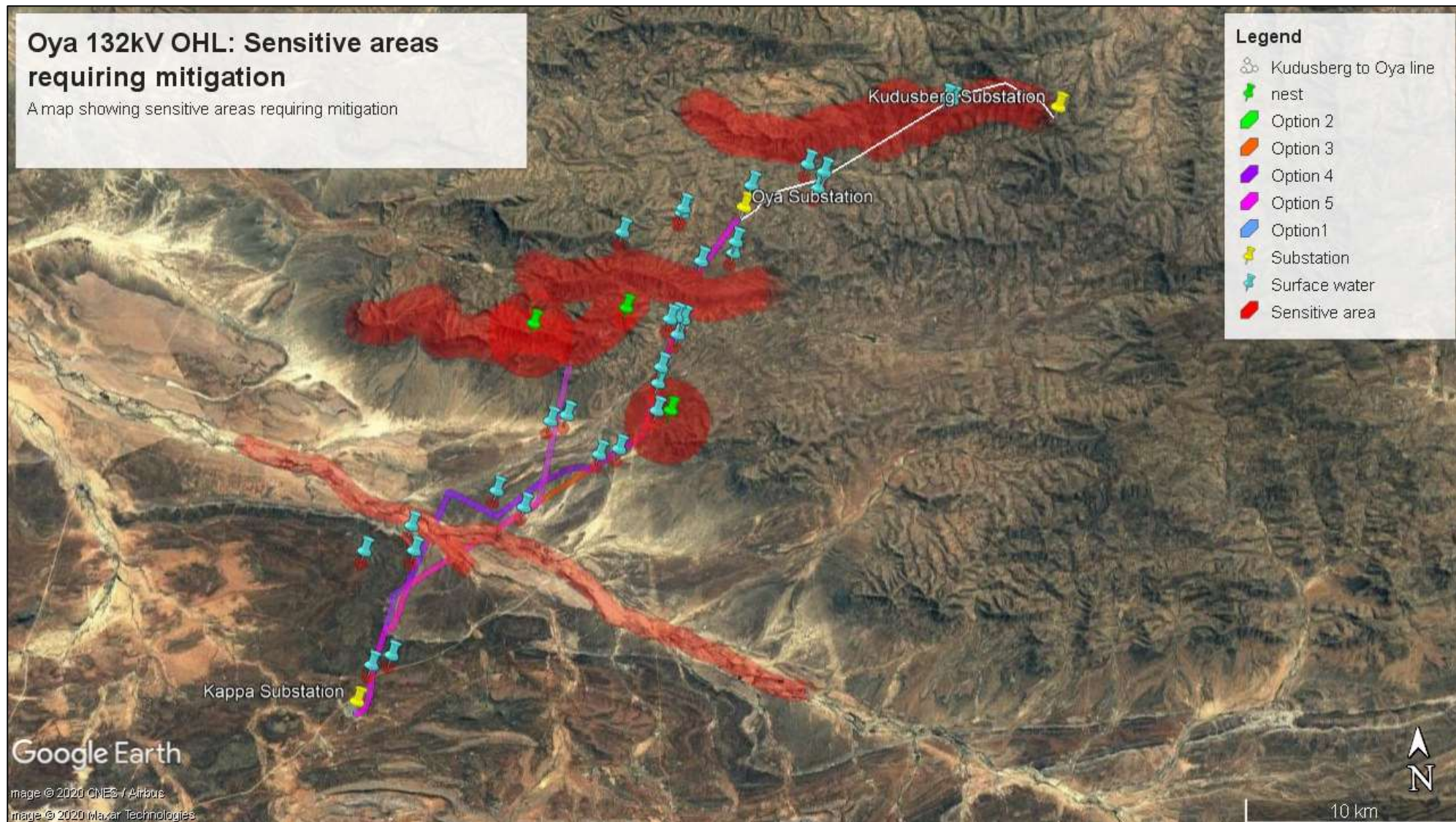


Figure 41: High sensitivity areas in the study area: cliffs, dams and boreholes, and the Groot River

6.11 Heritage (including Archaeology, Palaeontology and Cultural Landscapes)

The Heritage Impact Assessment (HIA) (including Archaeology, Palaeontology and Cultural Landscapes) was conducted by Jenna Lavin of CTS Heritage. The full HIA Report is included in **Appendix 6C** respectively.

6.11.1 Description of Property and Affected Environment

The area proposed for development is located within an undulating landscape within which the predominant land use is game grazing. It is a semi-arid region and the vegetation is characteristic of the Succulent Karoo Biome. The area is covered in varying densities of knee high scrub. There is a farm house and numerous jeep tracks across the large farm property but the site remains predominantly natural and very isolated. Natural ephemeral streams (currently dry) and man-made sources of water were observed.

According to a Cultural Landscape Assessment completed for a neighbouring project (Jansen 2020), *“The Karoo Cultural Landscape consists of the following elements:*

1. *This part of the Karoo is prized for its wide-open spaces and expansive vistas.*
2. *Considering the larger context, the character of the land is mostly homogenous. The proposed site is located within the expansive plains typical of the karoo, and end in a ridgeline that demarcates the Eastern boundary of these three sites. Tooverkop, and Pramberg, and a component, is a distinct feature in the landscape, that as a result determines the sense of place of the various sites.*
3. *Small shrubs dominate the plain, accentuating the mountains and valleys moving through the landscape. Taller shrubs are found within the drainage lines, and among rocky outcrops, and in close proximity to the farm werf.*
4. *Absence of trees is noteworthy, and therefore any tree (single or in a cluster) is considered a feature that is associated with cultural activity.*
5. *Tombstone weathering of the rocks are distinctive on the kopjes, and linear shale outcroppings in a vertical position were noted. The outcroppings generally create an environment where different plant species are found.*
6. *Some of these tombstone weathered rocks are like fingers, and get used in the construction of fence lines as posts, for hakkiesdraad / barbed wire, and intermittent droppers or these rocks. Most farms have a farm gate or ‘pyphek’ that allows entrance to the various fields/farm roads.*
7. *The main form of agriculture is sheep farming. Karoo sheep are known for their distinct taste that they get from the feeding on the small shrubs. Large tracts of land are needed to support one sheep. The portions of farms in the karoo are as a result typically larger.*
8. *Many of the farm werfs include historic structures. Usually a modest size farm dwelling made from local rocks, painted white with an outbuilding. Some of these structures are no longer in use, are converted into farm sheds to house animals, or any other use that supports farming activities. One of the farms had a farm dwelling with a large porch, and remnants of an historic adobe structure.*
9. *Kraal structures from local rock are found in the area, and often against the slope of the kopje, an interesting feature in the landscape. These were most likely used to keep sheep overnight, or used as a lambing kraal.*
10. *Typical of the karoo is a round concrete dam, with a wind pump. The study area also features a number of larger dams constructed through digging depressions in the landscape in drainage lines.*
11. *Remnant outspan areas are found in the area. These relate to the trekboere, and could possibly relate to existing economic activity.*

12. Dirt roads, and three transmission lines are found in close proximity of the site, as well as an established WEF.
13. Vehicles are seen approaching from far in the form of a moving dust column (mostly white bakkies associated with the developed wind farm in the area)."

In her description of the cultural landscape context, Bailey (2020) describes the Baakens River Cultural Landscape as “sparsely populated with a few farmsteads and their associated structures located on the valley floors, adjacent to watercourses and linked by a series of crisscrossing farm tracks and significant historic roads that are material remains of the important connections and linkages between the people travelling across the vast landscape and living isolated lives. Sites of habitation are usually layered in their historic signature, with various periods of habitation evident on the same site over time, such as stone age sites (rock art and stone age scatter) farmsteads, stone kraals with their herder’s cottages and more recent 20th century associated farm structures (sheds and seasonal labourers residence) and tourist cottages. The farm buildings in the area contain elements greater than 60 years of age and fall with the general protection of the National Heritage Resources Act (25 of 1999) (NHRA). Significant landscape elements were identified within the study site, including tangible heritage resources, specific cultural landscape areas and intangible heritage resources and graded according to NHRA grading. **The significance grading of the landscape elements ranged from IIIB to II.”**



Figure 42: The proposed alignment alternatives for the Oya OHL grid connection and proposed substation sites

6.11.2 Geological and Palaeontological Context of the Study Area

According to the extract from the Council for GeoScience Map 3220 for Sutherland (**Figure 11**) and Map 3320 for Ladismith (**Figure 12**), the area proposed for development is underlain by sediments of the Karoo Supergroup assigned to the Dwyka, Ecca and Witteberg Groups in addition to Quaternary Sands. The Dwyka Group is known to preserve trace fossils, organic-walled microfossils, rare marine invertebrates (e.g. molluscs), fish, vascular plants, predominantly interglacial and post-glacial trace fossil assemblages, possibility of body fossils (e.g. molluscs, fish, plants). The Ecca Group is known to

conserve non-marine trace fossils, vascular plants (including petrified wood) and palynomorphs of *Glossopteris* flora, mesosaurid reptiles, fish (including microvertebrate remains, coprolites), crustaceans, sparse marine shelly invertebrates (molluscs, brachiopods), microfossils (radiolarians *etc.*) and insects. The Witteberg Group is very palaeontologically sensitive and is known to conserve trace fossils, vascular plants, sparse shelly invertebrates and fish (brachiopods, bivalves *etc.*). In the palaeontological assessment completed for the Oya Energy Facility, Almond (2020) concluded that the Oya project area has low paleontological sensitivity overall, but with small unpredictable areas of high to very high sensitivity. It is therefore likely that the proposed development will impact on significant palaeontological heritage and as such, an assessment of impacts to palaeontological resources is recommended for the portions of the proposed OHL alternatives that have not been previously assessed. **Table 23** shows a summary of the geology and palaeontology directly underlying the OHL development.

Table 23: Summary of the Groups and Formations, with lithology, age and known fossil occurrences, underlying the OHL and substation development

Symbol	Group	Formation	Lithology	Approximate Age	Palaeontology
Pa	Beaufort, Adelaide Subgroup	Abrahamskraal	Green to blue-grey mudstones	266 – 250 Ma	Bioturbation, Trance fossils ~Tapinocephalus Assemblage Zone
Pko	Ecca	Waterford Fm. (Old Koedoesberg Fm.)	Shales, siltstones, sandstones.	290 – 266 Ma	Wave ripples, silicified wood, Trace fossils.
Ps		Skoorsteensberg	Sandstone interbedded with shale		Trace fossils, Glossopteris
Pt		Tierberg	Dark shales, yellow tuffs.		Invertebrate fossils, sponge spicules, trace fossils, fish scales
Pp		Prince Albert	Shales, wackes, arenite.		Marine invertebrates, fish (<i>Dwykasselachus oosthuizeni</i>), coprolites.
C-Pd	Dwyka		Diamictites	290 – 317 Ma	Wood, trace fossils, invertebrates, pollen.

The following section will provide a summary of the geology and palaeontology of the formations that underlie the proposed development.

Beaufort Group

Abrahamskraal Formation

The rocks of the Abrahamskraal Formation are generally green-grey to blue-grey mudstones, although grey-red, red-brown, or purple mudstones are also found. Calcareous nodules are present, these nodules tend to weather out brown. Within these mudstone layers fine grained green-grey sandstones are found, usually showing an upward fining trend. These sandstones can range from metres to tens of metres in thickness in some areas. These sandstone layers are important stratigraphic markers for geologists and palaeontologist. (Manson, (2007). These mudstones are also interbedded with siltstone beds. These sedimentary rocks tend to reveal a depositional environment in a retro-arc foreland basin (Karoo Basin), where sediment was deposited in a low energy alluvial plain flowing to the north. As indicated by fluvial and lacustrine sediments. (Johnson *et al.*, 2006)

The lower part of the Formation is seen as deltaic (green-grey, blue-grey mudstones) while the upper part of the Formation is seen as fully terrestrial (often indicated by the red mudstones).

The Abrahamskraal Formation correlates well with the Tapinocephalus Assemblage Zone. Therapsids, pareiasaur reptiles and fish fossils have been sparsely reported in this Formation. Plant material (e.g. sphenophyte ferns, fossil wood), freshwater invertebrates (principally smooth-shelled bivalves; and a range of trace fossils including tetrapod trackways (e.g. temnospondyl amphibians, therapsids) have been found.

Ecce Group

Waterford Formation (previously Carnarvon Fm / Koedoesberg Fm)

The thickness of the Waterford Formation fluctuates between 200m and 800m. The Formation consists of fine-grained sandstones and mudrock or clastic rhythmite units. The individual sandstone units have an average thickness of 6m, with 18m being the maximum. These units are mostly structureless, but horizontal lamination, low angle crossbedding and ripple lamination is found in some areas. Oscillation ripples are more common. The Formation is characterised by ball and pillow structures, as well as other water escape features. Thin mud-flake conglomerates area occasionally found. Brown weathering calcareous concretions can be found in the sandstone and mudstone. Wave ripples indicate a shallow sedimentary environment, in a delta front area / storm dominated shelf. (Johnson *et al.*, 2006)

The Formation is mostly known for petrified wood and other plant material of the Glossopteris Flora (e.g. Glossopteris, Phyllothea). Large fossil logs ("Dadoxylon") showing seasonal growth rings are found. Two different genera of gymnospermous woods, Prototaxoxylon and Australoxylon, have been identified (Bamford 1999, 2004). Rolled vertebrate bone fragments, low intensity bioturbation, and trace fossils also found.

Skoorsteen Formation

The Skoorsteen Formation is a lens shaped arenaceous unit. It consists of five sandstone rich units of about 60m in thickness, this brings the total thickness of the Skoorsteen Formation to about 250m. These sandstone units are separated by shale units. A single sandstone is usually about 6m thick, with well-defined upper and lower boundaries. These sandstones are mostly massive, but have been found to contain convolute bedding, rip-up clasts, load clast, dewatering structures, climbing ripple lamination, and sole marks of both physical and biogenic origin. Typical Bouma turbidite sequences area common indicating an unstable delta front slope as a depositional environment of about 500m under water. Trace fossils are found in the form of horizontal feeding traces. Plant fragments of Glossopteris like flora is common. (Johnson *et al.*, 2006)

Tierberg Formation

The Tierberg Formation ranges in thickness form 700m in the west to 350m in the north east. It is a predominantly argillaceous Formation which grades upwards into the Waterford Formation. These grey mudrock and fine sandstones where deposited of shore in an inland sea, with influences of offshore fans, and distal pro-deltaic deposition. There is some occurrence of yellow tuffaceous layers of up to 10cm thick in the lower part of the succession.

The Tierberg Formation is known for a wide range of both vertebrate and invertebrate trace fossils, these include, fish swimming trails (Undichna), crustacean trackways (Umfolozia), arthropod feeding marks (Vadoscavichna) and resting traces (Quadriscopinchna / Broomichnium). Boddy fossils are mostly found in the form of plant remains of glossopteris including fossilised wood. Some micro vertebrate remains have been reported. Prinsloo (1989).

Prince Albert Formation

This formation is confined to the south western half of the karoo basin. The thickness of the formation is very variable and range from 10 to 300m. The Formation is divided into a northern and southern facies. The northern facies contain grey to olive green micaceous shales, grey silty shales, and

carbonaceous shales, arenites and wackes. It shows a pronounced transition into the underlying glacial deposits. It also contains ice rafted debris, and fossils of cephalopods, lamellibranches, brachiopods, fish remains, coprolites and plant matter.

The southern facies consist of dark grey, pyrite bearing splintery shales, dark coloured cherts, carbonate concretions and phosphatic nodule lenses. Fossils remains of shark, sponge spicules, foraminifera, radiolaria and acritarchs have be found. (Johnson *et al.*, 2006).

Dwyka Group

Dwyka rest on glaciated Precambrian bedrock. The main sedimentary environment is thought to be in a marine basin. The Group Is known for a massive diamictite facies, these facies contain highly compressed, mostly clast rich diamictite. It attains its greatest thickness in the south where it reaches 800m. The Dwyka Group is known for low diversity plant fossils due the cold glacial environment during deposition. Coprolites fish trace fossils, crustaceans and arthropods have been found in this Group. (Johnson *et al.*, 2006).

6.11.3 History and Evolution of the Site and Context

▪ **Desktop Assessment**

Cultural Landscape

The proposed power line is located in the Witzenberg and Karoo Hoogland Local Municipalities respectively, which fall within the Cape Winelands and Namakwa District Municipalities. The area proposed for development is located within a REDZ area and is firmly located within the Tanqua and Ceres Karoo. This part of the Karoo is prized for its wide-open spaces and expansive vistas. Hart et al. (2016) note that the cultural landscape of this area is agricultural in nature, and consists of mostly stock farming with very occasional agriculture. The area is isolated with natural qualities and semi-desert landscapes. Many of the farm werfs in the broader area include historic structures. These are usually a modest size farm dwelling made from local rocks, and painted white with an outbuilding. Some of these structures are no longer in use, or are converted into farm sheds, housing animals, or any other use that supports farming activities. Other infrastructure typically found in the karoo is a round concrete dam, with a wind pump. The broader cultural landscape associated with the Baakens River Cultural Landscape has been previously thoroughly assessed by Bailey (2020) for the Oya HIA and the larger basin has been assessed by Jansen (2020a and 2020b).

The interaction between the topography, geology, flora and historical remnants of human occupation of the area form a unique cultural landscape that may be negatively impacted by the proposed development. However, it must be noted that there are a number of approved Renewable Energy Facilities in the area, furthermore, the proposed OHL alignment falls within a Strategic Transmission Corridor (namely the Central Corridor) which already contains existing power line infrastructure (Figure 6). As noted in the Cultural Landscape Assessment for Oya (Bailey 2020), the negative impact of the development of such infrastructure on the Cultural Landscape is unavoidably high and are inevitable. The only mitigation option available is to develop this infrastructure in clusters, such as within the Komsberg REDZ and Central Corridor (as with this project). As the cultural landscape for this area has already been assessed by Bailey (2020) as well as Jansen (2020), it is recommended that no additional Cultural Landscape assessment is necessary for this project.

According to a Cultural Landscape Assessment completed in the area by Jansen et al. 2020a, “Access to the site is gained from the main gravel road that connects the R356 to Matjiesfontein, where the study area is located in a bowl-like catchment area created by the Koedoesberg Mountains to the north and the Bontebergen Mountains to the south. The R356 is known as the forgotten highway to the North that runs up past Sutherland, with access through Karooport. This alignment is significant to understand

the greater context of the study area, since Karooport formed part of a system of outspans that functioned as an area of rest in the journey towards the north. The route and poort were also used as a thoroughfare of herds of bovids, as a means to travel between two biomes in order to benefit from different pastures, and hunting grounds to the north.”

Many of the farm werfs in the broader area include historic structures. These are usually a modest size farm dwelling made from local rocks, and painted white with an outbuilding. Some of these structures are no longer in use, or are converted into farm sheds, housing animals, or any other use that supports farming activities. One of the farms (Bruwelsfontein) had a farm dwelling with a large porch, and remnants of an old adobe structure. Other infrastructure typically found in the karoo is a round concrete dam, with a wind pump.

The Cultural Landscape Assessment by Jansen et al. (2020a) further notes that outspan areas form a significant feature in the Karoo as they are not only important to understand in terms of heritage, but also in terms of existing active use within the current cultural landscape, in the form of living heritage or the potential for an active use to be enhanced. There are two known outspan areas in close proximity to the proposed power line alignments (**Figure 43**). The system of outspan areas are possibly still actively used by the sheep-shearers of the Great Karoo that are known and acknowledged of the karretjiemense (Donkey Cart People). The following is an extract of a Masters study that was done by Steyn (2009) on the karretjiemense:

“Karretjie People are usually seen migrating on secondary and tertiary roads in pursuit of a shearing assignment on farms or camping at an outspan next to a road.

They are described as “preferentially endogamous, non-food producing communities who subsist predominantly on the sale of goods and services to sedentary customers and employ spatial mobility in varying degrees as a survival strategy” (Rao 1987:1). DNA of the Karretjie People can be traced directly to the KhoeKhoen and San (cf. De Jongh & Soodyall, Forthcoming). from the gathering-hunting /Xam-speaking San (Bushmen) and/or the nomadic-pastoral KhoeKhoen (mainly Griqua and Korana), that is, of the earliest inhabitants of the Karoo.

However, due to various factors the lifestyle of both the /Xam and the Griqua/Korana were transformed. In the case of the /Xam, for example, they changed from nomadic hunters to become so-called ‘tame Bushmen’ farm labourers.

They retained their mobility, first on foot, later with the help of pack animals and eventually they adopted the donkey cart as mode of transport, constructing their carts from materials salvaged from discarded parts of horse carriages and motorcars. With the mobility made possible by the donkey cart, the Karretjie People, as they became known, developed a flexible and mobile lifestyle in order to exploit employment opportunities on farms. Their means of livelihood necessitates spatial mobility and therefore the donkey cart allows them to utilise discontinuous opportunities, primarily for shearing.”

Where areas are identified to have an active use, cultural significance is heightened, and should be protected as such. The proposed development of the OHL and substations might negatively impact on this living heritage if not managed and mitigated appropriately.



Figure 43: The proposed alignment alternatives for the Oya OHL grid connection and substation sites relative to known outspans in the area

Previous Heritage Assessments

Heritage Impact Assessments have been completed within 20km of the area proposed for development and are recorded on SAHRIS, the South African Heritage Resources Information System, or have been sourced for this desktop screening assessment. It is noted that wherever an assessment has been completed, heritage resources of significance have been identified. According to Deacon (2008, SAHRIS ID 4843), this area “is well known for its rock art. However, this is restricted to the kloofs and higher lying areas. There is the possibility that stone artefacts of different ages may occur in well-watered lowlands and valley margins.” In addition, according to Pinto and Smuts (2011, SAHRIS ID 375379), “Agriculture since colonial times has been, to a large extent, marginal and has had a low impact on the archaeological evidence for these early communities. Prehistoric sites in the area, consisting predominantly of surface and sub-surface stone artefact scatters in the open landscape together with overhangs and recesses in the sandstone hills used as shelters, are likely to be well preserved with little disturbance from later historic periods.” According to Smuts et al. (2018, SAHRIS NID 514990), “studies completed in the broader area identified surprisingly little pre-colonial or stone age archaeology, and distinct spatial patterning to the little that was found. Almost all archaeological material, predominantly in the form of scatters, has been identified on the flat floodplains up to the foothills of the mountains, and within river valleys along watercourses... The area is known to have been inhabited since the Early Stone Age (ESA) and throughout the Middle Stone Age (MSA). Later Stone Age (LSA) scatters have also been documented throughout the region, although at remarkably low density, although excavations at cave sites near Sutherland yielded significant LSA cultural material” Furthermore, Smuts et al (2018) notes that rock art and archaeological resources associated with the trek boers and historical occupation of the area are known from the region. In addition, it has been noted that there is often a more dense accumulation of archaeological artefactual material along an exposure of the Collingwood Formation (Pc) as this formation provides an excellent raw material source. Part of the proposed OHL lies along this formation.

In 2016 a Draft HIA (Hart *et al.*,) for the proposed Kolkies and Karee WEFs on neighbouring properties was not completed as the project was cancelled. Hart et al. (2016) note that in terms of impacts to archaeology, sites tend to be found on the banks of river beds. Discrete scatters of Middle Stone Age artefacts are often identified in sheet washed locations at several farms in the area but they are not

considered to be of high significance. In general, Hart et al. (2016) found that Late and Early Stone Age Archaeology is sparse. Hart et al. (2016) also found that the built environment is sparse. Hart et al. (2016) note that previous heritage work has shown there are numerous stone cairns along the dry river beds which may represent graves. Similarly, in the archaeological assessment completed for the Oya Energy facility by Fourie (2020), burial grounds and graves, some old farmsteads and kraals. Lavin and Wiltshire (2020) identified diffuse scatters of Middle and Later Stone Age artefacts in the neighbouring Pienaarspoort REF area.

As such, it is likely that the proposed development will impact on significant archaeological and other heritage resources and as such, an assessment that identifies this impact is recommended. However, much of the OHL alternative alignments have been covered by existing completed heritage assessments (**Figure 44**). It is therefore recommended that only the portions of the alternatives that have not yet been assessed are surveyed for impacts to archaeological heritage.

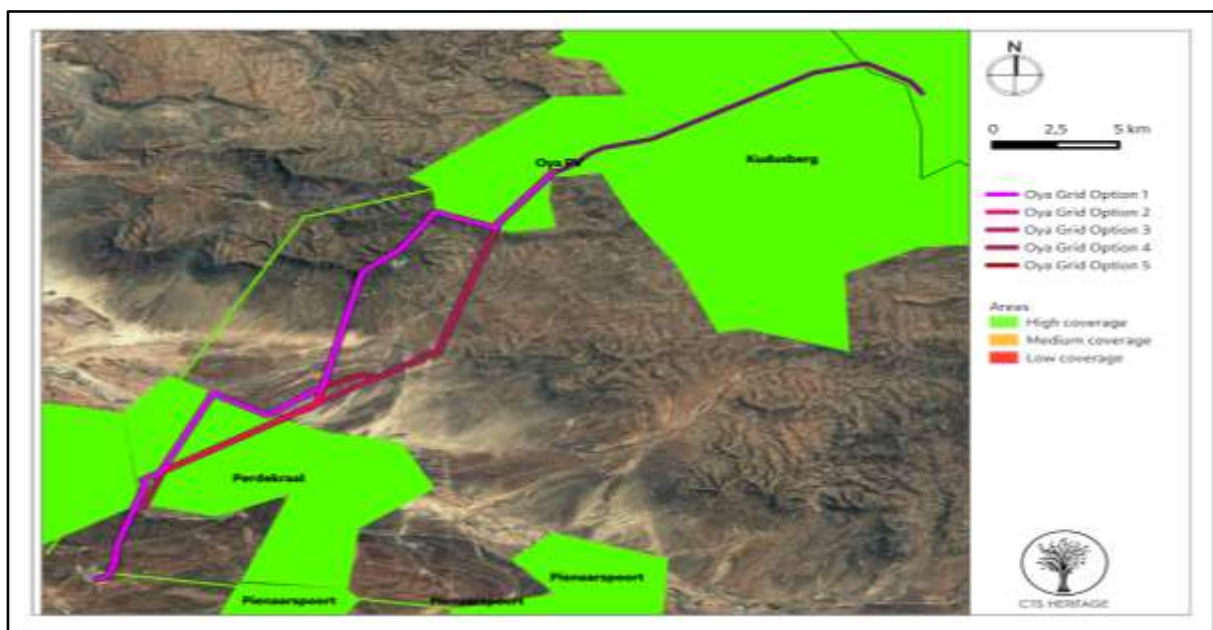


Figure 44: Spatialisation of heritage assessments conducted in proximity to the proposed development

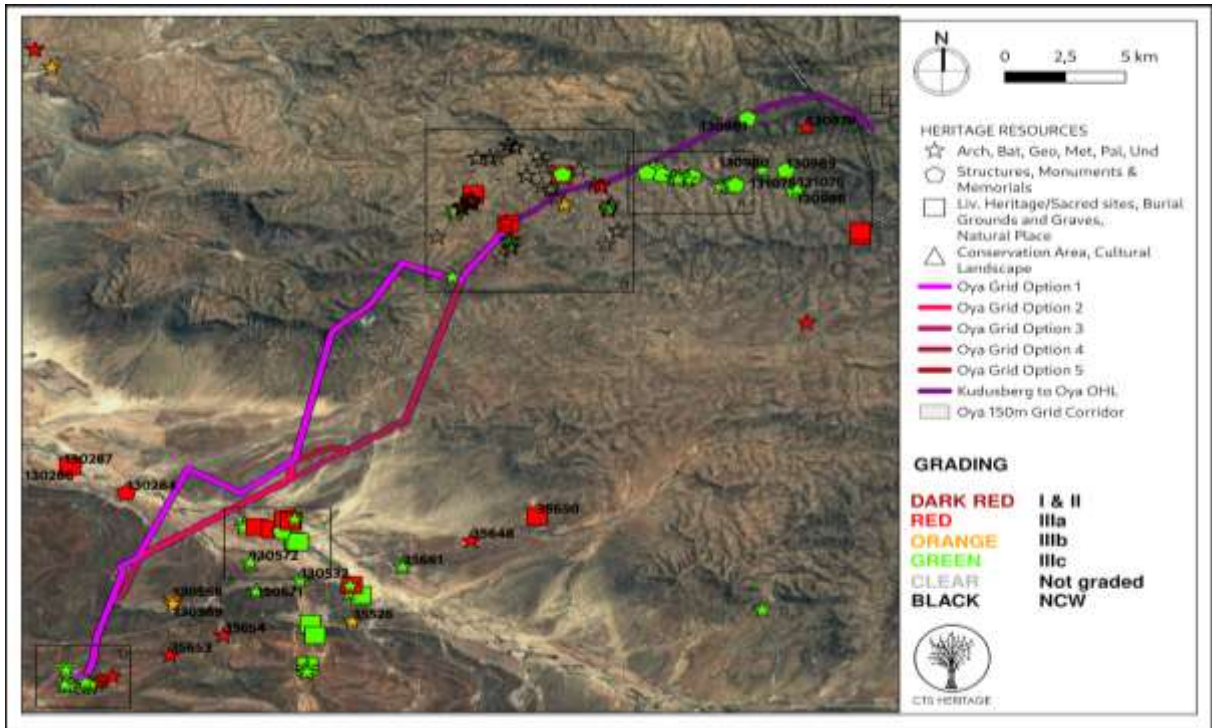


Figure 45: Spatialisation of heritage resources known in proximity to the proposed development (see Appendices of HIA Report for insets)



Figure 46: Spatialisation of heritage resources known in proximity to the proposed development (see Appendices of HIA Report for insets)

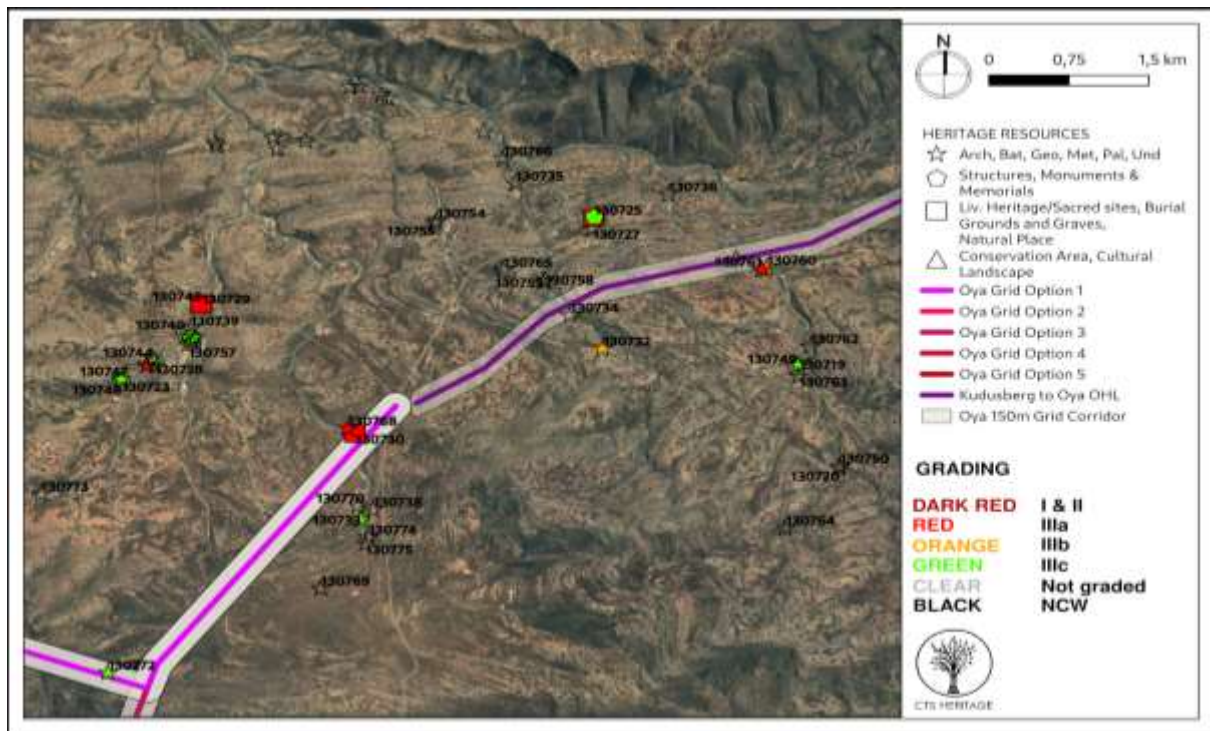


Figure 47: Spatialisation of heritage resources known in proximity to the proposed development (see Appendices of HIA Report for insets)

Palaeontology

According to the SAHRIS Palaeosensitivity Map, the area proposed for development is underlain by sediments that are of low, moderate, high and very high palaeontological sensitivity. According to the extract from the Council for GeoScience Map 3220 for Sutherland and Map 3320 for Ladismith, the area proposed for development is underlain by sediments of the Karoo Supergroup assigned to the Dwyka, Ecca and Witteberg Groups in addition to Quaternary Sands. The Dwyka Group is known to preserve trace fossils, organic-walled microfossils, rare marine invertebrates (eg molluscs), fish, vascular plants, predominantly interglacial and post-glacial trace fossil assemblages, possibility of body fossils (eg molluscs, fish, plants). The Ecca Group is known to conserve non-marine trace fossils, vascular plants (including petrified wood) and palynomorphs of *Glossopteris* flora, mesosaurid reptiles, fish (including microvertebrate remains, coprolites), crustaceans, sparse marine shelly invertebrates (molluscs, brachiopods), microfossils (radiolarians etc.) and insects. The Witteberg Group is very palaeontologically sensitive and is known to conserve trace fossils, vascular plants, sparse shelly invertebrates and fish (brachiopods, bivalves etc.). In the palaeontological assessment completed for the Oya Energy Facility, Almond (2020) concluded that the Oya project area has low paleontological sensitivity overall, but with small unpredictable areas of high to very high sensitivity. It is therefore likely that the proposed development will impact on significant palaeontological heritage.

Known Resources

A number of known archaeological and palaeontological heritage resources fall within the 300m buffer area proposed for the Oya OHL and substations according to SAHRIS (**Figure 46** and **Figure 47**). These are SAHRIS Site ID 130730, 130734, 130768, 130772 and 130981, as well as a small cluster of sites with SAHRIS IDs 131154, 130760 and 130761 along the river course. Site 130730 is graded IIIA and is described by Fourie (2020) as “*Three grave features including a medium-density scatter of MSA and LSA stone tools... The site is located on the eastern bank of a river and has evidence of flooding. Three possible stone grave features were identified. The first grave (OYPV-10a) consists of packed stones in a semi-rectangular shape. The second grave (OYPV- 10b) has two sharp rectangular stones placed in one corner, most likely forming part of a grave marker that has been washed away or covered by sand from the river. The third grave feature (OYPV-10c) contains two stones placed on the eastern*

and western end, marking the feature as a grave. A medium-density scatter of MSA and LSA tools were found around the site. The stone tools mostly consist of cores, flakes, blades and chunks, and formal tools such as scrapers. The tools were made from chert, shale, and hornfels. Burial grounds and graves are protected under Section 36 of the NHRA 25 of 1999. Thus, the site is provisionally rated as having a high heritage significance with a heritage rating of IIIA. All graves have high levels of emotional, religious and in some cases historical significance. It is also important to understand that the identified graves could have significant heritage value to the relevant families.”

Site 130734 is not graded as significant and is described by Fourie (2020) as consisting of *“Several LSA stone tools were found scattered over an area of 107,23m² near the river on the farm Gats Rivier 156. The flakes were made from chert and shale.”* Site 130768 is also graded IIIA for its palaeontological research potential and is described by Almond (2020) as *“Good riverbed and bank exposures of tabular, greyish wackes with undulose or wave-rippled tops. Thin, fissile, medium-grained, laminated, greyish sandy interbeds, locally ferruginised, towards base of package of medium- to thick-bedded wackes (horizontally to current ripple cross-laminated) containing dense hash of transported plant debris – mainly stems, including probable sphenophytes - preserved as moulds where weathered and carbonaceous compressions in fresher material. Some possible axes up to 10 cm across”.* Site 130981 is a structure that is graded IIIC and is described as *“Circular cobble-built structure, piled stone, likely hut or shelter”.* The remaining sites are all archaeological occurrences that are considered to be not conservation-worthy (130734 and 131154).

Sites 130760, 130761, 130768 and 130772 are all palaeontological finds identified by Almond (2020). These paleontological finds all consist of fossilised wood or plant material from either the Waterford Formation or the Abrahamskraal Formation.

Site 130772 is an palaeontological occurrence of fossil wood graded IIIC and is described as *“Waterford Formation. Hillslope exposure of grey-green mudrocks with large ferruginous carbonate diagenetic concretions and package of tabular, thin-bedded wackes. Small float block of silicified wood. ”*

Site 130981 is a structure that is graded IIIC and is described as *“Circular cobble-built structure, piled stone, likely hut or shelter”.* The remaining sites are all archaeological observations that are considered to be not conservation-worthy (130734, 130768, 131154, 130760 and 130761).

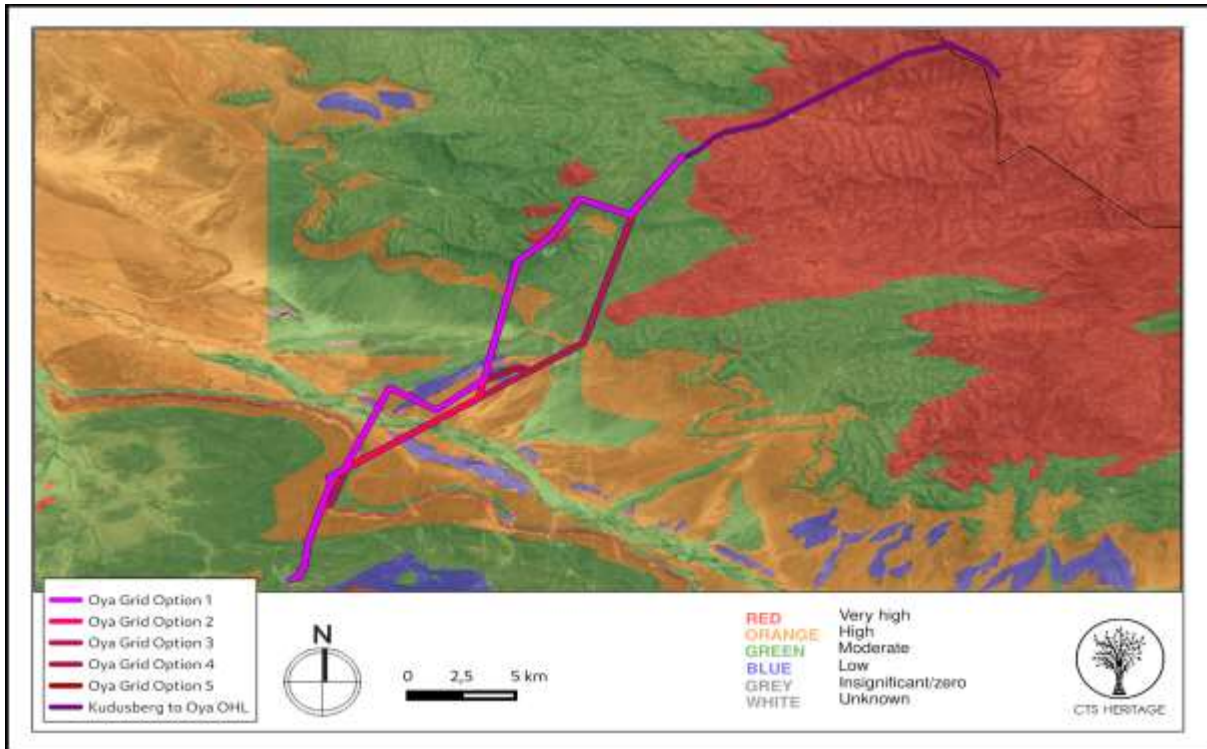


Figure 48: Palaeontological sensitivity of the proposed development area

6.11.4 Identification of Heritage Resources

- **Summary of Findings of Specialist Reports**

Cultural Landscape Summary

Bailey (2020) identified a number of Cultural Landscape Areas of significance in her assessment of the impacts of the Oya Energy Facility on the Cultural Landscape. These elements are included below and are used to assess the anticipated impacts of the proposed OHL and substations on the Cultural Landscape resources previously identified by Bailey (2020). The below information is taken directly from Bailey (2020).

Ridges (Grade II for scenic qualities)

This area is characterised by a series of very high and long ridges with valleys in-between. On a regional scale, viewed from the lower surrounding valleys floors and more distant plains, the high ridges are a dramatic sight and create the layers of blue and grey typical of the Karoo.

Watercourses and river confluences (Graded IIIB)

Water is a critical resource, ever more so in the Karoo due to its scarcity. The rivers run dry most of the year, historically leaving any inhabitants dependent on a few springs in the landscape. Herds of wildlife and stock and their hunters and watchers would travel between water sources as they became variably available throughout the season. Human development structures are found most densely clustered at the confluences of ridge and spring fed water courses and then more spread along these watercourses. Historically the pastoralist farmsteads would have been located as close as possible to the best sources of clean, consistent water supply which would have been the springs and seeps along the tops of the watersheds. Later, with the introduction of wind pumps in the late 18th century, farmers could move further down the valleys (Regensberg, 2016). Further, as the ground adjacent to watercourses is usually more pliable and better for irrigation, these areas were more likely to be used for any activity that required digging, such as cultivation or burials.

The watercourses that have been specifically identified as significant as cultural landscape elements in the broader area are:

- The non-perennial courses on the Baakens River farm, which converge at the Baakens Rivier homestead / tourist cottages and then follow a single course northward to join with the Ongeluksrivier which crosses the study site at the northern most point of the PV facility.
- There is a non-perennial watercourse on the Gats Rivier farm portion which runs north towards and joins up with the Ongeluksrivier.
- The Ongeluksrivier which runs along the northern boundary of the Oya Energy Facility site, is one (1) of the main rivers in the area, one (1) of the few with a name.

Water course and road intersections (Graded IIIC)

These points of intersection are significant as places that influence and determine the patterns and processes of the cultural landscape. Road intersections with the above identified watercourses are considered significant as cultural landscape elements.

Baakens Rivier Valley CLA (Graded IIIA for historic road and CLA)

The Baakens River homestead is part of the Baakens Rivier valley CLA which is characterised by long phases of occupation from at least the Late Stone Age, evident from the archaeological sites located further up river, through the pre-colonial and colonial, evident in the large stone kraals and associated stone herder's huts, up to the modern century with wire fencing and corrugated iron construction for stock management. The evolution of the Baakens Rivier CLA, where habitation follows a river course and over time moves further downstream as land use changes from hunting of wild game to herding and stock keeping, reflects the landscape patterns of the nearby Uriasgat and Matjiesfontein CLA's identified in the Kudusberg WEF Cultural Landscape Assessment report (Rabe Bailey, 2018). The solar powered water points for the management of wildlife, are the most recent element of cultural landscape in the Baakens Rivier CLA, illustrating the evolution of human society and settlement over time, under the influence of the physical constraints and/or opportunities presented by their natural environment and of successive social, economic and cultural forces, both external and internal.

Gats Rivier Valley CLA (Graded IIIA for historic road and CLA)

The road that runs through the Gats Rivier Valley CLA is evident on historic maps and considered as a Grand Trunk Road on the Laingsberg Imperial map of 1900 – 1919. The farm road runs next to the Gats Rivier entering the narrow valley from the west (off the R356) running west to east and exiting the valley to the north at the Oliviersberg farmstead. The valley floor along the Gats Rivier has archaeological evidence of continual land use over the last few centuries. Historic farmsteads (Gats Rivier and Oliviersberg), stone kraals (GTR001), packed stone residential structures (GTR002) and evidence of water harvesting are all evident, as are remnant remains of cultivation. More recent elements of corrugated iron have also been introduced. According to the local farm manager there are historic stone buildings that are thought to be old school buildings (across from Springbok Cottage) which is also the site of the old Gats Rivier farmstead. No clear pre-colonial material was identified but it cannot be ruled out due to the prevalence of such sites in the vicinity such as the relatively nearby rock shelter north of Oliviersberg farmstead that contained pre-colonial material. Considering the increased traffic that would have travelled along this valley in the past, relative to other surrounding roads, there is an increased potential for significant archaeological remains that form part of the story of the relationship between people and the land in this place. Travelling south up a watercourse intersection off the historic road towards "Fontein" there are remnants of another historic farmstead with stone kraal and walling along the watercourse.

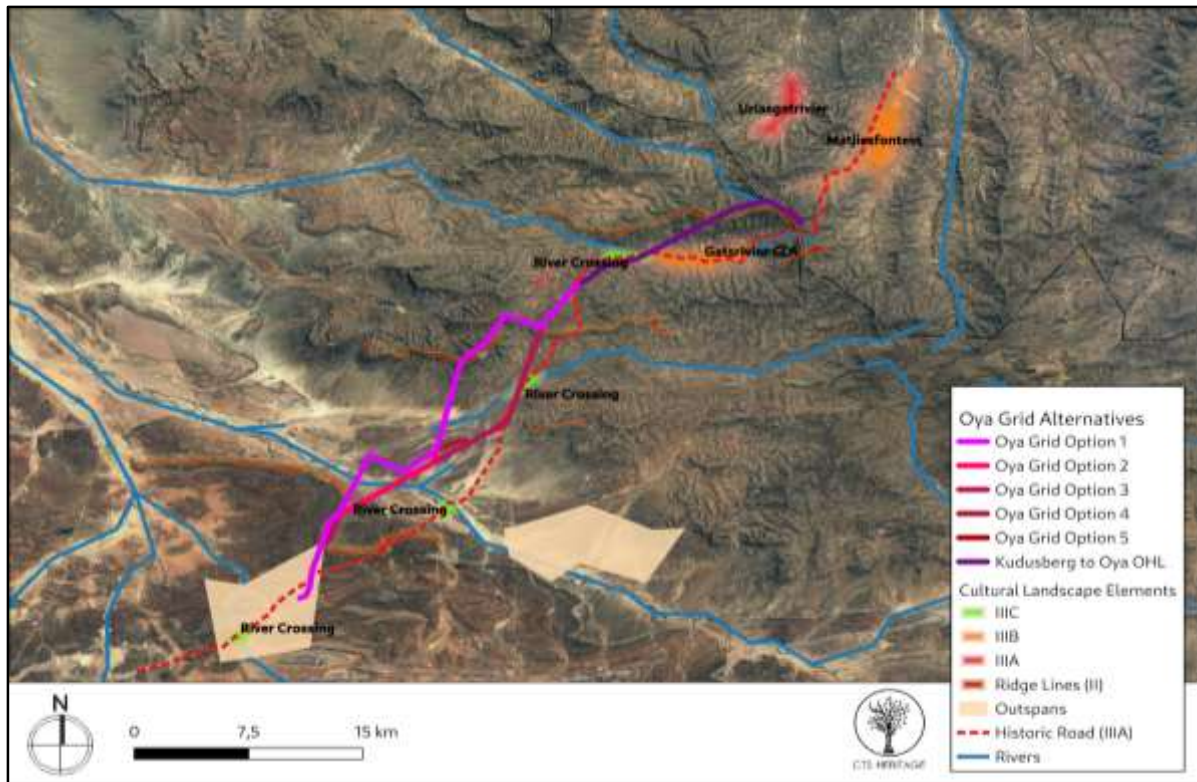


Figure 49: Spatialisation of cultural landscape elements identified by Jansen *et al.*, (2020) and Bailey (2010) in proximity to the proposed development

Historic “Grand Trunk Road” CLA (Graded IIIA)

The farm track that rises out of the Ceres Karoo over the ridge saddle past Muishondberg, passes the Baakens Rivier CLA and runs through the Gats Rivier valley CLA, turning north onto the Oliviersberg ridge slope at the Oliviersberg homestead, over the saddle south of Pad se Hoek, and down into the Matjiesfontein se Kloof valley to the north and beyond to Sutherland, is a noted historic road visible on the Laingsberg Imperial Map dated 1900 - 1919 as a Grand Trunk Road. Although it is an interprovincial road and as such could be given a grading of I or II in its entirety, it is only this section that is the focus of this study and other sections of the road are included in more significant scenic routes. The section of the historic Grand Trunk Road that runs past Baakens River and through Gats Rivier CLAs, is the last section that is open to public access which increases its opportunity for experience by travellers which increases its grading as a site of historical importance as a cultural landscape element. Remnants of stone packed retaining walls of the old road are evident as one travels along certain areas of the current road and are evidence of heritage resources of technical achievement. This road connects the historic farmsteads in the area to each other and would have connected these farmsteads and communities to opportunities for trade and resources with people travelling between Cape Town and Sutherland (and beyond). The route is associated with several cultural landscape areas in the area including both of the CLA’s of the Baakens River study site, as it travels along river courses through valleys, up ridge slopes and over ridge saddles, in so doing connecting these areas in use, memory and function over space and time.

In addition, the proposed power line ends at an existing substation located within a historic outspan called “Platfontein Uitspanning”. Based on an assessment conducted by Jansen et al (2020) that includes this outspan, *“These outspan areas are not only important to understand in terms of its heritage, but also for possible features that might be found on site. Furthermore, it is important to understand the active use within the current cultural landscape, or potential for an active use to be enhanced. It is evident that a substation is located on this piece of outspan area, giving the portion of*

land a “no-mans land” feel to it, which is in line with that of an outspan that aims to serve a communal purpose.”.

Archaeology

An archaeologist conducted a survey of the site and its environs on the 22 October 2020 to determine what archaeological resources are likely to be impacted by the proposed development. A portion of the area proposed for development was not easily accessible, due to restricted road access. As a result, the entirety of the proposed development area was not able to be surveyed. Oya Grid Option 4 is the preferred development option and as such, this alignment was the primary focus of the field assessment. Sampling was implemented and approximately 25km of the area was surveyed by foot.

The findings of the survey were dominated by a diffuse scatter of low density Middle Stone Age (MSA) artefacts spread across the broader landscape. The MSA lithics identified were predominantly made out of silcrete, chert, hornfels and quartzite. The field assessment methodology provides an adequate sample of the kinds of archaeological resources that are to be found along the flatter plains of the Karoo. Overall, the survey has provided a very good account of the range of archaeological material that is present in the area and is entirely consistent with the previous studies for the wind and solar farms that are proposed or already constructed.

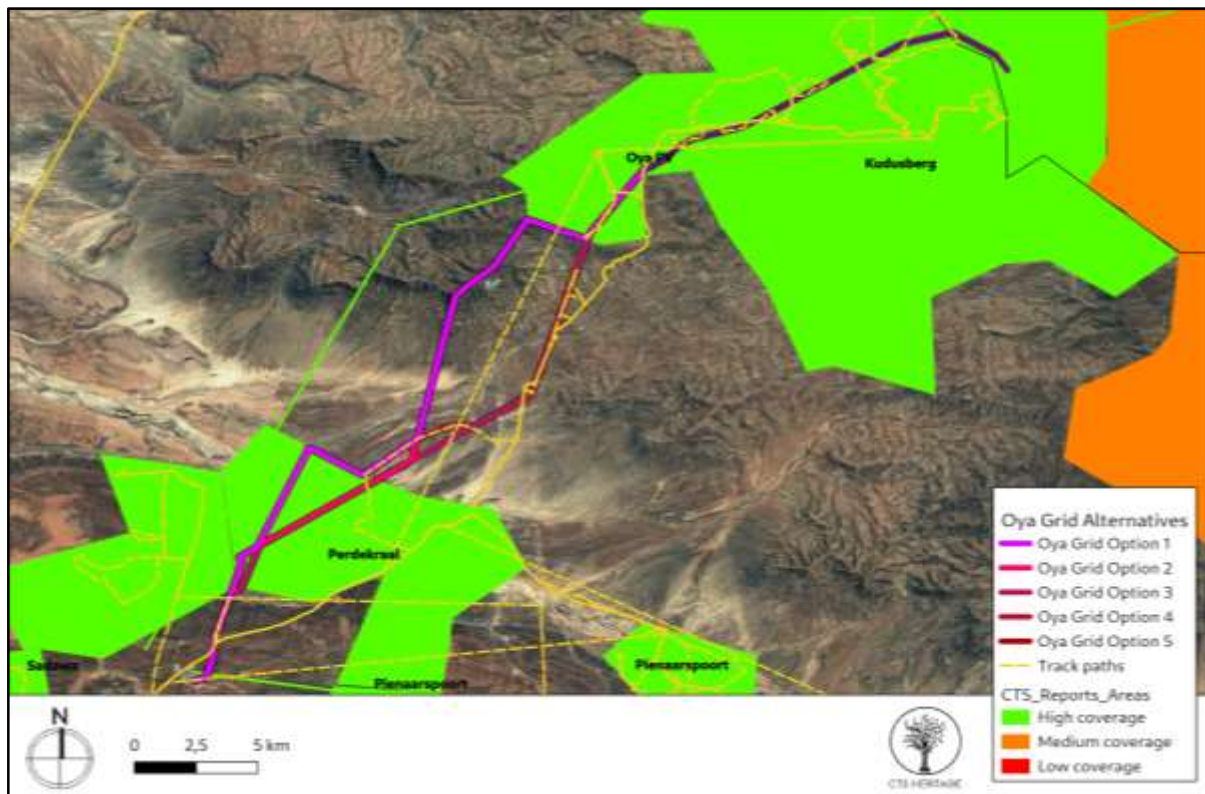


Figure 50: Overall track paths of foot survey overlaid with the areas previously in already approved HIAs

Palaeontology

The proposed development spans over three (3) Groups and five (5) formations. All these formations could contain fossils. These could include Plant fragments, silicified wood, multiple trace fossils, coprolites, crustaceans, arthropods and vertebrate bone fragments.

Of these formations the Abrahams kraal Formation is the most sensitive as it contains the Tapinocephalus Assemblage Zone (AZ) which spans the middle part of the Abrahamskraal Formation. Vertebrate fossils of the Tapinocephalus AZ are not as common as in succeeding biozones and are

usually found as individual specimens in the mudrock sequences in association with, and often enveloped by, brown-weathering calcareous nodular material. This faunal assemblage is mainly represented by small dicynodonts, large dinocephalians, pareiasaurs and pristerognathid therocephalians. The dinocephalians which consist of Synapsida and Therapsida dominated as one of the tetrapod groups in the Middle Permian. The Tapinocephalus AZ in the Main Karoo Basin holds the most abundant record of these dinocephalians. The top of the Abrahamskraal Formation marks the extinction of the dinocephalians. Their disappearance is one of the criteria that marks the beginning of the Pristerognathus AZ.

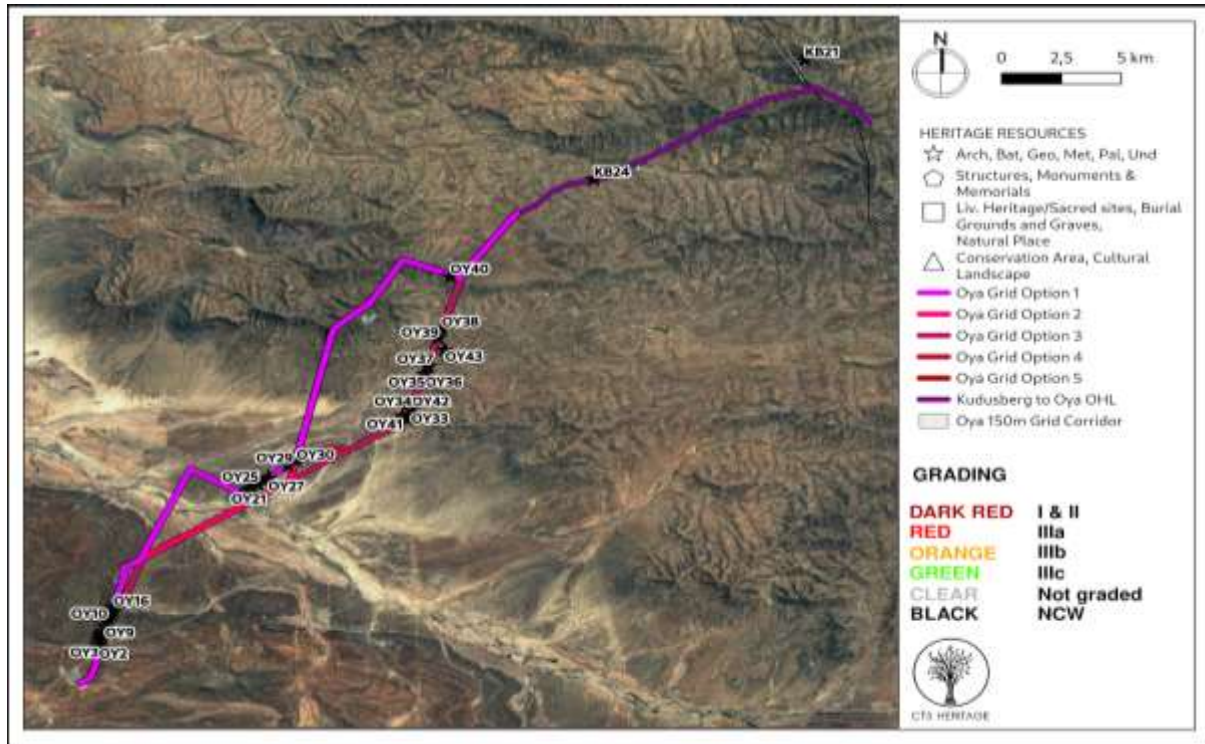


Figure 51: Map of heritage resources identified during the archaeological and palaeontological field assessments relative to the proposed development footprint (see appendices for detailed mapping)

- **Heritage Resources Identified**

Cultural Landscape

The Kuduberg to Oya OHL and the alternatives proposed for the Oya OHL traverse a number of cultural landscape elements that have previously been identified as significant within this portion of the Ceres Karoo. These elements include:

- Ridge Lines (Grade II)
- Baakensrivier Valley CLA (Grade IIIA)
- River confluences (Grade IIIA)
- Portions of the historic trunk road (Grade IIIA)
- The Gatsrivier Cultural Landscape Area (Grade IIIB)
- River crossings (Grade IIIC)
- Platfontein Uitspanning

Archaeology

The archaeological field assessment focused on Oya Grid Alternative 4 as this is the preferred alternative from the developer’s perspective. The methodology used provides a good indication of the kinds of archaeological resources to be impacted by the proposed development along the other proposed alternative routes as well.

The most southerly portion of the survey area (**OYA1-OYA19**) is characterised by flat lying topography with occasional slopes. There is varied shrub cover growing over sandy red soils with scattered sandstone, greywacke boulders and occasional rocky ridges cut by ephemeral streams and sheetwash action. Bioturbation is evident throughout. The distribution of the archaeological finds can be described as a background scatter resulting from the action of surface deflation and ephemeral streams. The highest concentration of finds (**OYA11-OYA16**) was located within an area cut by numerous ephemeral streams and sheet wash activity, therefore were most likely not in their original context. For example, **OYA17** which represents nine (9) silcrete flakes, was located within an ephemeral stream. Archaeological findings **OYA4-OYA10** and **OYA19** were located on a slope cut by ephemeral streams, while **OYA1-OYA3** occurred on residual soils.

The findings **OYA20-OYA30** occurred in an area where the topography was generally flat and covered by sparse vegetation and traversed by jeep tracks. The isolated archaeological finds were likely out of context due to the impact of the well-used jeep tracks. The isolated archaeological resources **OYA31-OYA39** occurred at the base and along a steep slope comprising red soils with scree slope material of greywacke and quartzite rock fragments. The area was cut by several large ephemeral streams and the vegetation was moderate to sparsely developed. In addition, archaeological resources with SAHRIS Site IDs 130730, 130734, 130981 and 131154 are also known to be located within the 300m buffer area.

Palaeontology

No significant fossils were identified during the field analysis. This is mostly due to the soil cover and lack of outcrop in the area. Only four (4) fossils were identified in the field assessment and the fossils found were all silicified wood from the Abrahamskraal Formation. None of the samples were found *in situ*. In addition, palaeontological resources with SAHRIS Site IDs 130760, 130761, 130768 and 130772 are also known to be located within the 300m buffer area.





Figure 52: Soil cover to the south of the proposed development



Figure 53: Lack of outcrop to the south of the proposed development.

Table 24: Summary of geology and palaeontological heritage significance

GPS	GEOLOGY	FOSSILS OBSERVED	COMMENTS	PHOTO
32°56'03.34"S 20°10'36.16"E	Abrahamskraal Formation	Silicified Wood	Not in situ	
32°59'38.86"S 20°09'19.23"E	Abrahamskraal Formation	Silicified Wood	Not in situ	



32°59'27.83"S 20°09'34.20"E	Abrahamskraal Formation	Silicified Wood	Not in situ	
32°57'57.33"S 20°10'27.62"E	Abrahamskraal Formation	Silicified Wood	Not in situ	

Table 25: Heritage resources known to be located within the development area

Site No.	Site Name	Description	Type	Co-ordinates		Grading	Mitigation
OY1	Oya OHL_1	Hornfels flake, MSA	Archaeological	-33,09289	20,01967	NCW	None required
OY2	Oya OHL_2	3 Chert flake, MSA	Archaeological	-33,09225	20,01967	NCW	None required
OY3	Oya OHL_3	2 Hornfels flakes, MSA	Archaeological	-33,09182	20,01962	NCW	None required
OY4	Oya OHL_4	2 Hornfels flakes and 1 chert flake, MSA	Archaeological	-33,09000	20,01976	NCW	None required
OY5	Oya OHL_5	3 Hornfels flakes and 2 Chert flakes, MSA	Archaeological	-33,08886	20,02025	NCW	None required
OY6	Oya OHL_6	5 Hornfels flakes, MSA	Archaeological	-33,08802	20,02066	NCW	None required
OY7	Oya OHL_7	Hornfels flake and patinated silcrete flake, MSA	Archaeological	-33,08728	20,02093	NCW	None required
OY8	Oya OHL_8	Possible handaxe and 2 hornfels flakes	Archaeological	-33,08627	20,02140	NCW	None required
OY9	Oya OHL_9	2 chert flakes, upper grindstone and 2 silicified shale flakes	Archaeological	-33,08415	20,02244	NCW	None required
OY10	Oya OHL_10	Weathered silicified shale	Archaeological	-33,08191	20,02330	NCW	None required
OY11	Oya OHL_11	Hornfels and silcrete flakes, MSA	Archaeological	-33,07911	20,02463	NCW	None required
OY12	Oya OHL_12	4 Silcrete flakes, MSA	Archaeological	-33,07793	20,02531	NCW	None required
OY13	Oya OHL_13	1 hornfels flake and 3 Silcrete flakes, MSA	Archaeological	-33,07740	20,02562	NCW	None required
OY14	Oya OHL_14	6 Silcrete flakes, MSA	Archaeological	-33,07649	20,02571	NCW	None required
OY15	Oya OHL_15	Silcrete flake, MSA	Archaeological	-33,07592	20,02598	NCW	None required
OY16	Oya OHL_16	4 Silcrete flakes, MSA	Archaeological	-33,07565	20,02615	NCW	None required

OY17	Oya OHL_17	9 Silcrete flakes, MSA	Archaeological	-33,07686	20,02558	NCW	None required
OY18	Oya OHL_18	Silcrete LSA flake?	Archaeological	-33,07856	20,02481	NCW	None required
OY19	Oya OHL_19	Hornfels flake, MSA	Archaeological	-33,08073	20,02390	NCW	None required
OY20	Oya OHL_20	Chert flake	Archaeological	-33,02648	20,08604	NCW	None required
OY21	Oya OHL_21	Chert flake, MSA	Archaeological	-33,02610	20,08660	NCW	None required
OY22	Oya OHL_22	Chert flake, MSA	Archaeological	-33,02586	20,08704	NCW	None required
OY23	Oya OHL_23	2 chert flakes, MSA	Archaeological	-33,02533	20,08787	NCW	None required
OY24	Oya OHL_24	Hornfels flake, MSA	Archaeological	-33,02481	20,08868	NCW	None required
OY25	Oya OHL_25	Quartzite flake, MSA	Archaeological	-33,02342	20,09091	NCW	None required
OY26	Oya OHL_26	Chert flake, MSA	Archaeological	-33,02198	20,09331	NCW	None required
OY27	Oya OHL_27	Chert flake, MSA	Archaeological	-33,02074	20,09533	NCW	None required
OY28	Oya OHL_28	Quartzite flake, MSA	Archaeological	-33,02055	20,09564	NCW	None required
OY29	Oya OHL_29	Chert flake, MSA	Archaeological	-33,01526	20,10425	NCW	None required
OY30	Oya OHL_30	Chert flake, MSA	Archaeological	-33,01302	20,10800	NCW	None required
OY31	Oya OHL_31	Chert flake, MSA	Archaeological	-32,99546	20,15786	NCW	None required
OY32	Oya OHL_32	Pieces of fossil wood	Palaeontological	-32,99533	20,15791	NCW	None required
OY33	Oya OHL_33	Ceramic sherd	Archaeological	-32,99171	20,15925	NCW	None required

OY34	Oya OHL_34	Piece of fossil wood	Palaeontological	-32,99107	20,15950	NCW	None required
OY35	Oya OHL_35	Chert flake, MSA	Archaeological	-32,97612	20,16534	NCW	None required
OY36	Oya OHL_36	Pieces of ostrich egg shell	Modern	-32,97608	20,16535	NCW	None required
OY37	Oya OHL_37	Ceramic sherd	Archaeological	-32,97281	20,16700	NCW	None required
OY38	Oya OHL_38	Silcrete flake, MSA	Archaeological	-32,95695	20,17280	NCW	None required
OY39	Oya OHL_39	Chert flake, MSA	Archaeological	-32,96062	20,17138	NCW	None required
OY40	Oya OHL_40	Silicified Wood from the Abrahamskraal Formation, <i>ex situ</i>	Palaeontological	-32.9343	20.1767	NCW	None required
OY41	Oya OHL_41	Silicified Wood from the Abrahamskraal Formation, <i>ex situ</i>	Palaeontological	-32.9941	20.1553	NCW	None required
OY42	Oya OHL_42	Silicified Wood from the Abrahamskraal Formation, <i>ex situ</i>	Palaeontological	-32.9911	20.1595	NCW	None required
OY43	Oya OHL_43	Silicified Wood from the Abrahamskraal Formation, <i>ex situ</i>	Palaeontological	-32.9659	20.1743	NCW	None required
KB21	Kudusberg WEF_21	Chert adze, single piece no other artefacts evident	Archaeological	-32.8413	20.33519	NCW	None required
KB24	Kudusberg WEF_24	Chert core, Only minor flaking around edges	Archaeological	-32.89265	20.24085	NCW	None required
130730	OYPV-09	Three grave features including a medium-density scatter of MSA and LSA stone tools	Archaeological	-32.909831	20.202653	IIIA	100m buffer to ensure no impact
130734	OUPV-13	Several LSA stone tools were found scattered over an area of 107,23m ² near the river on the farm Gats Rivier 156. The flakes were made from chert and shale.	Archaeological	-32.898217	20.224189	NCW	None required

130768	BKRN031	Waterford Formation. Good riverbed and bank exposures of tabular, greyish wackes with undulose or wave-rippled tops. Thin, fissile, medium-grained, laminated, greyish sandy interbeds, locally ferruginised, towards base of package of medium- to thick-bedded wackes (horizontally to current ripple cross-laminated) containing dense hash of transported plant debris – mainly stems, including probable sphenophytes - preserved as moulds where weathered and carbonaceous compressions in fresher material. Some possible axes up to 10 cm across.	Palaeontological	-32.909361	20.201889	IIIA	50m buffer
130772	BKRN034	Waterford Formation. Hillslope exposure of grey-green mudrocks with large ferruginous carbonate diagenetic concretions and package of tabular, thin-bedded wackes. Small float block of silicified wood.	Palaeontological	-32.933389	20.177833	IIIC	50m buffer to ensure no impact
130981	KDB012	Circular cobble-built structure, piled stone, likely hut or shelter	Structure	-32.864056	20.308778	IIIC	50m buffer to ensure no impact
131154	KDB134	Chert core	Archaeological	-32.892650,	20.240850	NCW	None required
130760	BKNR023	Lower Abrahamskraal Fm Riverine (probably Combrinskraal Member equivalent). Exposure of well-jointed top and interior of thick, medium-grained channel sandstone with dispersed moulds of plant debris including indeterminate plant axes up to several cm wide, tongue-shaped glossopterid leaves, some retaining an original spatulate 3D morphology (uncompressed), clear midrib but fine venation on lamina is very faint or absent. Associated thin mudflake intraclast breccias	Palaeontological	-32.893528	20.243944	IIIB	50m buffer to ensure no impact
130761	BKNR024	Lower Abrahamskraal Fm Riverine (probably Combrinskraal Member equivalent). Excellent steep streambank sections through thick, tabular-bedded channel sandstone complex with well-developed coarse, poorly-sorted, monomict / oligomict mudrock intraclast breccias up to 2m or so	Palaeontological	-32.893694	20.243444	IIIA	50m buffer to ensure no impact

		thick at several horizons, locally with sharply erosive bases cutting down into tabular-bedded sandstones (No reworked calcrete or fossils seen in situ within breccias)					
NA	NA	Gatsrivier CLA	Cultural Landscape	-32.8919	20.2905	IIIB	No go area
NA	NA	Historic road river crossings	Cultural Landscape	NA	NA	IIIC	100m buffer
NA	NA	River Confluences	Cultural Landscape	NA	NA	IIIB	100m buffer
NA	NA	Baakensriver CLA	Cultural Landscape	-32.9015	20.1859	IIIA	No go area
NA	NA	Ridge lines	Cultural Landscape	NA	NA	II	
NA	NA	Historic trunk road	Cultural Landscape	NA	NA	IIIA	50m buffer
NA	NA	Outspan	Cultural Landscape	NA	NA	NA	None required

- Mapping and spatialisation of heritage resources

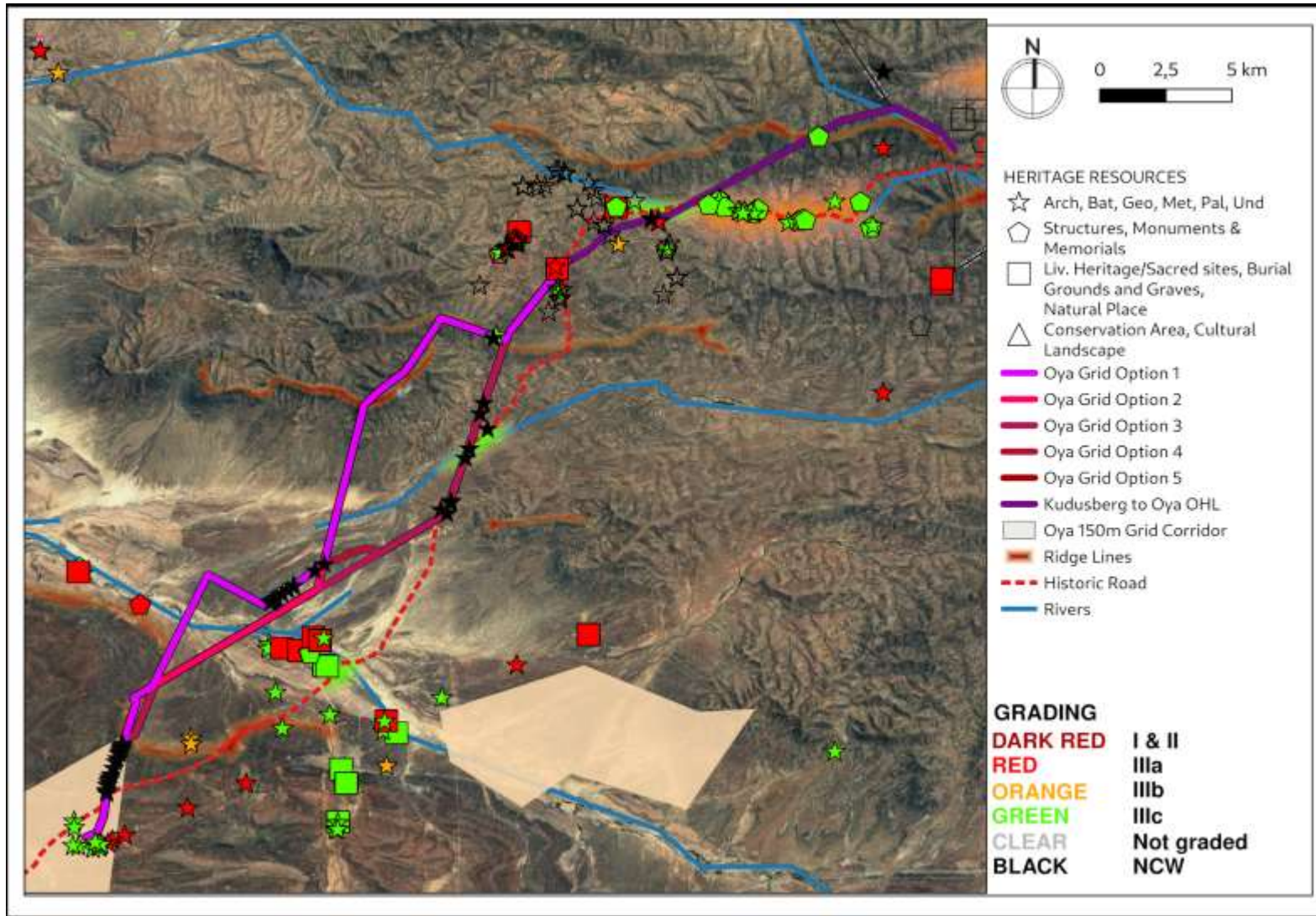


Figure 54: All known heritage resources located within the proposed development

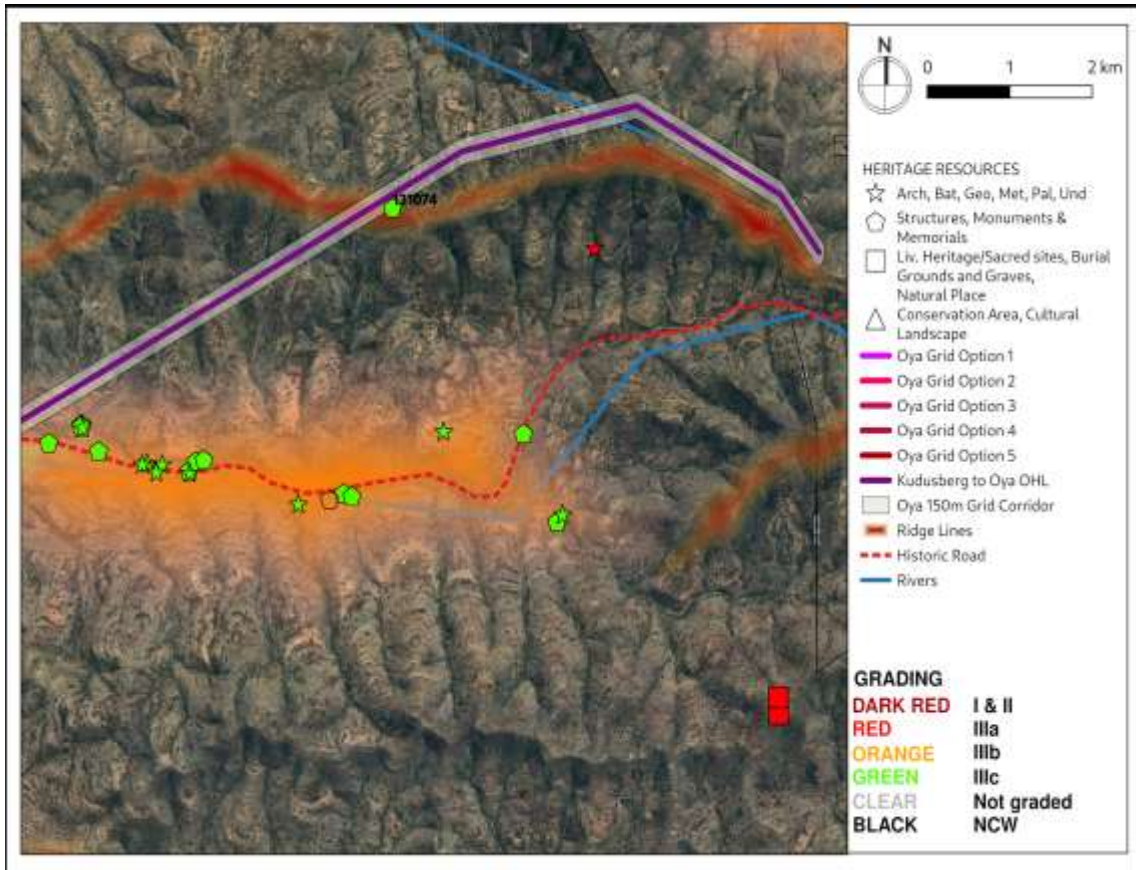


Figure 55: All known heritage resources located within the proposed development

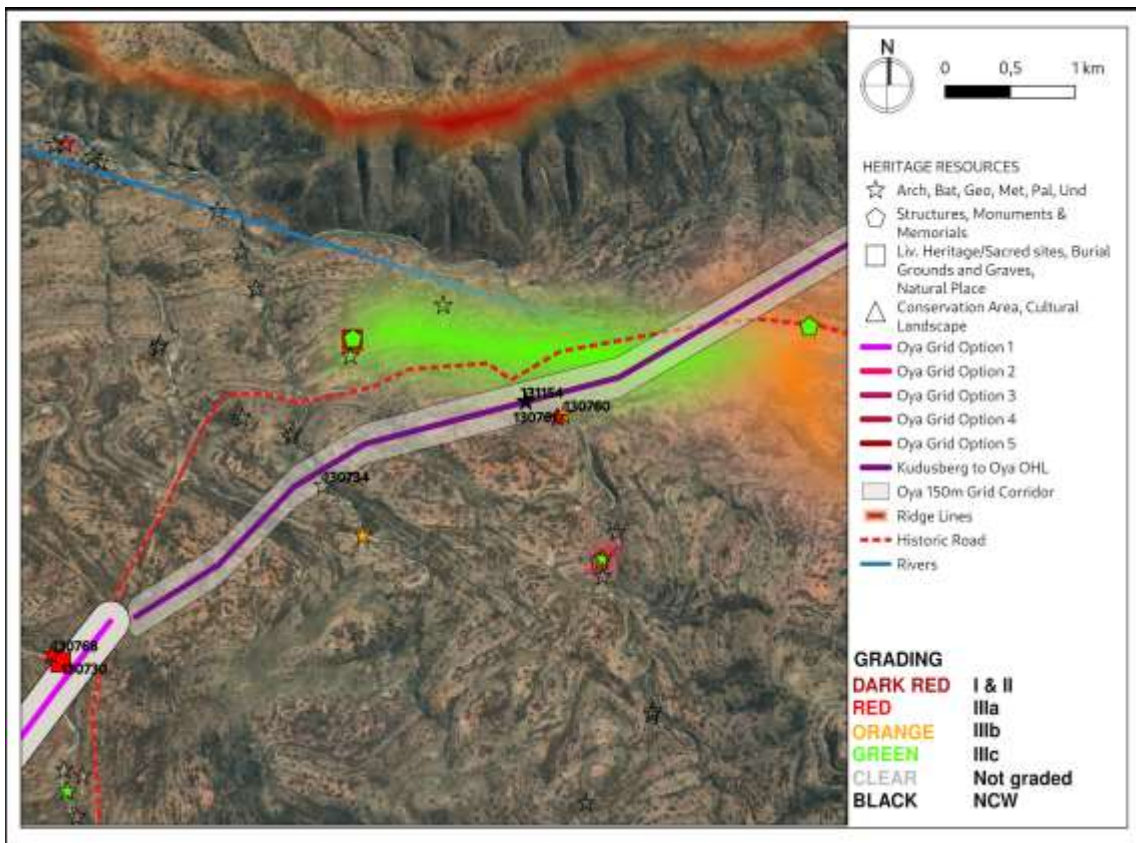


Figure 56: All known heritage resources located within the proposed development

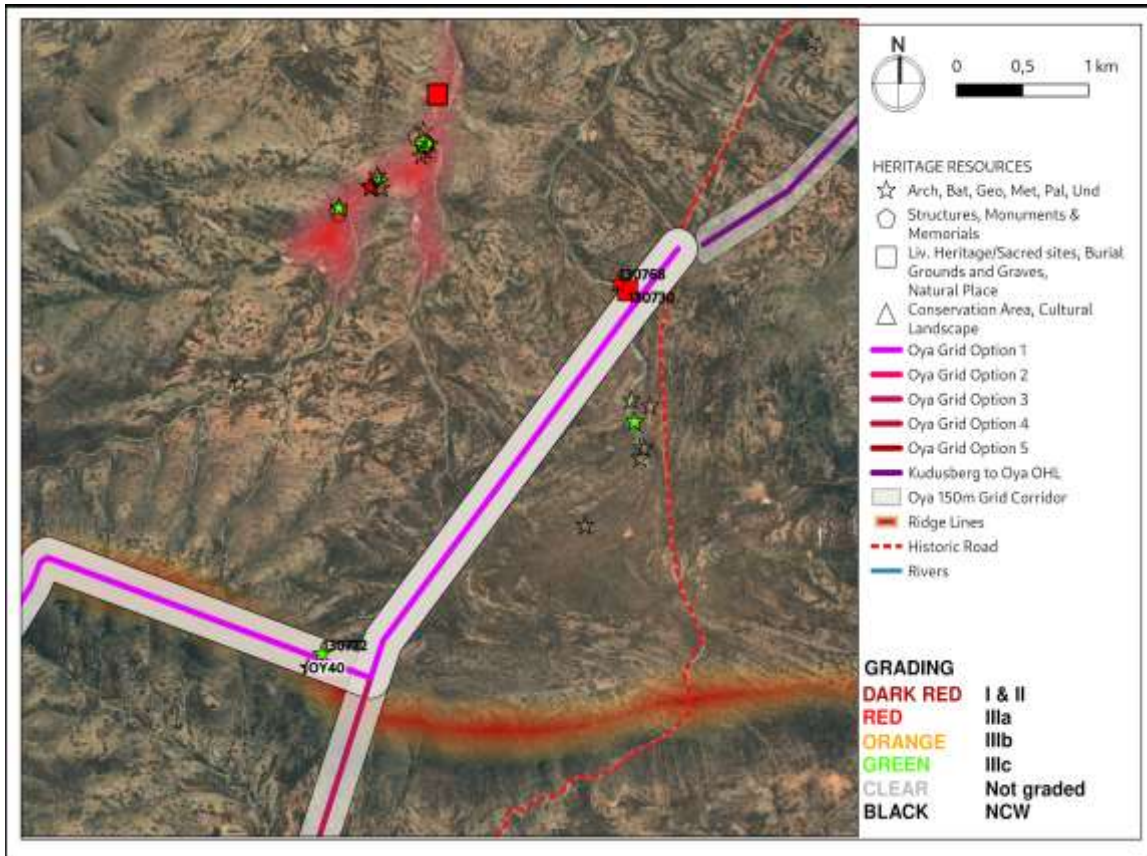


Figure 57: All known heritage resources located within the proposed development



Figure 58: All known heritage resources located within the proposed development



Figure 59: All known heritage resources located within the proposed development

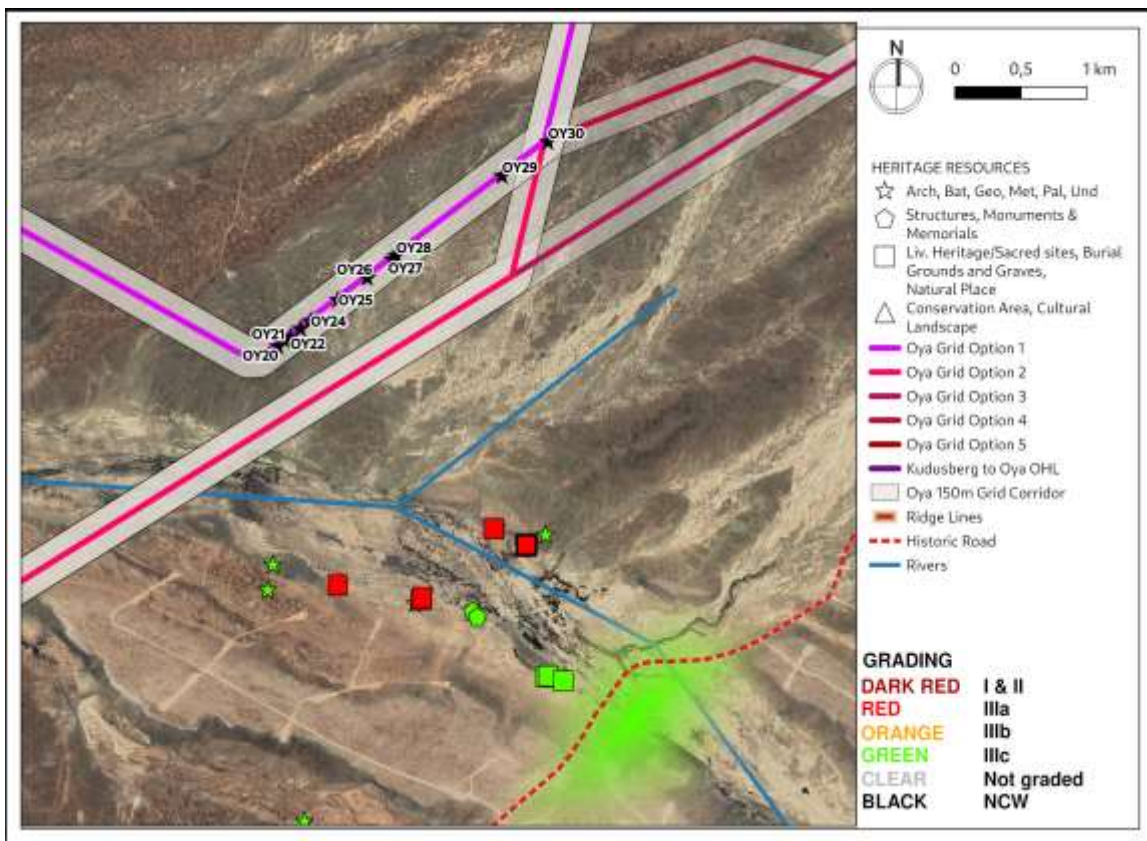


Figure 60: All known heritage resources located within the proposed development

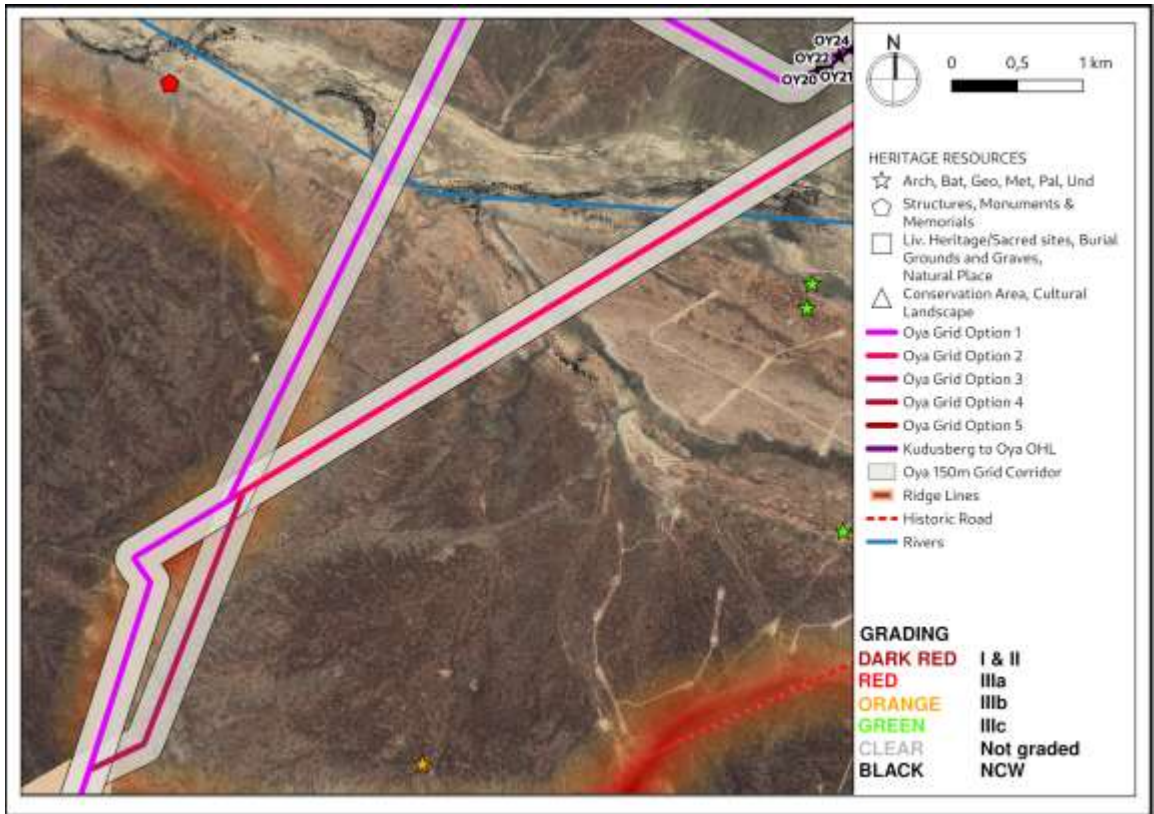


Figure 61: All known heritage resources located within the proposed development

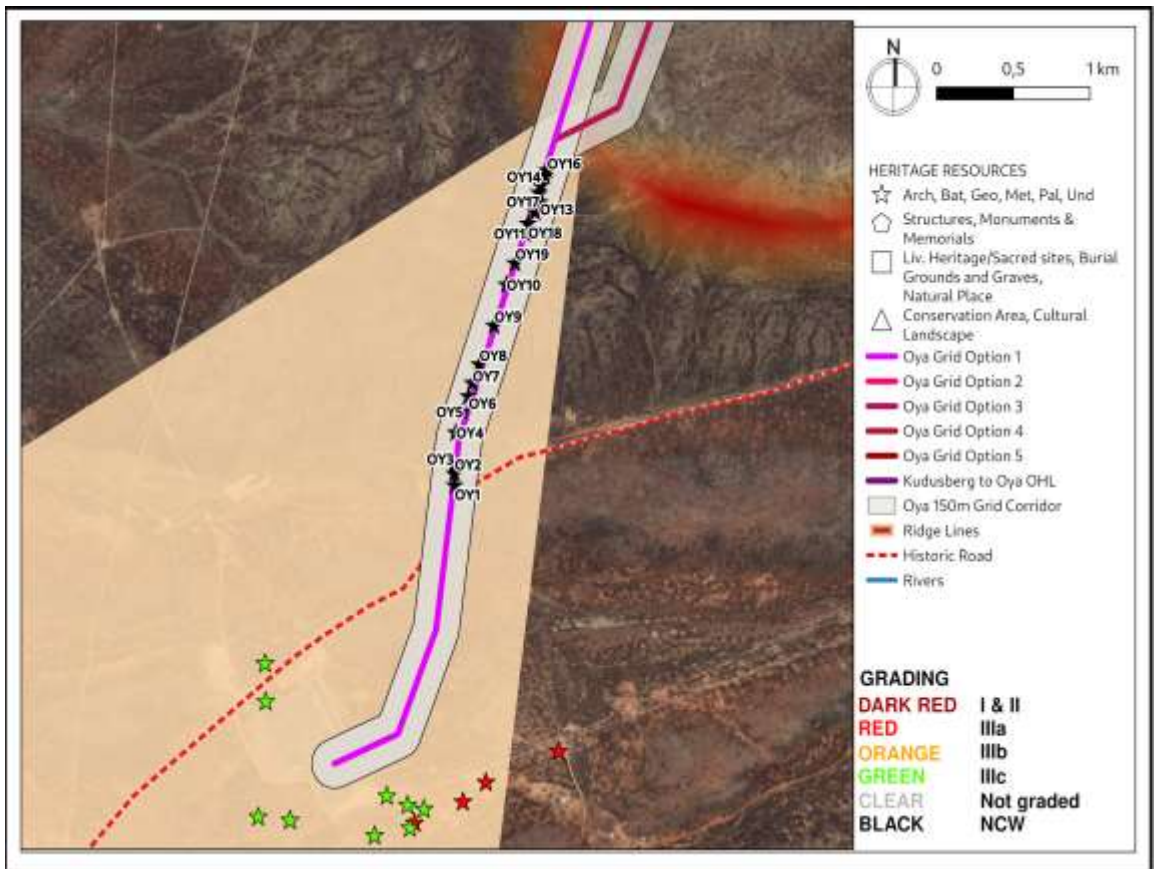


Figure 62: All known heritage resources located within the proposed development

6.12 Socio-Economic

The Socio-Economic Impact Assessment was conducted by Dr Neville Bews & Associates. The full Social Impact Assessment Report is included in **Appendix 6F**. The Socio-Economic Impact Assessment was undertaken via desktop means. The findings are detailed in the report dated 05 November 2020 (**Appendix 6F**).

The environmental baseline from a social perspective is presented below.

6.12.1 Baseline Information

The project falls within Witzenberg Non-Urban (NU), Main Place 1650094 (Census, 2011) and Ward 12 of the Witzenberg Local Municipality located within the Cape Winelands District Municipality and the Western Cape Province. A small section of the power line crosses provincial borders and is situated on the Remainder of the Farm Matjes Fontein No 194 (RE/194) located within the Karoo Hoogland NU, Main Place 367002 (Census, 2011) and Ward 3 of the Karoo Hooglands Local Municipality. The Karoo Hoogland is in turn located within the Namakwa District Municipality in the Northern Cape Province.

A screening report for an environmental authorisation as required by the 2014 EIA Regulations (as amended) was undertaken in respect of the proposed development footprint's environmental sensitivity. In this respect, no social sensitive issues were highlighted. This report is attached as Appendix 2 in the Socio-Economic Impact Assessment Report (**Appendix 6F**).

The demographics pertaining to the provincial and municipal areas, as sourced from Statistics South Africa, are described below.

6.12.2 Provincial

The Western Cape Province covers a geographical area of 129 462.21 km² and, with a population of 5 82 734, according to Census 2011 (Statistics South Africa, 2011), had a population density of 44.98 people per km² in 2011. The Northern Cape Province covers an area of 372 889.36 km² and, over the same period, had a population of 1 145 861 giving it a population density of 3.07 people per km². Regarding age structure, 25.1% of the population of the Western Cape are below 16 years, while 69% are between 15 and 64 years of age and 5.9% are above 64 years. The corresponding figures pertaining to the Northern Cape are as follows; below 16 years = 30.1%, between 15 and 64 years = 64.2% and above 64 years = 5.7%.

6.12.3 Municipal

The project affects the two (2) district municipalities of Namakwa in the Northern Cape and the Cape Winelands in the Western Cape Province, as well as their respective local municipalities of the Karoo Hooglands and Witzenberg.

Cape Winelands District Municipality: The district which covers an area of 21 472.67 km², incorporates the following local municipalities:

- Breede Valley

- Drakenstein
- Langeberg
- Stellenbosch
- Witzenberg

The following towns are also located within the Cape Winelands:

Ashton	Bonnievale	Ceres	De Doorns
Franschhoek	Gouda	Klapmuts	McGregor
Montagu	Op-Die-Berg	Paarl	Pniel
Prince Alfred Hamlet	Rawsonville	Robertson	Saron
Stellenbosch	Stellenbosch Farms	Touws River	Tulbagh
Wellington	Wolseley	Worcester	

The district is regarded as the premier wine growing area with an ideal microclimate created by the mountains surrounding the towns of Stellenbosch and Franschhoek. On an economic basis the following sectors contribute to the economy of the district:

- Finance and business services (23.9%)
- Manufacturing (19.6%)
- Wholesale and retail trade (15.2%)
- Agriculture, forestry and fishing (13.1%)
- Transport and communication (9%)
- Construction (4.5%).

The district also attracts numerous tourists.

With a population of 787 490 people, the Cape Winelands DM has a population density of 36.7/km². According to Census, 2011, the district has a sex ratio of 97.2 with 25.8% of the population being under 15 years; 69.0% being between 15 and 65 years and 5.1% being over 65 years of age.

The demographic data pertaining to the Cape Winelands District Municipality, based on both Census 2011 and Community Survey 2016 as sourced through Statistics South Africa, is presented below.

Community Survey		Census
Population	866 001	787 486
Age Structure		
Population under 15	26.6%	25.8%
Population 15 to 64	68.9%	69.0%
Population over 65	4.4%	5.1%
Dependency Ratio		
Per 100 (15-64)	45.1	44.9
Sex Ratio		
Males per 100 females	98.3	97.2
Population Growth		
Per annum	2.16%	n/a
Labour Market		
Unemployment rate (official)	n/a	n/a

Community Survey		Census
Youth unemployment rate (official) 15-34	n/a	n/a
Education (aged 20 +)		
No schooling	2.5%	4.2%
Matric	30.0%	23.5%
Higher education	9.0%	10.0%
Household Dynamics		
Households	235 906	198 258
Average household size	3.7	3.7
Female-headed households	34.2%	33.2%
Formal dwellings	81.0%	82.3%
Housing owned	48.7%	41.2%
Household Services		
Flush toilet connected to sewerage	93.5%	86.7%
Weekly refuse removal	81.8%	79.9%
Piped water inside the dwelling	77.3%	75.9%
Electricity for lighting	94.1%	92.8%

Namakwa District Municipality: Namakwa covers an area of 126 836 km² incorporating the following local municipalities:

- Hantam Local Municipality
- Kamiesberg Local Municipality
- Karoo Hoogland Local Municipality
- Khai-Ma Local Municipality
- Nama Khoi Local Municipality
- Richtersveld Local Municipality.

The following towns are also located within Namakwa:

Aggeneys	Alexander Bay	Brandvlei	Bulletrap
Calvinia	Carolusberg	Concordia	Eksteensfontein
Frasersburg	Garies	Hondeklip Bay	Kamieskroon
Kleinsee	Koingnaas	Komaggas	Kuboes
Leliefontein/Kamiesberg	Loeriesfontein	Middelpos	Nababeep
Nieuwoudtville	O'Kiep	Onderste Doorns	Pella
Pofadder	Port Nolloth	Richtersveld	Sanddrift
Springbok	Steinkopf	Sutherland	Williston

The main economic activities of the district include:

- Agriculture
- Tourism

The Namakwa district had a population of 115 842 people in 2011 resulting in a population density of 0.91/km² and had a sex ratio of 101.2. Of this population, 25.8% were under 16 years of age; 66.1% were between 15 and 64 years and 8.1% over the age of 64.

The demographic data pertaining to the Namakwa District Municipality, based on both Census 2011 and Community Survey 2016, is presented below.

	Community Survey	Census
	2016	2011
Population	115 488	115 842
Age Structure		
Population under 15	22.5%	25.8%
Population 15 to 64	68.0%	66.1%
Population over 65	9.5%	8.1%
Dependency Ratio		
Per 100 (15-64)	47.1	51.2
Sex Ratio		
Males per 100 females	101.5	101.2
Population Growth		
Per annum	-0.07%	n/a
Labour Market		
Unemployment rate (official)	n/a	20.1%
Youth unemployment rate (official) 15-34	n/a	25.4%
Education (aged 20 +)		
No schooling	4.4%	6.6%
Matric	24.2%	18.8%
Higher education	8.0%	7.4%
Household Dynamics		
Households	37 669	33 856
Average household size	3.1	3.2
Female-headed households	37.6%	36.6%
Formal dwellings	95.2%	93.8%
Housing owned	72.6%	60.1%
Household Services		
Flush toilet connected to sewerage	67.9%	57.9%
Weekly refuse removal	81.7%	80.1%
Piped water inside the dwelling	70.5%	63.3%
Electricity for lighting	88.4%	86.5%

Witzenberg Local Municipality: Situated some 150 km north-east of Cape Town and covering a geographical area of 10 753 km². Witzenberg is the largest of the local municipalities within the Cape Winelands district. The following towns are located within Witzenberg:

- Op-die-Berg
- Prince Alfred Hamlet
- Tulbagh

- Wolseley

The municipality also administers the following rural areas:

- Agter-Witzenberg
- The northern portion of the Breede River Valley (Het Land van Waveren)
- Koue Bokkeveld
- Warm Bokkeveld

The following economic sectors form the basis of the municipal economy:

- Agriculture, forestry and fishing (29.1%)
- Finance, insurance
- Real estate and business services (22%)
- Manufacturing (16.2%)
- Wholesale and retail trade, catering and accommodation (10%)
- General government (8.4%)
- Transport, storage and communication (8%)
- Community, social and personal services (3.5%)

With a population of 115 946 people, the Witzenberg LM has a population density of 1 078/km². According to Census, 2011, the district has a sex ratio of 105.6 with 25.4% of the population being under 15 years; 70.4% being between 15 and 65 years and 4.2% being over 65 years of age.

The demographic data pertaining to the Witzenberg Local Municipality, based on both Census 2011 and Community Survey 2016, is presented below:

	Community Survey	Census
Population	130 548	115 946
Age Structure		
Population under 15	25.5%	25.4%
Population 15 to 64	70.9%	70.4%
Population over 65	3.5%	4.2%
Dependency Ratio		
Per 100 (15-64)	41.0	42.0
Sex Ratio		
Males per 100 females	108.4	105.6
Population Growth		
Per annum	2.70%	n/a
Labour Market		
Unemployment rate (official)	n/a	7.6%
Youth unemployment rate (official) 15-34	n/a	9.9%
Education (aged 20 +)		
No schooling	3.7%	6.6%
Matric	24.7%	18.2%
Higher education	5.9%	5.8%
Household Dynamics		

	Community Survey	Census
Households	35 976	27 419
Average household size	3.6	3.4
Female-headed households	29.3%	28.9%
Formal dwellings	83.3%	86.2%
Housing owned	42.8%	34.5%
Household Services		
Flush toilet connected to sewerage	92.4%	86.9%
Weekly refuse removal	87.1%	69.9%
Piped water inside the dwelling	82.2%	78.8%
Electricity for lighting	94.5%	93.4%

Ward 12 of Witzenberg Local Municipality: Statistics SA data available for Ward 12 of Witzenberg LM is only available in respect of Census 2011. On this basis, the Ward 12 covers an area of 6 551.2 km² and has a population of 8 096 people resulting in a population density of 1.2/km². The median age of the population is 26 years, with 27% being under 18; 70% being between 18 and 64 and 3% being 65 and over. With a sex ratio of 126.5, there are a higher proportion of males to females across the ward.

In respect of population group, at 49% coloured people are the most prevalent population group in the ward followed by black African and white people at 42% and 8% respectively. At 54%, Afrikaans is the predominant home language spoken across the ward, followed by isiXhosa at 31%. Concerning levels of education, 41.8% of the population has completed Grade 9 or higher and 15% have completed Matric or higher with 82.6% of school-aged children, between 5 and 17 years, attending school.

There are 2 275 households within Ward 12 of which 13.1% live within informal dwellings; 9.5% of dwellings are fully owned or are being paid off, and 49% are occupied rent-free. The average annual household income of the ward is R 29 400. Of these households, 42.5% receive water from a regional or local service provider; 92% have access to flush or chemical toilets; 39.9% are receiving a refuse disposal service from a local authority or private company, while 45% utilise their own refuse dump.

In 2011, 63% of the population was employed of which 33% was employed within the informal and 63% within the formal sectors.

Karoo Hoogland Local Municipality: The Karoo Hoogland covers a geographical area of 30 230 km² and incorporates the following towns:

- Frasersburg
- Sutherland
- Williston

The economy of the area is based on:

- Community, social and personal services (42.5%)
- Transport, storage and communication (15%)
- Wholesale and retail trade, catering and accommodation (13.7%)
- Agriculture, forestry and fishing (13%)
- Finance, insurance, real estate and business services (8.8%)
- Manufacturing (5.9%).

With a population of 12 501 people in the Karoo Hoogland, the population density of the municipality is 0.41/km². Of this population, 27.8% were under 16 years of age in 2011, while 62.2% were between 15 and 64 years and 10% were over the age of 64 years.

The demographic data pertaining to the Karoo Hoogland Local Municipality, based on both Census 2011 and Community Survey 2016 as sourced through Stats SA, is presented below.

	Community Survey	Census
Population	13 009	12 501
Age Structure		
Population under 15	25.0%	27.8%
Population 15 to 64	64.0%	62.2%
Population over 65	11.0%	10.0%
Dependency Ratio		
Per 100 (15-64)	56.2	60.8
Sex Ratio		
Males per 100 females	100.7	98.6
Population Growth		
Per annum	0.91%	n/a
Labour Market		
Unemployment rate (official)	n/a	n/a
Youth unemployment rate (official) 15-34	n/a	n/a
Education (aged 20 +)		
No schooling	13.1%	17.2%
Matric	25.8%	16.0%
Higher education	11.5%	7.9%
Household Dynamics		
Households	4 620	3 799
Average household size	2.8	3.0
Female-headed households	32.4%	31.0%
Formal dwellings	99.4%	96.9%
Housing owned	68.1%	47.4%
Household Services		
Flush toilet connected to sewerage	39.7%	39.7%
Weekly refuse removal	58.3%	63.4%
Piped water inside the dwelling	75.2%	59.7%
Electricity for lighting	67.5%	65.5%

Ward 3 Karoo Hoogland Local Municipality: Statistics SA data available for Ward 3 of Witzenberg LM is only available in respect of Census 2011. On this basis, the Ward 3 covers an area of 27 791.2 km² and has a population of 3 171 people resulting in a population density of 0.1/km². The

median age of the population is 37.5 years with 24% being under 18; 67% being between 18 and 64 and 9% being 65 and over. With a sex ratio of 118.1, there are a higher proportion of males to females across the ward.

In respect of population group, at 68% coloured people are the most prevalent population group in the ward followed by white and black African people at 29% and 3% respectively. At 96% Afrikaans is the predominant home language spoken across the ward, followed by English at 2%. Concerning levels of education, 41.3% of the population has completed Grade 9 or higher and 28.8% have completed Matric or higher with 51.2% of school-aged children, between 5 and 17 years, attending school.

There are 1 405 households within Ward 3 of which 1.8% live within informal dwellings; 24% of dwellings are fully owned or are being paid off and 55% are occupied rent-free. The average annual household income of the ward is R 29 400. Of these households, 82% source water from a borehole; 56% have access to flush or chemical toilets; 11.4% are receiving a refuse disposal service from a local authority or private company, while 82% utilise their own refuse dump.

In 2011 64.4% of the population were employed of which 26% were employed within the informal and 65% within the formal sectors.

6.12.4 Project Footprint

Most of these properties are located within Witzenberg non-urban (NU) area, Sub Place 165001001 (Census, 2011) and Ward 12 of the Witzenberg Local Municipality. However, one property; the Remainder of the Farm Matjes Fontein No 194 (RE/194) is located within the Karoo Hoogland NU Sub Place 367002001 (Census, 2011) and Ward 3 of the Karoo Hooglands Local Municipality.

The area is sparsely populated with Witzenberg NU having a population density of 4.91/km² and the Karoo Hoogland NU a population density of 0.10/km².

6.12.5 Towns in the Area

The closest urban areas to the site of the project are the towns of:

- Sutherland
- Matjiesfontein
- Laingsburg

Sutherland

The town of Sutherland, founded in 1857, served as a centre for the sheep farming industry in the area. Recent economic activities in the town have been spurred on by the establishment of the South African Astronomical Observatory in the area. This has resulted in an increase in tourism to the region which has driven up the demand for accommodation and eating establishments such as bars and restaurants. This greater interest being shown towards the region has also driven up property values in and around the town.

Matjiesfontein

The town of Matjiesfontein, which falls within the Laingsburg Local Municipality and owes its origins to the railway, was established in the 1880s. Matjiesfontein's Victorian character was preserved, and the town was declared a National Monument in 1975 with the railway station and cemetery subsequently being declared National Monuments in 1984 and 1994 respectively. On an economic basis, apart from

servicing as a centre for farmers in the area, the town also has a high tourist attraction associated with its preserved Victorian charm. This has resulted in the hospitality industry being relatively active in the area with such establishments as The Lord Milner Hotel regarded as attractive tourist destinations.

Laingsburg

The town of Laingsburg, which together with the towns of Matjiesfontein, Bergsig and Goldnerville make up the Laingsburg Local Municipality, is located along the National Road 1 (N1), which runs the entire length of South Africa, between Cape Town and the Beit Bridge border post. On an economic level, Laingsburg serves as an agricultural centre for farmers in the region with agricultural activities such as livestock farming (goats and sheep) crops (alfalfa or Lucerne) as well as fruit and vegetables.

6.13 Visual

The Visual Assessment (VIA) was conducted by Kerry Schwartz of SiVEST. The full VIA Report is included in **Appendix 6G**. The VIA has not been externally reviewed as the specialist is regarded as independent, has no vested interest in the project and receives fair and normal remuneration for the work. Based on recent correspondence with the DEFF, it was confirmed that this would be acceptable, provided all specialists sign a DoI. A signed DoI from the specialist who undertook the VIA is provided in **Appendix 3**. Proof of confirmation in this regard from the DEFF is provided in **Appendix 9D**.

Defining the visual character of an area is an important factor in the assessment of visual impacts as it establishes the visual baseline or existing visual environment in which the development would be constructed. The visual impact of a development is measured by establishing the degree to which the development would contrast with, or conform to, the visual character of the surrounding area. The inherent sensitivity of the area to visual impacts or visual sensitivity is thereafter determined, based on the visual character, the economic importance of the scenic quality of the area, inherent cultural value of the area and the presence of visual receptors.

Physical and land use related characteristics, as outlined below, are important factors contributing to the visual character of an area.

6.13.1 Physical and Land Use Characteristics

Topography

Areas of flatter relief, including the plains and the higher-lying plateaus, are characterised by wide ranging vistas (**Figure 63**), although views to the north and south will be somewhat constrained by the hilly terrain in these sectors of the study area which enclose the visual envelope. In the hillier and higher-lying terrain, the vistas will depend on the position of the viewer. Viewers located within some of the more incised valleys for example, would have limited vistas, whereas a much wider vista would be experienced by viewers on higher-lying ridge tops or slopes. Importantly in the context of this study, the same is true of objects placed at different elevations and within different landscape settings. Objects placed on high-elevation slopes or ridge tops would be highly visible, while those placed in valleys or enclosed plateaus would be far less visible.

Bearing in mind that power line towers and substations are large structures (potentially up to 45 m in height), these elements of the grid connection could be visible from an extensive area around the grid connection infrastructure. Topographic shielding in the north-eastern sector would reduce the visibility of the power lines and substations from many of the locally occurring receptor locations. Across the

south-western sector of the study area however there would be very little topographic shielding to lessen the visual impact of the proposed power line and substations.



Figure 63: View west-south-west from the southern section of the study area (-33.066028S; 20.090783E) showing wide-ranging vistas experienced from higher elevations.

GIS technology was used to undertake a preliminary visibility analysis for the proposed power line routes and substation sites. This analysis was based on points at 250 m intervals along the centre line of the corridor alternatives, and assumes a tower height of 45 m. The resulting viewshed indicates the geographical area from where the proposed power lines and substation sites would theoretically be visible, i.e. the zone of visual influence. This analysis is based entirely on topography (relative elevation and aspect) and does not take into account any existing vegetation cover or built infrastructure which may screen views of the proposed development. In addition, detailed topographic data was not available for the broader study area and as such the viewshed analysis does not take into account any localised topographic variations which may constrain views. This analysis should therefore be seen as a conceptual representation or a worst case scenario.

The results of this analysis, as per **Figure 64** below, show that elements of the proposed grid connection infrastructure would be visible from most parts of the study area.

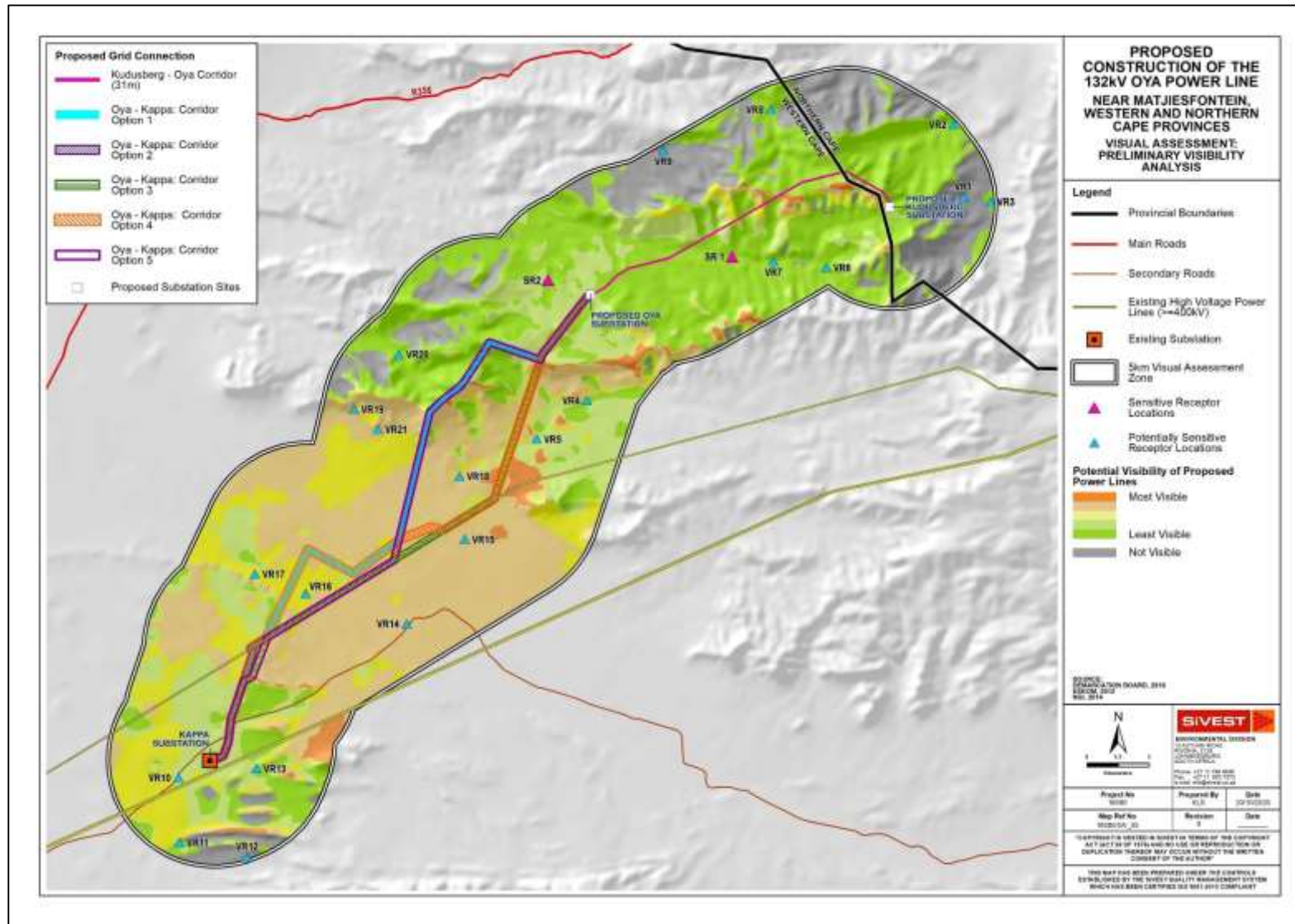


Figure 64: Preliminary visibility analysis of proposed development

Vegetation

Vegetation cover across the study area is predominantly short and sparse and thus will not provide any visual screening (**Figure 65**). In some instances however, taller trees have been planted around farmhouses, possibly restricting views from these receptor locations to some degree (**Figure 66**).



Figure 65: Short, sparse vegetation cover in the area does not provide any visual screening



Figure 66: Trees planted around a farmstead in the south-western sector of the study area

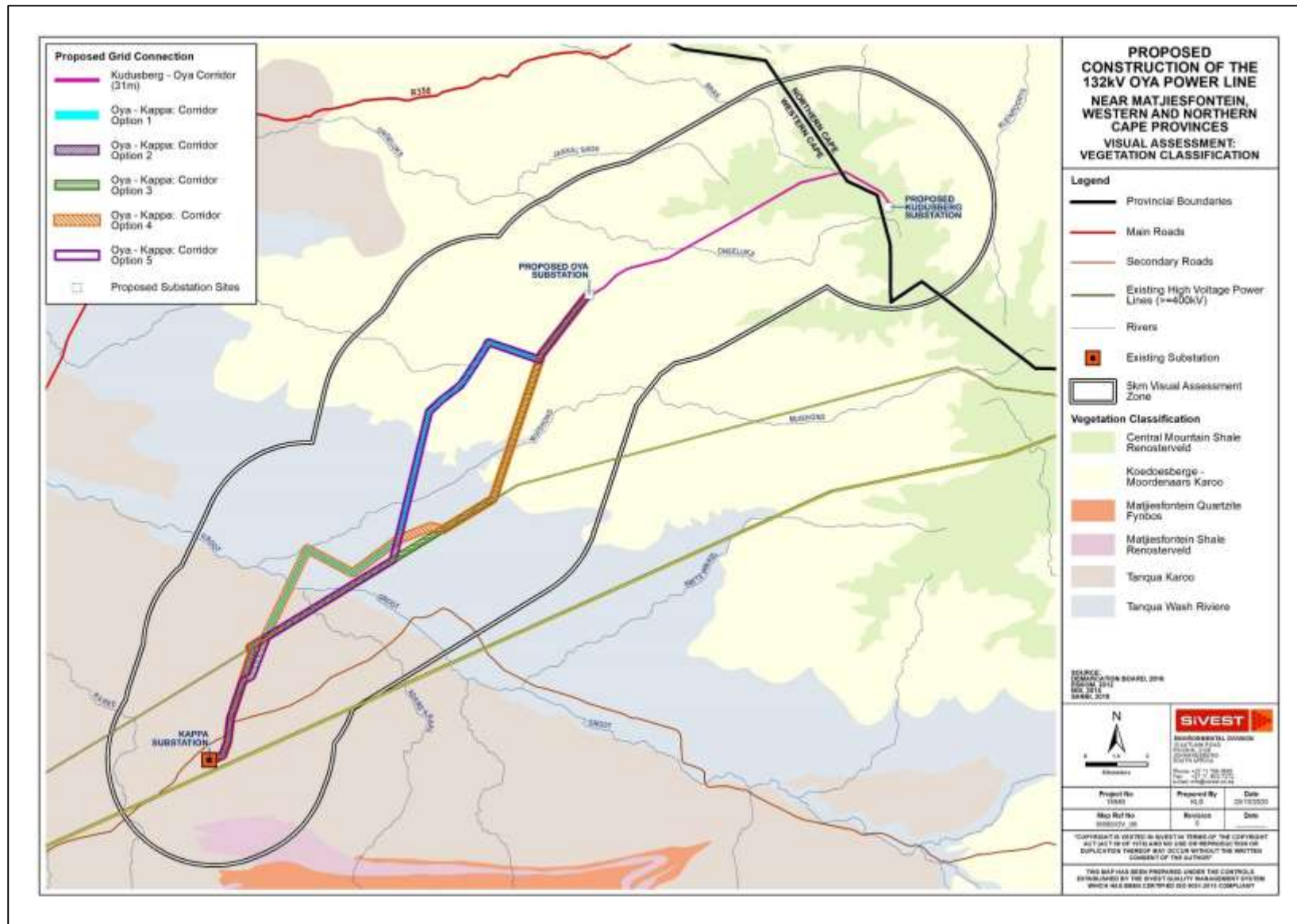


Figure 67: Vegetation Classification in the Study Area

Land Use

Sparse human habitation and the predominance of natural vegetation cover across much of the study area would give the viewer the general impression of a largely natural setting with some pastoral elements. In addition, there are no towns or settlements in the study area and thus, there are very low levels of human transformation and visual degradation across much of the study area.

Significant elements of human transformation are however present in the south-western sector of the study area, including high voltage power lines, Kappa Substation and the Perdekraal East Wind Farm. These elements are considered to have degraded the visual character to some degree.

The influence of the level of human transformation on the visual character of the area is described in more detail below.

6.13.2 Visual Character and Cultural Value

The above physical and land use-related characteristics of the study area contribute to its overall visual character. Visual character largely depends on the level of change or transformation from a natural baseline in which there is little evidence of human transformation of the landscape. Varying degrees of human transformation of a landscape would engender differing visual characteristics to that landscape, with a highly modified urban or industrial landscape being at the opposite end of the scale to a largely natural undisturbed landscape. Visual character is also influenced by the presence of built infrastructure such as buildings, roads and other objects such as telephone or electrical infrastructure. The visual character of an area largely determines the **sense of place** relevant to the area. This is the unique quality or character of a place, whether natural, rural or urban which results in a uniqueness, distinctiveness or strong identity.

As mentioned above, much of the study area is characterised by natural landscapes with some pastoral elements and low densities of human settlement. Livestock grazing is the dominant land use. These activities have not transformed the natural landscape to any significant degree and as such a large portion of the study area has retained its natural character and is dominated by largely natural, scenic views.

There are no towns or built-up areas in the study area influencing the overall visual character and thus there are very low levels of human transformation and visual degradation across much of the study area. Prominent anthropogenic elements in the study area however include a large electrical substation (Kappa), associated high voltage power lines and the recently constructed Perdekraal East wind farm. Other, less prominent elements present in the area include telephone poles, windmills, gravel access roads and farm boundary fences. The presence of this infrastructure is an important factor in this context, as the introduction of the proposed power line and substation infrastructure would result in less visual contrast where other anthropogenic elements are already present.

The construction of the Perdekraal East WEF is a significant factor in the visual character of the study area. WEFs and their associated infrastructure typically consist of very large structures which are highly visible. As such, this facility has significantly altered the visual character and baseline in the south-eastern sector of the study area, resulting in a more industrial-type visual character.

The scenic quality of the landscape is also an important factor contributing to the visual character of an area or the inherent sense of place. Visual appeal is often associated with unique natural features or distinct variations in landform. As such, the hilly / mountainous terrain which occurs in the north-eastern sector of the study area is considered to be an important feature that increases the scenic appeal and visual interest in the area.

The greater area surrounding the proposed development is an important component when assessing visual character. The area can be considered to be typical of a Karoo or “platteland” landscape that would characteristically be encountered across the high-lying dry western and central interior of South Africa. Much of South Africa’s dry Karoo interior consists of wide open, uninhabited spaces sparsely punctuated by scattered farmsteads and small towns. Over the last couple of decades an increasing number of tourism routes have been established in the Karoo and in a context of increasing urbanisation in South Africa’s major centres, the Karoo is being marketed as an undisturbed getaway. Examples of this may be found in the “Getaway Guide to Karoo, Namaqualand and Kalahari” (Moseley and Naude-Moseley, 2008).

The typical Karoo landscape can be considered a valuable ‘cultural landscape’ in the South African context. Although the cultural landscape concept is relatively new, it is becoming an increasingly important concept in terms of the preservation and management of rural and urban settings across the world (Breedlove, 2002).

The Karoo landscape, consisting of wide-open plains, and isolated relief, interspersed with isolated farmsteads, windmills and stock holding pens, is an important part of the cultural matrix of the South African environment. The Karoo farmstead is also a representation of how the harsh arid nature of the environment in this part of the country has shaped the predominant land use and economic activity practiced in the area, as well as the patterns of human habitation and interaction. The presence of small towns, such as Touws River and Matjiesfontein, engulfed by an otherwise rural, almost barren environment, form an integral part of the wider Karoo landscape. As such, the Karoo landscape as it exists today has value as a cultural landscape in the South African context.

In light of this, it is important to assess whether the introduction of a new power line and associated infrastructure into the study area would be a degrading factor in the context of the natural Karoo character of the landscape. Broadly speaking, visual impacts on the cultural landscape in the area around the proposed development would be reduced by the fact that the area is very remote and there are no significant tourism enterprises attracting visitors into the study area. In addition, the nearest major scenic routes (N1 and R355) are some considerable distance away and are not expected to experience any visual impacts from the proposed development.

Broadly speaking therefore, the cultural landscape in this area is considered to be of low significance. However, a detailed assessment of the potential impacts of the proposed power line and substation development on the cultural landscape has been included in the Heritage Impact Assessment being undertaken in respect of the proposed project.

6.13.3 Visual Sensitivity

Visual sensitivity can be defined as the inherent sensitivity of an area to potential visual impacts associated with a proposed development. It is based on the physical characteristics of the area (i.e. topography, landform and land cover), the spatial distribution of potential receptors, and the likely value judgements of these receptors towards a new development (Oberholzer, 2005). A viewer’s perception is usually based on the perceived aesthetic appeal of an area and on the presence of economic activities (such as recreational tourism) which may be based on this aesthetic appeal.

In order to assess the visual sensitivity of the area, SiVEST has developed a matrix based on the characteristics of the receiving environment which, according to the Guidelines for Involving Visual and Aesthetic Specialists in the EIA Processes, indicate that visibility and aesthetics are likely to be ‘key issues’ (Oberholzer, 2005).

Based on the criteria in the matrix (**Table 26**), the visual sensitivity of the area is broken up into a number of categories, as described below:

- i) **High** - The introduction of a new development such as a power line and/or substation would be likely to be perceived negatively by receptors in this area; it would be considered to be a visual intrusion and may elicit opposition from these receptors.
- ii) **Moderate** – Receptors are present, but due to the nature of the existing visual character of the area and likely value judgements of receptors, there would be limited negative perception towards the new development as a source of visual impact.
- iii) **Low** - The introduction of a new development would not be perceived to be negative, there would be little opposition or negative perception towards it.

The table below outlines the factors used to rate the visual sensitivity of the study area. The ratings are specific to the visual context of the receiving environment within the study area.

Table 26: Environmental factors used to define visual sensitivity of the study area

FACTORS	DESCRIPTION	RATING												
		LOW								HIGH				
		1	2	3	4	5	6	7	8	9	10			
Pristine / natural / scenic character of the environment	Study area is largely natural with areas of scenic value and some pastoral elements.													
Presence of sensitive visual receptors	Relatively few sensitive receptors have been identified in the study area.													
Aesthetic sense of place / visual character	Visual character is typical of Karoo Cultural landscape.													
Irreplaceability / uniqueness / scarcity value	Although there are areas of scenic value within the study area, these are not rated as highly unique.													
Cultural or symbolic meaning	Much of the area is typical of a Karoo Cultural landscape.													
Protected / conservation areas in the study area	No protected or conservation areas were identified in the study area.													
Sites of special interest present in the study area	No sites of special interest were identified in the study area.													
Economic dependency on scenic quality	Few tourism/leisure-based facilities in the area													
International / regional / local status of the environment	Study area is typical of Karoo landscapes													
**Scenic quality under threat / at risk of change	Introduction of grid connection infrastructure will alter the visual character and sense of place. In addition, the development of other renewable energy facilities in the broader area as planned or under construction will introduce an increasingly industrial character, giving rise to significant cumulative impacts													

Low			Moderate			High			
10	20	30	40	50	60	70	80	90	100

Based on the above factors, the total score for the study area is 44, which according to the scale above, would result in the area being rated as having a low to moderate visual sensitivity. It should be stressed however that the concept of visual sensitivity has been utilised indicatively to provide a broad-scale

indication of whether the landscape is likely to be sensitive to visual impacts, and is based on the physical characteristics of the study area, economic activities and land use that predominates. An important factor contributing to the visual sensitivity of an area is the presence, or absence of visual receptors that may value the aesthetic quality of the landscape and depend on it to produce revenue and create jobs.

No formal protected areas were identified in the study area and relatively few sensitive or potentially sensitive receptors were found to be present.

As part of the visual sensitivity assessment, a screening exercise was undertaken with the aim of indicating any areas that should be precluded from the proposed development footprint. From a visual perspective, these are areas where the establishment of power lines and/or substations would result in the greatest probability of visual impacts on sensitive or potentially sensitive visual receptors.

Using GIS-based visibility analysis, it was possible to determine which sectors of the application site would be visible to the highest numbers of receptors in the study area (**Figure 68**). This analysis considered all the sensitive and potentially sensitive receptor locations identified (Section 8.1 of the VIA Report). Due to the fact that there are relatively few receptors, widely scattered across the area, no sections of the proposed route alignments were found to be significantly more sensitive than any others. Accordingly, areas visible to more than 33% of the receptors were rated as areas of potentially 'high visual sensitivity'. However, as the study area as a whole is rated as having a low to moderate visual sensitivity, the sensitivity rating would be reduced to "Medium-High". Hence these areas are **not considered to be "no go areas"**, but rather should be viewed as zones where development would be least preferred.

It should be noted that the visibility analysis is based purely on topographic data available for the broader study area and does not take into account any localised topographic variations or any existing infrastructure and / or vegetation which may constrain views. In addition, the analysis does not consider differing perceptions of the viewer which would largely determine the degree of visual impact being experienced.

The visual sensitivity analysis should therefore be seen as a conceptual representation or a worst-case scenario which rates the visibility of the site in relation to potentially sensitive receptors.

In addition to the sensitivity ratings, a 500m exclusion zone has been delineated around the identified receptors in the study area. It is recommended that grid infrastructure should not be developed within these buffer zones so as to reduce visual impacts of the power line on these receptors.

These areas of visual sensitivity are shown in **Figure 68** below.

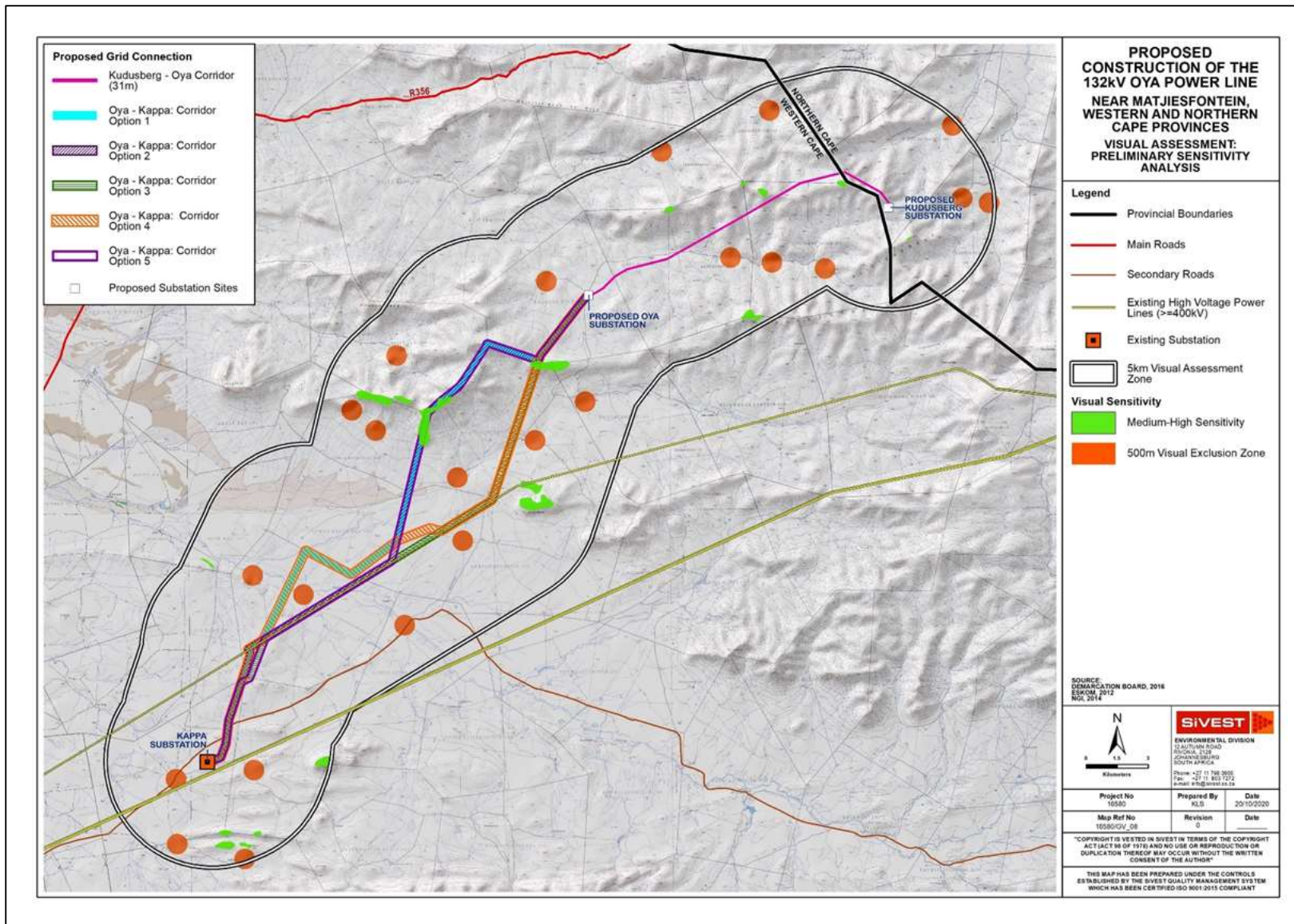


Figure 68: Preliminary visual sensitivity analysis of proposed development

In assessing visual sensitivity, the Landscape Theme of the National Environmental Screening Tool was used to determine the relative landscape sensitivity for the development of grid connection infrastructure. The tool does not however identify any landscape sensitivities in respect of the proposed power line or substation.

6.13.4 Visual Absorption Capacity

Visual absorption capacity is the ability of the landscape to absorb a new development without any significant change in the visual character and quality of the landscape. The level of absorption capacity is largely based on the physical characteristics of the landscape (topography and vegetation cover) and the level of transformation present in the landscape.

Although the undulating topography in the study would increase the visual absorption capacity, this would be offset by the lack of screening provided by the dominant shrubland vegetation. A significant portion of the study area has however already undergone significant transformation as a result of the Kappa substation and associated high voltage power lines and further transformation has occurred with the construction of the Perdekraal East Windfarm, thus increasing the visual absorption capacity of the landscape.

Visual absorption capacity in the study area is therefore rated as moderate.

6.13.5 Sensitive Visual Receptors

A sensitive visual receptor location is defined as a location from where receptors would potentially be impacted by a proposed development. Adverse impacts often arise where a new development is seen as an intrusion which alters the visual character of the area and affects the 'sense of place'. The degree of visual impact experienced will however vary from one receptor to another, as it is largely based on the viewer's perception.

A distinction must be made between a receptor location and a sensitive receptor location. A receptor location is a site from where the proposed development may be visible, but the receptor may not necessarily be adversely affected by any visual intrusion associated with the development. Less sensitive receptor locations include locations of commercial activities and certain movement corridors, such as roads that are not tourism routes. More sensitive receptor locations typically include sites that are likely to be adversely affected by the visual intrusion of the proposed development. They include tourism facilities, scenic sites and residential dwellings in natural settings.

The identification of sensitive receptors is typically based on a number of factors which include:

- the visual character of the area, especially taking into account visually scenic areas and areas of visual sensitivity;
- the presence of leisure-based (especially nature-based) tourism in an area;
- the presence of sites or routes that are valued for their scenic quality and sense of place;
- the presence of homesteads / farmsteads in a largely natural setting where the development may influence the typical character of their views; and
- feedback from interested and affected parties, as raised during the public participation process conducted as part of the BA study.

Viewing distance is also a critical factor in the experiencing of visual impacts. As the visibility of the development would diminish exponentially over distance (refer to **section 5.4** of VIA Report), receptor

locations which are closer to the proposed development would experience greater adverse visual impacts than those located further away.

The degree of visual impact experienced will however vary from one (1) inhabitant to another, as it is largely based on the viewer's perception. Factors influencing the degree of visual impact experienced by the viewer include the following:

- Value placed by the viewer on the natural scenic characteristics of the area.
- The viewer's sentiments toward the proposed structures. These may be positive (a symbol of progression toward a less polluted future) or negative (foreign objects degrading the natural landscape).
- Degree to which the viewer will accept a change in the typical Karoo character of the surrounding area.

Receptor Identification

Preliminary desktop assessment of the study area identified twenty-three (23) potentially sensitive visual receptor locations within the study area, most of which appear to be existing farmsteads (**Figure 69**). These farmsteads are regarded as potentially sensitive visual receptors as they are located within a mostly rural setting and the proposed development will likely alter natural vistas experienced from these locations, although the residents' sentiments toward the proposed development are unknown.

The findings of the desktop assessment were largely confirmed by field assessments conducted in the study area for other VIAs, although it was not possible to confirm the presence of farmsteads at all the identified locations due to access restrictions. Notwithstanding this limitation, all the identified receptor locations were assessed as part of this VIA as they are still regarded as being potentially sensitive to the visual impacts associated with the proposed.

Two (2) of the identified receptor locations were confirmed to be sensitive receptors, these being tourism / accommodation facilities at the Gats Rivier Holiday Farm and Baakens Rivier. It was established that Baakens River comprises accommodation facilities that are part of the Gats Rivier Holiday Farm facility, even though these facilities are located on a different farm located some distance from the main Gats Rivier farm.

Five (5) identified receptors were found to be outside the viewshed for the combined grid infrastructure proposals.

In many cases, roads along which people travel, are regarded as sensitive receptors. The primary thoroughfare in the broader region is the R356 main road which connects the R46 near Ceres with Loxton by way of Sutherland and Fraserburg. This is a gravel road, primarily used as an access route by the local farmers and is not valued or utilised for its scenic or tourism potential. As a result, this road is not considered to be visually sensitive. In addition, the road is more than 8kms from the nearest power line route alternative and well outside the 5km visual assessment area. At this distance, motorists travelling along this road are not expected to experience any adverse visual impacts as a result of the proposed development.

The DR1475 is the primary thoroughfare in the south-western sector of the study area. This gravel road is used mainly as an access route by the local farmers and is therefore not valued or utilised for its scenic or tourism potential. As a result, this road is not considered to be visually sensitive.

Other roads in the study area are primarily farm access roads and do not form part of any scenic tourist routes and are therefore not regarded as visually sensitive.

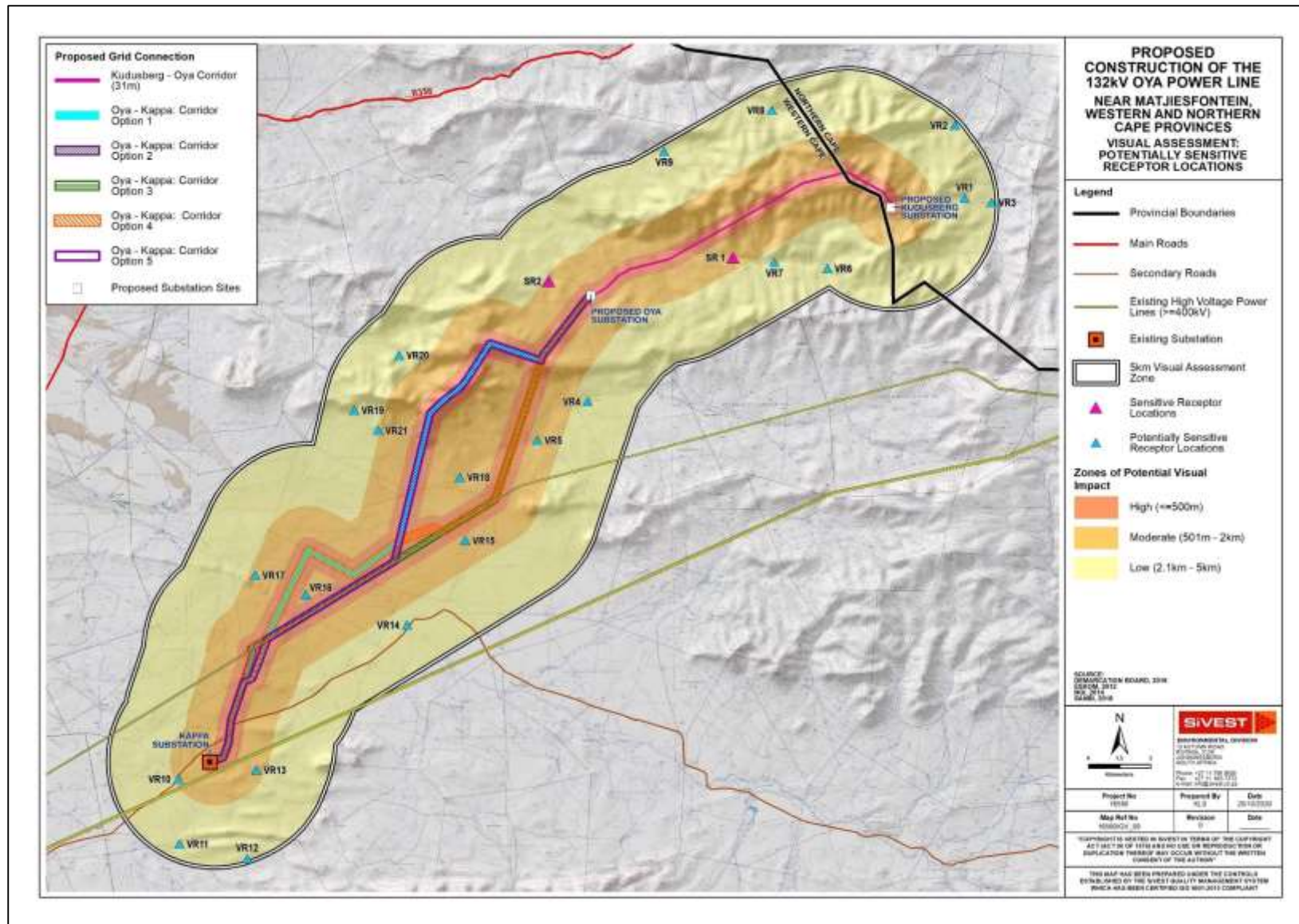


Figure 69: Potentially sensitive receptor locations within 5km of the proposed development

Receptor Impact Rating

In order to assess the impact of the proposed grid infrastructure development on the identified potentially sensitive receptor locations, a matrix that takes into account a number of factors has been developed and is applied to each receptor location.

The matrix is based on a number of factors as listed below:

- Distance of a receptor location away from the proposed development (zones of visual impact)
- Presence of screening elements (topography, vegetation etc.)
- Visual contrast of the development with the landscape pattern and form

These factors are considered to be the most important factors when assessing the visual impact of a proposed development on a potentially sensitive receptor location in this context. It should be noted that this rating matrix is a relatively simplified way of assigning a likely representative visual impact, which allows a number of factors to be considered. Experiencing visual impacts is however a complex and qualitative phenomenon and is thus difficult to quantify accurately. The matrix should therefore be seen as a representation of the likely visual impact at a receptor location. Part of its limitation lies in the quantitative assessment of what is largely a qualitative or subjective impact.

As described above, the distance of the viewer / receptor location from the development is an important factor in the context of experiencing visual impacts which will have a strong bearing on mitigating the potential visual impact. A high impact rating has been assigned to receptor locations that are located within 500m of the proposed development. Beyond 5km, the visual impact of a power line and/or substation diminishes considerably, as the development would appear to merge with the elements on the horizon. Any visual receptor locations beyond this distance have therefore not been assessed as they fall outside the study area and would not be visually influenced by the proposed development.

Zones of visual impact for the proposed development were therefore delineated according to distance from the proposed power line assessment corridors. Based on the height and project, the distance intervals chosen for the zones of visual impact are as follows:

- 0 - 500m (high impact zone)
- 500m – 2km (moderate impact zone)
- 2km - 5km (low impact zone)

The presence of screening elements is an equally important factor in this context. Screening elements can be vegetation, buildings and topographic features. For example, a grove of trees or a series of low hills located between a receptor location and an object could completely shield the object from the receptor. As such, where views of the proposed development are completely screened, or where the receptor is outside the viewshed for the proposed development, the receptor has been assigned an overriding nil impact rating, as the development would not impose any impact on the receptor.

The visual contrast of a development refers to the degree to which the development would be congruent with the surrounding environment. This is based on whether or not the development would conform to the land use, settlement density, structural scale, form and pattern of natural elements that define the structure of the surrounding landscape. Visual compatibility is an important factor to be considered when assessing the impact of the development on receptors within a specific context. A development that is incongruent with the surrounding area could have a significant visual impact on sensitive receptors as it may change the visual character of the landscape.

In light of the fact that the study area is located within the Central Strategic Transmission Corridor, and also within the Komsberg REDZ, the concentration of renewable energy developments and associated grid connection infrastructure is supported in this area. This could result in an incremental change in

the visual character of the area and in the typical land use patterns towards a less rural environment within which power lines and substations would be less incongruous.

The matrix returns a score which in turn determines the visual impact rating assigned to each receptor location (**Table 27**) below.

Table 27: Rating scores

Rating	Overall Score
High Visual Impact	8-9
Moderate Visual Impact	5-7
Low Visual Impact	3-4
Negligible Visual Impact	(overriding factor)

An explanation of the matrix is provided in **Table 28** below.

Table 28: Visual assessment matrix used to rate the impact of the proposed development on potentially sensitive receptors

VISUAL FACTOR	VISUAL IMPACT RATING			
	HIGH	MODERATE	LOW	<u>OVERRIDING FACTOR:</u> NEGLIGIBLE
Distance of receptor away from proposed development	<= 500m Score 3	500m < 2km Score 2	2km < 5km Score 1	>5km
Presence of screening factors	No / almost no screening factors – development highly visible Score 3	Screening factors partially obscure the development Score 2	Screening factors obscure most of the development Score 1	Screening factors completely block any views towards the development, i.e. the development is not within the viewshed
Visual Contrast	High contrast with the pattern and form of the natural landscape elements (vegetation and land form), typical land use and/or human elements (infrastructural form) Score 3	Moderate contrast with the pattern and form of the natural landscape elements (vegetation and land form), typical land use and/or human elements (infrastructural form) Score 2	Corresponds with the pattern and form of the natural landscape elements (vegetation and land form), typical land use and/or human elements (infrastructural form) Score 1	

Table 29 below presents a summary of the overall visual impact of the proposed 132kV power line and substations on each of the potentially sensitive visual receptor locations identified within 5km of the proposed development.

Table 29: Summary Receptor Impact Rating

Receptor Number	Distance to nearest	Screening	Contrast	overall Impact Rating
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	Corridor Alternative				
SR1 – Baakens Rivier ¹	Mod (2)	1.4km	High (3)	High (3)	HIGH (8)
SR2 – Gats Rivier ²	Mod (2)	1.8km	Mod (2)	Mod (2)	MODERATE (5)
VR 1 – Farmstead ³	Low (1)	3.4km	NIL		
VR 2 – Farmstead	Low (1)	4.7km	Mod (2)	High (3)	MODERATE (6)
VR 3 – Farmstead	Low (1)	4.7km	Mod (2)	High (3)	MODERATE (6)
VR 4 – Farmstead	Low (1)	2.6km	Mod (2)	High (3)	MODERATE (6)
VR 5 – Farmstead	Mod (2)	0.9km	Mod (2)	High (3)	MODERATE (7)
VR 6 – Farmstead	Low (1)	4.2km	Mod (2)	High (3)	MODERATE (6)
VR 7 – Farmstead ³	Low (1)	2.6km	NIL		
VR 8 – Farmstead	Low (1)	3.8km	Mod (2)	High (3)	MODERATE (6)
VR 9 – Farmstead ³	Low (1)	4.6km	Nil		
VR 10 – Farmstead	Mod (2)	1.8km	Mod (2)	Mod (2)	MODERATE (5)
VR 11 – Farmstead ³	Low (1)	4.2km	NIL		
VR 12 – Farmstead ³	Low (1)	4.8km	NIL		
VR 13 – Farmstead	Mod (2)	1.6km	Mod (2)	High (3)	MODERATE (7)
VR 14 – Farmstead	Low (1)	2.8km	Mod (2)	Low (1)	LOW
VR 15 – Farmstead	Mod (2)	0.8km	Mod (2)	High (3)	MODERATE (6)
VR 16 – Farmstead	Mod (2)	0.7km	Mod (2)	Low (1)	MODERATE (5)
VR 17 – Farmstead	Mod (2)	1.6km	Mod (2)	High (3)	MODERATE (7)
VR 18 – Farmstead	Mod (2)	1.7km	Mod (2)	Mod (2)	MODERATE (6)
VR 19 – Farmstead	Low (1)	3.4km	High (3)	High (3)	MODERATE (7)
VR 20 – Farmstead	Low (1)	2.8km	Mod (2)	High (3)	MODERATE (6)
VR 21 – Farmstead	Low (1)	2.1km	Mod (2)	High (3)	MODERATE (6)

¹Baakens Rivier is located within the proposed Kudusberg WEF development area. It is known that the occupants have a vested interest in the proposed WEF and associated infrastructure development and would therefore not perceive the proposed power line in a negative light.

²Gats Rivier is located within the proposed Oya Energy Facility development area. It is known that the occupants have a vested interest in the proposed energy facility and associated infrastructure development and would therefore not perceive the proposed power line in a negative light.

³Receptor is outside the preliminary viewshed and as such the overall impact rating is “NIL”

The table above shows that one (1) of the sensitive receptors would experience high levels of visual impact as a result of the proposed development, this being the farmstead on Baakens Rivier. As previously mentioned, this property forms part of the Kudusberg WEF application site, and as such the owner has a vested interest in the development of the facility and the associated grid connection infrastructure. The other sensitive receptor, Gats Rivier Holiday Farm, will be subjected to moderate levels of visual impact, and as the property is under the same ownership as Baakens Rivier, it is unlikely that the owners will perceive the proposed development in a negative light.

Fifteen (15) potentially sensitive receptors, will be subjected to moderate levels of visual impact as a result of the proposed power line development, while one receptor will be subjected to low levels of visual impact. The remaining five (5) receptors are outside the viewshed of the proposed development and are therefore not expected to be subjected to any visual impacts as a result of the power line development.

7 ENVIRONMENTAL IMPACT ASSESSMENT

7.1 Methodology for Assessing Impacts

The EIA Methodology assists in evaluating the overall effect of a proposed activity on the environment while allowing for comparison between different impacts based on the same criteria. Determining the significance of an environmental impact on an environmental parameter is determined through a systematic analysis of the various components of the impact.

7.1.1 Determination of Significance of Impacts

Significance is determined through a synthesis of impact characteristics which include context and intensity of an impact. Context refers to the geographical scale (i.e. site, local, national or global), whereas intensity is defined by the severity of the impact e.g. the magnitude of deviation from background conditions, the size of the area affected, the duration of the impact and the overall probability of occurrence. Significance is calculated as shown in **Table 30** below.

Significance is an indication of the importance of the impact in terms of both physical extent and time scale, and therefore indicates the level of mitigation required. The total number of points scored for each impact indicates the level of significance of the impact.

7.1.2 Impact Rating System

The impact assessment must take account of the nature, scale and duration of effects on the environment and whether such effects are positive (beneficial) or negative (detrimental). Each issue / impact is also assessed according to the various project stages, as follows:

- Planning or pre-construction;
- Construction;
- Operation; and
- Decommissioning.

Where necessary, the proposal for mitigation or optimisation of an impact should be detailed. A brief discussion of the impact and the rationale behind the assessment of its significance has also been included.

The significance of Cumulative Impacts has also been rated as reported in **section 7.5**.

7.1.2.1 Rating System Used to Classify Impacts

SiVEST developed a uniform rating system to enable comparison between impacts. The rating system is applied to the potential impact on the receiving environment and includes an objective evaluation of the possible mitigation of the impact. Impacts have been consolidated into one (1) rating. In assessing the significance of each issue, the following criteria (including an allocated point system) is used:

Table 30: Rating of Impacts Criteria

ENVIRONMENTAL PARAMETER		
A brief description of the environmental aspect likely to be affected by the proposed activity (e.g. Surface Water).		
ISSUE / IMPACT / ENVIRONMENTAL EFFECT / NATURE		
Include a brief description of the impact of environmental parameter being assessed in the context of the project. This criterion includes a brief written statement of the environmental aspect being impacted upon by a particular action or activity (e.g. oil spill in surface water feature).		
EXTENT (E)		
This is defined as the area over which the impact will be expressed. Typically, the severity and significance of an impact have different scales and as such bracketing ranges are often required. This is often useful during the detailed assessment of a project in terms of further defining the determined.		
1	Site	The impact will only affect the site
2	Local/district	Will affect the local area or district
3	Province/region	Will affect the entire province or region
4	International and National	Will affect the entire country
PROBABILITY (P)		
This describes the chance of occurrence of an impact		
1	Unlikely	The chance of the impact occurring is extremely low (Less than a 25% chance of occurrence).
2	Possible	The impact may occur (Between a 25% to 50% chance of occurrence).
3	Probable	The impact will likely occur (Between a 50% to 75% chance of occurrence).
4	Definite	Impact will certainly occur (Greater than a 75% chance of occurrence).
REVERSIBILITY (R)		
This describes the degree to which an impact on an environmental parameter can be successfully reversed upon completion of the proposed activity.		
1	Completely reversible	The impact is reversible with implementation of minor mitigation measures
2	Partly reversible	The impact is partly reversible but more intense mitigation measures are required.
3	Barely reversible	The impact is unlikely to be reversed even with intense mitigation measures.
4	Irreversible	The impact is irreversible, and no mitigation measures exist.
IRREPLACEABLE LOSS OF RESOURCES (L)		
This describes the degree to which resources will be irreplaceably lost as a result of a proposed activity.		
1	No loss of resource.	The impact will not result in the loss of any resources.
2	Marginal loss of resource	The impact will result in marginal loss of resources.
3	Significant loss of resources	The impact will result in significant loss of resources.
4	Complete loss of resources	The impact is result in a complete loss of all resources.
DURATION (D)		
This describes the duration of the impacts on the environmental parameter. Duration indicates the lifetime of the impact as a result of the proposed activity.		
1	Short term	The impact and its effects will either disappear with mitigation or will be mitigated through natural process in a span shorter than the construction phase (0 – 1 years), or the impact and its effects will last for the period of a relatively short construction period and a limited recovery time after construction, thereafter it will be entirely negated (0 – 2 years).

2	Medium term	The impact and its effects will continue or last for some time after the construction phase but will be mitigated by direct human action or by natural processes thereafter (2 – 10 years).
3	Long term	The impact and its effects will continue or last for the entire operational life of the development but will be mitigated by direct human action or by natural processes thereafter (10 – 50 years).
4	Permanent	The only class of impact that will be non-transitory. Mitigation either by man or natural process will not occur in such a way or such a time span that the impact can be considered transient (Indefinite).
INTENSITY / MAGNITUDE (I / M)		
Describes the severity of an impact (i.e. whether the impact has the ability to alter the functionality or quality of a system permanently or temporarily).		
1	Low	Impact affects the quality, use and integrity of the system/component in a way that is barely perceptible.
2	Medium	Impact alters the quality, use and integrity of the system / component but system / component still continues to function in a moderately modified way and maintains general integrity (some impact on integrity).
3	High	Impact affects the continued viability of the system / component and the quality, use, integrity and functionality of the system or component is severely impaired and may temporarily cease. High costs of rehabilitation and remediation.
4	Very high	Impact affects the continued viability of the system / component and the quality, use, integrity and functionality of the system or component permanently ceases and is irreversibly impaired (system collapse). Rehabilitation and remediation often impossible. If possible, rehabilitation and remediation often unfeasible due to extremely high costs of rehabilitation and remediation.
SIGNIFICANCE (S)		
Significance is determined through a synthesis of impact characteristics. Significance is an indication of the importance of the impact in terms of both physical extent and time scale, and therefore indicates the level of mitigation required. This describes the significance of the impact on the environmental parameter. The calculation of the significance of an impact uses the following formula:		
Significance = (Extent + probability + reversibility + irreplaceability + duration) x magnitude/intensity.		
The summation of the different criteria will produce a non-weighted value. By multiplying this value with the magnitude/intensity, the resultant value acquires a weighted characteristic which can be measured and assigned a significance rating.		
Points	Impact Significance Rating	Description
5 to 23	Negative Low impact	The anticipated impact will have negligible negative effects and will require little to no mitigation.
5 to 23	Positive Low impact	The anticipated impact will have minor positive effects.
24 to 42	Negative Medium impact	The anticipated impact will have moderate negative effects and will require moderate mitigation measures.
24 to 42	Positive Medium impact	The anticipated impact will have moderate positive effects.

43 to 61	Negative High impact	The anticipated impact will have significant effects and will require significant mitigation measures to achieve an acceptable level of impact.
43 to 61	Positive High impact	The anticipated impact will have significant positive effects.
62 to 80	Negative Very high impact	The anticipated impact will have highly significant effects and are unlikely to be able to be mitigated adequately. These impacts could be considered "fatal flaws".
62 to 80	Positive Very high impact	The anticipated impact will have highly significant positive effects.

SiVEST's Impact Rating Methodology which was used to assess the potential impacts is set-out in detail in **Appendix 9C**.

7.2 Environmental Impact Assessment

Specialist studies have been conducted in terms of the stipulations contained within Appendix 6 of the EIA Regulations, 2014 (as amended). In addition, the relevant specialist Protocols as published in Government Notice No. 648 of 20 March 2020 were also followed, where required (<https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols>).

As previously mentioned, the following specialist assessments were conducted prior to and during the BA process in order to identify and assess the issues associated with the proposed development:

- Terrestrial Ecology Impact Assessment³¹;
- Desktop-Agriculture and soils Compliance statement³²;
- Surface Water Impact Assessment³³;
- Avifauna Impact Assessment;
- Heritage Impact Assessment, inclusive of:
 - Palaeontology,
 - Archaeology; and
 - Cultural Landscape.
- Desktop Socio-Economic Impact Assessment; and
- Visual Impact Assessment.

These above-mentioned specialist assessments have been undertaken to identify and assess issues. These assessments were also undertaken to inform the impact assessment of the proposed development. It should be noted that the specialists assessed the proposed substation sites and power line corridors (including alternatives) as part of their respective assessments and also focused on specific impacts of the proposed development area and power line and substation infrastructure in detail.

The identified impacts are elaborated on in the sub-sections below.

³¹ Protocol for the assessment and reporting of environmental impacts on Terrestrial biodiversity gazetted on 20 March 2020 (Sections 24(5)(A) and (H) and 44 of NEMA, 1998)

³² Protocol for the specialist assessment and minimum report content requirements of environmental impacts on agricultural resources by onshore wind and/or solar photovoltaic energy generation facilities where the electricity output is 20 megawatts or more, gazetted on 20 March 2020 (Sections 24(5)(A) and (H) and 44 of NEMA, 1998)

³³ Protocol for the assessment and reporting of environmental impacts on aquatic biodiversity gazetted on 20 March 2020 (Sections 24(5)(A) and (H) and 44 of NEMA, 1998)

7.2.1 Terrestrial Ecological Impacts

The Terrestrial Ecology Impact Assessment was conducted by Dr David Hoare (David Hoare Consulting) and is included as **Appendix 6F**.

A summary of the potential ecological issues for the study area is as follows (issues assessed by other specialists, e.g. on wetlands, are not included here):

- Presence of natural vegetation on site, some of which has high conservation value due to being within Critical Biodiversity Areas.
- Potential presence of a number of protected plant species. A permit from the relevant Provincial authorities will be required for any protected species lost to the development.
- Potential presence of the following animals of conservation concern:
 - *Panthera pardus* (Leopard) Vulnerable, protected
 - *Graphiurus ocellatus* (Spectacled Dormouse) Near Threatened
 - *Pelea capreolus* (Grey Rhebok) Near Threatened
 - *Mellivora capensis* (Honey Badger) Protected
 - *Felis nigripes* (Black-footed Cat) Vulnerable
 - *Chersobius boulengeri* (Karoo Dwarf Tortoise) Near Threatened
 - *Ouroborus cataphractus* (Armadillo Girdled Lizard) Protected
- Potential invasion of natural habitats by alien invasive plants, thus causing additional impacts on biodiversity features. Alien invasive plants are required by law to be controlled.
- Presence of habitats associated with riparian habitats, drainage lines and dry stream beds. These are linear habitats that are important for various species for shelter, movement and resources, and for which impacts could potentially cause fragmentation and/or a disconnect between different parts of the system.
- Presence of rocky areas that tend to contain species restricted to such habitats.
- Succulent karoo vegetation has a structure and composition that has developed over millenia. Any loss of habitat is effectively permanent in that it is not possible in human lifespans to recover any habitat lost to disturbance. Vegetation recovery after disturbance is to a composition that can be observed on old lands and differs substantially from the typical natural vegetation. Any unnecessary destruction of habitat must therefore be avoided.

Based on this information, habitats on site were placed into different sensitivity classes, namely HIGH for wetlands, floodplains and riparian habitats, MEDIUM-HIGH for drainage areas and rock outcrops, and MEDIUM for mid-slopes and plains vegetation. The areas of HIGH sensitivity should be avoided, if possible, or impacts on these areas minimised as much as possible.

7.2.1.1 Design phase / pre-construction impacts

The Planning / Pre construction Phase includes any activities associated with planning of the project. This does not involve any physical disturbance of the landscape. There are therefore no impacts on biodiversity / ecology that are relevant to this phase. Nevertheless, measures taken during the Design Phase of the project can potentially have a significant effect on the nature, extent and intensity of impacts experienced during the Construction Phase.

7.2.1.2 Construction Phase Impacts

Direct impacts include the following:

- *Loss and/or fragmentation of indigenous natural vegetation due to clearing for construction*

The regional vegetation types in the broad study area are classified in the scientific literature as Least Threatened (Mucina *et al.*, 2008) and not listed in the National List of Ecosystems that are Threatened and need of protection (GN1002 of 2011). Any areas of natural habitat within this regional vegetation type are therefore considered to have moderate conservation value. Some infrastructure is located within Critical Biodiversity Areas for the Western Cape, but the effect of this is assessed separately.

Vegetation on site is within a very arid region and consists of slow-growing dwarf shrubs, many of which are partially succulent. These species are slow to grow, and individuals are much older than they appear from their size. Disturbed areas are not likely to recover to any natural state and clearing must therefore be kept to an absolute minimum to avoid habitat degradation issues.

Habitat loss refers to physical disturbance of habitats through clearing, grading and other permanent to semi-permanent loss or degradation. Loss of habitat on site could lead to loss of biodiversity as well as habitat important for the survival of populations of various species. Habitat fragmentation will occur primarily through the construction of access roads. Edge effects related to roads are difficult to quantify or predict, but anything within 50 m of a road is almost certain to be affected by the changed physical conditions.

All infrastructure components will require clearing of vegetation prior to construction. The substations and access roads will require vegetation clearing, as well as each of the powerline tower structures. For all infrastructure components, loss of habitat will occur, but this will be relatively insignificant in comparison to the total area of the vegetation types concerned.

- *Loss of individuals of listed or protected plant species*

Plant species are especially vulnerable to infrastructure development due to the fact that they cannot move out of the path of the construction activities but are also affected by overall loss of habitat within which metapopulation dynamics occur (dispersal, recruitment, pollination, etc.).

There is one (1) species protected according to the National Environmental Management: Biodiversity Act, *Hoodia gordonii*, that could potentially occur on site. There are a number of species protected according to Provincial legislation. These are listed in a section above in this report.

- *Loss of faunal habitat and refugia*

Construction activities will lead to direct loss of habitat favourable for various faunal species, including sites where mobile fauna would obtain refuge and sedentary fauna would have permanent homes. The total loss of habitat will be a relatively small proportion of the available habitat on site. Loss of habitat could potentially affect all animal species occurring on site, although threatened and protected species are of greater concern. There are two (2) animal species of particular concern for this project, namely the Karoo Dwarf Tortoise and the Armadillo Girdled Lizard, neither of which were seen on site, although they have been assessed as having a probability of occurring there. There are also other more mobile species that are protected by legislation, including the Honey Badger, Black-footed Cat, Leopard and Cape Fox.

- *Direct mortality of fauna due to machinery, construction and increased traffic*

There is a possibility that animals will be killed by machinery during construction, especially sedentary or relatively sedentary species, and those that move too slowly to move out of the path of construction. This will inevitably lead to mortality of individuals of such animals. There is also a possibility of collisions

with vehicles due to increased traffic along roads and within the project area. Faunal mortalities may also be caused by electric fences, ingestion of waste material and/or accidental ensnarement.

- *Displacement of mobile terrestrial fauna*

Construction activities, loss of habitat, noise, dust and general activity associated with the construction phase of the project are likely to cause all mobile species to move away from the site. Mobile species of conservation concern that could potentially be affected by the proposed project are as follows:

- Honey Badger,
- Black-footed Cat,
- Leopard,
- Cape Fox, and
- Grey Rhebok.

All these species are mobile terrestrial species with a large home range and the ability to travel long distances in short periods of time. Individuals may be locally displaced, but this will have little effect on the overall range of the species nor is it expected that any overall impacts will result from local displacement.

- *Effects on physiological functioning of vegetation due to dust deposition*

There is a high probability during construction that dust will be created that will settle on surrounding vegetation. This will be due to earth-moving equipment as well as vehicles moving around on site as well as into and out of the site. There will be a definite increase in the amount of traffic on access roads to the site that will also affect surrounding areas. Dust deposited on vegetation directly screens incoming radiation as well as affects stomatal gas-exchange. The combined effect is a reduction in fitness of affected vegetation which will lead to reduced potential growth rates, damage to leaves, and possibly reduced ability to resist pathogens. In addition to direct effects on the vegetation, there is also a possibility that grazing animals will be affected through a reduction in palatability of plants, and increased silica on surfaces of edible plants that will possibly affect dental wear-and-tear.

- *Impact on integrity of Critical Biodiversity Areas*

Some parts of the site are included in Critical Biodiversity Areas for the Western Cape. There are CBA1 areas that are within the direct footprint of the proposed project. There are also extensive areas of Ecological Support Areas, in the form of drainage lines, that could potentially be affected directly by proposed infrastructure, depending on detailed layout plans and layout options.

All infrastructure components will require clearing of vegetation prior to construction. However, the access roads and substations will cause local permanent loss of vegetation, although not of significant extent in comparison to the entire extent of affected regional vegetation.

Indirect impacts include the following:

- *Increased poaching and/or illegal collecting due to increased access to the area*

The site is in a relatively remote area with moderately low access to the public. More importantly, access to mountainous areas is limited due to it being on private land. There is therefore a relatively low risk of opportunistic or targeted poaching of plants or animals. The construction of roads into the project area and the increased amount of traffic from outside areas will increase the opportunity for poaching or illegal collecting. From a botanical perspective, there are a number of plants in succulent or geophyte groups that are attractive to collectors. There are also animals, such as lizards and tortoises that may

be attractive to collectors or vulnerable to opportunistic collection. Many of these groups are protected under national and/or provincial legislation, but this does not necessarily prevent ill-informed or determined collectors. Poaching of animals or plants for meat or medicinal purposes is a separate risk that is also more likely to occur where physical access is created.

- *Establishment and spread of declared weeds and alien invader plants due to the clearing and disturbance of indigenous vegetation*

Major factors contributing to invasion by alien invader plants includes inter alia high disturbance (such as clearing for construction activities) and negative grazing practices (Zachariades et al. 2005). Exotic species are often more prominent near infrastructural disturbances than further away (Gelbard & Belnap 2003, Watkins *et al.*, 2003). Consequences of this may include:

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

No existing populations of alien plants were seen on site, but areas of farm infrastructure were not investigated during the field survey. There is a high possibility that alien plants could be introduced to areas within the footprint of the proposed activities from surrounding areas in the absence of control measures. The potential consequences may be of moderate seriousness for affected natural habitats. Control measures could prevent the impact from occurring. These control measures are relatively standard and well-known.

- *Changes to behavioural patterns of animals, including possible migration away or towards the project area*

The increased human presence and/or construction operations will increase noise levels as well as light levels at night. The increased human presence, elevated noise and light levels, loss of animal habitat and compaction of soils may alter the behavioural patterns of some animals. Some of these changes may favour certain species and negatively affect others and consequently change the composition of the animal communities. Some of these changes could possibly increase levels of predation. Territorial species such as steenbok, grey duiker and klipspringer will be negatively affected as well as species that live or move in the soil. These species might undergo a local reduction in their population size.

- *Increased runoff and erosion due to clearing of vegetation, construction of hard surfaces and compaction of surfaces, leading to changes in downslope areas*

Increased erosion (water and wind) and water run-off will be caused by the clearing of indigenous vegetation, creation of new hard surfaces and compaction of soil. Service roads will be the main source of disturbance and erosion if not properly constructed and provided with water run-off structures. The construction site, substation site and crane pads will furthermore be levelled and compacted causing additional run-off and erosion. Increased run-off and erosion could affect hydrological processes in the area and will change water and silt discharge into drainage lines and streams.

7.2.1.3 Operational Phase Impacts

Direct impacts include the following:

- *Continued disturbance to natural habitats due to general operational activities and maintenance*

During the operational phase of the project, there will be continuous activity on site, including normal operational activities, maintenance and monitoring. There may also be minor additional construction. Rehabilitation of various sites will also take place. These activities all have the potential to cause additional direct and/or indirect damage to natural habitat and vegetation.

- *Direct mortality of fauna through traffic, illegal collecting, poaching and collisions and/or entanglement with infrastructure*

There are various animal species of particular concern for this project, including the Karoo Dwarf Tortoise and the Armadillo Girdled Lizard. There are also other more mobile species that are protected by legislation, including the Honey Badger, Black-footed Cat, Leopard and Cape Fox. It is possible that individuals of these species may suffer mortality or removal of individuals through road kills, encounters with infrastructure, illegal hunting, illegal collecting (especially for the tortoise and lizard) and possible damage to habitats.

- *Continued runoff and erosion due to the presence of hard surfaces that change the infiltration and runoff properties of the landscape*

Increased erosion (water and wind) and water run-off will be caused by the clearing of indigenous vegetation, creation of new hard surfaces and compaction of soil. The internal access roads will be the main source of disturbance and erosion if not properly constructed and provided with water run-off structures. The construction site, substation site and crane pads will furthermore be levelled and compacted causing additional run-off and erosion. Increased run-off and erosion could affect hydrological processes in the area and will change water and silt discharge into drainage lines and streams.

Indirect Impacts include the following:

- *Continued establishment and spread of alien invasive plant species due to the presence of migration corridors and disturbance vectors*

The presence of disturbed surfaces on site creates ecological edges and corridors along which alien species can travel and become established.

- *Changes to behavioural patterns of animals, including possible migration away or towards the project area*

The increased human presence and/or construction operations will increase noise levels as well as light levels at night. The increased human presence, elevated noise and light levels, loss of animal habitat and compaction of soils may alter the behavioural patterns of some animals. Some of these changes may favour certain species and negatively affect others and consequently change the composition of the animal communities. Some of these changes could possibly increase levels of predation. Territorial species such as steenbok, grey duiker and klipspringer will be negatively affected as well as species that live or move in the soil. These species might undergo a local reduction in their population size.

7.2.1.4 Decommissioning Phase Impacts

It is expected that the project will operate for a minimum of twenty to twenty-five years (a typical planned life-span for a project of this nature). Decommissioning will probably require a series of steps resulting in the removal of equipment from the site and rehabilitation of footprint areas. It is possible that the site could be returned to a rural nature, but it is unlikely that natural vegetation would become established at disturbed locations on site for a very long time thereafter. The reality is that it is not possible to determine at this stage whether rehabilitation measures will be implemented or not or what the future plans for the site would be nor is it possible at this stage to determine what surrounding land pressures would be. These uncertainties make it difficult to undertake any assessment to determine possible impacts of decommissioning. It is recommended that a closure and rehabilitation plan be compiled near to the stage but in advance of when decommissioning is planned, and that this would be required to be implemented prior to closure of the project. Possible impacts are described below.

Direct impacts include the following:

- *Loss and disturbance of natural vegetation due to the removal of infrastructure and need for working sites*

During the decommissioning phase of the project, there will be a flurry of activity on site over a period of time, similar to during the construction phase, including dismantling and removal of equipment and rehabilitation. There may also be minor additional construction. Rehabilitation of various sites will also take place. These activities all have the potential to cause additional direct and/or indirect damage to natural habitat and vegetation.

- *Direct mortality of fauna due to machinery, decommissioning and increased traffic*

It is possible that individuals of species of concern, as well as other species, may suffer mortality or removal of individuals through road kills, encounters with infrastructure, illegal hunting, illegal collecting (especially for the tortoise and lizard) and possible damage to habitats. The animal species of particular concern for this project include the Karoo Dwarf Tortoise and the Armadillo Girdled Lizard. There are also other more mobile species that are protected by legislation, including the Honey Badger, Black-footed Cat, Leopard and Cape Fox.

- *Effects on physiological functioning of vegetation due to dust deposition*

There is a moderate risk during decommissioning that dust will be created that will settle on surrounding vegetation. This will be due to earth-moving equipment as well as vehicles moving around on site as well as into and out of the site. There will be a definite increase in the amount of traffic on access roads to the site that will also affect surrounding areas.

Indirect impacts include the following:

- *Displacement and/or disturbance of fauna due to increased activity and noise levels*

Decommissioning and rehabilitation activities may lead to loss of habitat, noise, dust and general activity that are likely to cause all mobile species to move away from the site. Mobile species of conservation concern that could potentially be affected by the proposed project are as follows:

- Honey Badger,
- Black-footed Cat,
- Leopard,
- Cape Fox,

- Grey Rhebok.

All these species are mobile terrestrial species with a large home range and the ability to travel long distances in short periods of time. Individuals may be locally displaced, but this will have little effect on the overall range of the species nor is it expected that any overall impacts will result from local displacement.

- *Continued establishment and spread of alien invasive plant species due to the presence of migration corridors and disturbance vectors*

The presence of disturbed surfaces on site creates ecological edges and corridors along which alien species can travel and become established.

- *Changes to behavioural patterns of animals, including possible migration away or towards the project area*

The increased human presence and/or decommissioning operations will increase noise levels as well as light levels at night. The increased human presence, elevated noise and light levels, loss of animal habitat and compaction of soils may alter the behavioural patterns of some animals. Some of these changes may favour certain species and negatively affect others and consequently change the composition of the animal communities. Some of these changes could possibly increase levels of predation. Territorial species such as steenbok, grey duiker and klipspringer will be negatively affected as well as species that live or move in the soil. These species might undergo a local reduction in their population size.

7.2.2 Agriculture and Soils

The Agricultural and Soils Compliance statement³⁴ was conducted by Johann Lanz (**SACNASP registration: 400268/12**) and is included as **Appendix 6A**. It should be noted that the document adheres to the process and content requirements of the gazetted agricultural protocol.

The focus and defining question of an agricultural impact assessment is to determine to what extent a proposed development will compromise (negative impacts) or enhance (positive impacts) current and/or potential future agricultural production. The significance of an impact is therefore a direct function of the degree to which that impact will affect current or potential future agricultural production. If there will be no impact on production, then there is no agricultural impact. Impacts that degrade the agricultural resource base, pose a threat to production and therefore are within the scope of an agricultural impact assessment. Lifestyle impacts on the resident farming community, for example visual impacts, do not necessarily impact agricultural production and, if they do not, are not relevant to and within the scope of an agricultural impact assessment.

For agricultural impacts, the exact nature of the different infrastructure within a development has very little bearing on the significance of impacts. What is of most relevance is simply the occupation of the land, and whether it is being occupied by a pylon base or a substation makes no difference. What is of most relevance therefore is simply the total footprint of the facility.

³⁴ Protocol for the specialist assessment and minimum report content requirements of environmental impacts on agricultural resources by onshore wind and/or solar photovoltaic energy generation facilities where the electricity output is 20 megawatts or more, gazetted on 20 March 2020 (Sections 24(5)(A) and (H) and 44 of NEMA, 1998).

7.2.2.1 Impact Identification and Description

Electrical grid infrastructure has negligible agricultural impact in this study area for two (2) reasons:

1. Overhead transmission lines have no agricultural impact because all agricultural activities that are viable in this environment (grazing) can continue completely unhindered underneath transmission lines.
2. The direct, permanent, physical footprint of the development that has any potential to interfere with agriculture, is restricted to pylon bases and a small substation that, in the context of the agricultural environment of low density grazing on farms which are typically thousands of hectares large, is entirely insignificant.

The only possible source of impact is minimal disturbance to the land during construction and decommissioning. The single agricultural impact is therefore minimal soil and land degradation (erosion and topsoil loss) as a result of land disturbance. Erosion can occur as a result of the alteration of the land surface run-off characteristics, which can be caused by construction related land surface disturbance, vegetation removal, and the establishment of hard surface areas including roads. Loss of topsoil can result from poor topsoil management during excavations. Soil degradation will reduce the ability of the soil to support vegetation growth. This is a direct, negative impact that applies to only two of the phases of the development (construction and decommissioning).

7.2.2.2 Micro-siting to Minimize Fragmentation and Disturbance of Agricultural Activities

The agricultural protocol requires confirmation that all reasonable measures have been taken through micro-siting to minimize fragmentation and disturbance of agricultural activities. However, the agricultural uniformity and low agricultural potential of the environment, means that the exact positions of all infrastructure will make no material difference to agricultural impacts. It is therefore unnecessary to check whether siting of infrastructure, and any layout of infrastructure within the assessed area is acceptable in terms of agricultural impact.

7.2.2.3 Confirmation of Linear Impact

The protocol provision of a linear impact confirmation only makes sense when the requirement for an Agricultural Compliance Statement is based on the fact that the development is a linear activity. In this case the low and medium agricultural sensitivity determines that an Agricultural Compliance Statement suffices. Nevertheless, it is hereby confirmed that, due to the low impact of this linear activity, the land can be returned to the current state within two years of completion of the construction phase.

7.2.2.4 Impact Assessment and Statement

An Agricultural Compliance Statement is not required to formally rate agricultural impacts. It is only required to indicate whether or not the proposed development will have an unacceptable impact on the agricultural production capability of the site. It must provide a substantiated statement on the acceptability, or not, of the proposed development and a recommendation on the approval, or not of the proposed development.

The conclusion of this assessment is that the proposed development will not have an unacceptable negative impact on the agricultural production capability of the site. The proposed development is therefore acceptable. This is substantiated by the following points:

- The proposed development is on land of very low agricultural potential.
- The amount of agricultural land loss is completely insignificant within the agricultural context.
- The proposed development poses a low risk in terms of causing soil degradation, which can be adequately and fairly easily managed by mitigation management actions. In addition, the degradation risk is only to land of low agricultural value, and the significance of the impact is therefore low.

Therefore, from an agricultural impact point of view, it is recommended that the development be approved

7.2.3 Surface Water Impacts

The Surface Water Impact Assessment was conducted by Christel du Preez of Freshwater Ecologist Network (FEN) Consulting (Pty) Ltd and is included in **Appendix 6E**.

Following the assessment of the watercourses associated with the proposed development, the impact assessment was applied to ascertain the significance of perceived impacts on the key drivers and receptors (hydrology, water quality, geomorphology, habitat and biota) of the identified watercourses. The impact assessment was undertaken for the proposed layout as provided by the proponent and as described in Section 3 of the Surface Water Impact Assessment Report and presented in **Figure 7**. The points below summarise the considerations made when applying the impact assessment:

- The risk assessment was applied considering the risk significance of the proposed surface infrastructure components, as described in Section 3 of the Surface Water Impact Assessment Report and depicted in **Figure 7**. Due to the similar areas the proposed power line alternative routes will be routed through (i.e. all power line alternative routed will be routed through mountainous areas traversing headwater EDLs and traversing tributaries and rivers within the lower laying southern area towards the Kappa Substation), the risk assessment was applied once for all the proposed alternatives. A comparative assessment of the proposed power line alternatives is provided in Section 7 of the Surface Water Impact Assessment Report which considered the outcome of the risk assessment;
- At the time of this assessment the layout for any access roads to the proposed power line and substations (potential new and those requiring upgrading) was not available. As such, it is assumed that the existing informal farm roads will be used as access roads. It is assumed that these roads will be used as is or will be graded (but the width of the roads will remain the same) to accommodate construction vehicles. No formal construction of roads, widening of roads, use of tar or concrete, was considered as part of this risk assessment;
- Although the preferential flow paths are not considered true watercourses, the potential risk significance of the proposed development was nevertheless included in the DWS Risk Assessment as these features are linked to natural watercourses;
- The risk assessment was applied assuming that a high level of mitigation is implemented, thus the results of the risk assessment provided in this report present the perceived impact significance **post-mitigation**;
- In applying the risk assessment, it was assumed that the mitigation hierarchy as advocated by the DEFF *et al.*, (2013) would be followed, i.e. the impacts would first be avoided, minimised if avoidance is not feasible, rehabilitated as necessary and offset if required. **In this regard, the risk assessment was undertaken assuming that the location of the proposed power line pylons and substation sites will be located at least 32 m (outside the 32m regulated zone in accordance with the NEMA from the delineated extent of a watercourse.** This will conform to the mitigation hierarchy of the DEFF *et al.*, (2013), to avoid significant impacts to the watercourses;

- Since it is expected that the 100 m GN509 ZoR cannot be avoided for the placement of pylons, the legal issues for the construction of pylons were scored a maximum value of “5”;
- The activities relating to the proposed development are all highly site specific, not of a significant extent relative to the area of the watercourses assessed, and therefore have a limited spatial extent;
- While the operation of the proposed power line and substations will be a permanent activity, the installation thereof is envisioned to take no more than a few months. However, the frequency of the construction impacts may be daily during this time;
- Most impacts are considered to be easily detectable; and
- The considered mitigation measures are easily practicable.

The activities associated with the construction and operational phases of the proposed development based on the alignment provided by the proponent, includes site preparation, excavation of pits installation of the pylons at least 32m from the delineated extent of watercourses, poses a Low risk significance to the watercourses, with the implementation of the recommended mitigation measures. As such, all mitigation measures as stipulated must be implemented to prevent any negative edge effects from occurring on the watercourses. Due to the similar areas the proposed power line alternative routes will be routed through (i.e. all power line alternative routed will be routed through mountainous areas traversing headwater EDLs and traversing tributaries and rivers within the lower laying southern area towards the Kappa Substation), all the proposed power line alternative routes are considered to pose a Low risk significance to the identified watercourses. A comparative assessment of the proposed power line alternatives is provided in Section 7 of the Surface Water Impact Assessment Report which considered the outcome of the risk assessment;

Assuming that strict enforcement of cogent, well-developed mitigation measures takes place, the significance of impacts arising from the proposed power line and substation development are likely to be reduced during the construction and operational phases assuming that a high level of mitigation takes place. Additional “good practice” mitigation measures applicable to a project of this nature are provided in Appendix F of the Surface Water Impact Assessment Report.

7.2.3.1 Design phase / pre-construction impacts

No impact occurs during the Design Phase of the project. Nevertheless, measures taken during the Design Phase of the project can potentially have a significant effect on the nature, extent and intensity of impacts experienced during the Construction Phase.

However, based on the findings of the Surface Water Specialist, the Applicant (Oya Energy) refined and has amended the layout of alternatives based on the recommend buffers and ‘no-go’ areas identified. This is discussed in more detail in **section 8**.

7.2.3.2 Construction Phase Impacts

Direct impacts

Direct impacts include the following:

- Potential direct impacts caused by site preparation activities such as the removal of vegetation and associated disturbances to soils, and access to the site, including grading of new and existing informal farm roads through watercourses. These activities result in the disturbance to habitat and loss of ecoservices.

Indirect Impacts

Indirect impacts include the following:

- Potential indirect impacts caused by site preparation activities (clearing areas for the installation of pylons outside the watercourses and its associated 32m NEMA ZoR) includes the disturbance of the natural buffer area surrounding the watercourses, potentially resulting dust creation, and decrease of surface roughness.
- The installation of the pylons (including mixing and casting of concrete for foundations) and spanning of the proposed power line entails:
 - Excavation of pits for the pylons leading to stockpiling of soil; and
 - Potential movement of construction equipment and personnel in the areas surrounding watercourses.

This may result in indirect impacts (since no pylons will be located directly within watercourses) such as:

- Disturbances of soils leading to potential impacts to the watercourse vegetation, increased alien vegetation proliferation in the footprint areas, and in turn to altered watercourse habitat; and
- Altered runoff patterns, leading to increased erosion and sedimentation of the watercourses.

7.2.3.3 Operational Phase Impacts

Direct impacts

None

Indirect Impacts

Operation and maintenance of the power line and substation may result in:

- Potential indiscriminate movement of maintenance vehicles within the watercourses or within close proximity to the watercourses; and
- Increased risk of sedimentation and/or hydrocarbons entering the watercourses via stormwater runoff from the access roads.

The expected impacts may potentially be:

- Disturbance to soils and ongoing erosion as a result of periodic maintenance activities; and
- Altered water quality (if surface water is present) as a result of increased availability of pollutants.

7.2.3.4 Decommissioning Phase Impacts

Direct impacts

Potential impacts that may result due to the decommissioning activities:

- Clearing of habitat that has established in previous phases, resulting in a disturbed ecological structure;
- Compaction and disturbance of soils due to decommissioning activities, making the impacted areas unfavourable for the establishment of vegetation and may allow opportunistic alien and invasive species to establish in the nearby watercourses; and
- Movement of construction vehicles within the watercourses, disturbing established biota therein.

7.2.4 Avifaunal Impacts

The Avifaunal Impact Assessment has been conducted by Chris van Rooyen and Albert Fronemann of Chris van Rooyen Consulting and is included in **Appendix 6B**. The proposed development will have several **direct** impacts on priority avifauna. No **indirect** impacts are envisaged.

The direct impacts can be summarised as follows:

- Displacement of priority species due to habitat destruction in the substation footprint, and due to disturbance associated with the construction activities
- Mortality of priority species due to electrocutions in the substation yard
- Mortality of priority species due to collisions with the 132kV OHL

Negative impacts on avifauna by electricity infrastructure generally take two (2) main forms namely electrocution and collisions (Ledger & Annegarn 1981; Ledger 1983; Ledger 1984; Hobbs and Ledger 1986a; Hobbs & Ledger 1986b; Ledger, Hobbs & Smith, 1992; Verdoorn 1996; Kruger & Van Rooyen 1998; Van Rooyen 1998; Kruger 1999; Van Rooyen 1999; Van Rooyen 2000; Van Rooyen 2004; Jenkins *et al.*, 2010). Displacement due to habitat destruction and disturbance associated with the construction of the electricity infrastructure is another impact that could potentially impact on avifauna.

The section below provides an overview of the envisaged impacts of the proposed development on priority species. Impact tables are provided which summarises the impacts and proposed mitigation for the proposed development.

No impact occurs during the Design Phase of the project. Nevertheless, measures taken during the Design Phase of the project can potentially have a significant effect on the nature, extent and intensity of impacts experienced during the Construction Phase.

However, based on the findings of the Avifauna Specialist, the applicant (Oya Energy) refined the layout based on the recommend buffers and 'no-go' areas identified. This is discussed in more detail in **section 8**.

7.2.4.1 Design phase / pre-construction impacts

Direct Impacts

None

Indirect Impacts

None

7.2.4.2 Construction Phase Impacts

Direct Impacts

- *Displacement of priority species due to habitat destruction in the substation footprint and disturbance associated with the construction activities (construction and decommissioning)*

During the construction (and decommissioning) of power lines, service roads (jeep tracks) and substations, habitat destruction / transformation inevitably takes place. The construction activities will constitute the following:

- Site clearance and preparation
- Construction of the infrastructure (i.e. the on-site substation, OHL and service road)
- Transportation of personnel, construction material and equipment to the site, and personnel away from the site;

- Removal of vegetation for the proposed substation and stockpiling of topsoil and cleared vegetation
- Excavations for infrastructure

These activities could impact on birds breeding, foraging and roosting in or in close proximity of the proposed transmission substation through **transformation of habitat**, which could result in temporary or permanent displacement. Unfortunately, very little mitigation can be applied to reduce the significance of this impact as the total permanent transformation of the natural habitat within the construction footprint of the substation yard is unavoidable. Fortunately, due to the nature of the vegetation, and judged by the existing power lines, very little if any vegetation clearing will be required in the power line servitudes. The habitat in the study area is very uniform from a bird impact perspective; therefore, the loss of habitat for priority species due to direct habitat transformation associated with the construction of the proposed substation is likely to be fairly minimal. The species most likely to be directly affected by this impact would be small, non-Red Data species.

Apart from direct habitat destruction, the above-mentioned activities also impact on birds through **disturbance**; this could lead to breeding failure if the disturbance happens during a critical part of the breeding cycle. Construction activities in close proximity to breeding locations could be a source of disturbance and could lead to temporary breeding failure or even permanent abandonment of nests. A potential mitigation measure is the timeous identification of nests and the timing of the construction activities to avoid disturbance during a critical phase of the breeding cycle, although in practice that can admittedly be very challenging to implement. Large terrestrial species namely Ludwig's Bustard, Karoo Korhaan and Southern Black Korhaan are most likely to be affected by displacement due to disturbance. Cliff-nesting Jackal Buzzards, Booted Eagles, Verreaux's Eagles and Black Storks could also potentially be vulnerable to this impact.

The priority species which are potentially vulnerable to this impact are listed in **Table 22**, and below. Species with a high likelihood of regular occurrence in the study area are in **bold**:

- **Verreaux's Eagle**
- **White-necked Raven**
- **Lanner Falcon**
- **Booted Eagle**
- Cape Crow
- **Jackal Buzzard**
- **Martial Eagle**
- **Karoo Korhaan**
- **Ludwig's Bustard**
- Secretarybird
- **Greater Kestrel**
- **Pied Crow**
- Southern Black Korhaan
- **Rock Kestrel**
- Black Stork

Indirect Impacts

None

7.2.4.3 Operational Phase Impacts

Direct Impacts

- *Mortality of priority species due to electrocutions in the substation yard*

Electrocution refers to the scenario where a bird is perched or attempts to perch on the electrical structure and causes an electrical short circuit by physically bridging the air gap between live components and/or live and earthed components (Van Rooyen 2004). The electrocution risk is largely determined by the pole/tower design. In the case of the proposed power lines, no electrocution risk is envisaged because the proposed design of the 132kV line, namely the steel monopole and self-supporting lattice structures, should not pose an electrocution threat to any of the priority species which are likely to occur in the study area. Electrocutions within the proposed transmission substation yard are possible but should not affect the more sensitive Red Data bird species, as these species are unlikely to use the infrastructure within the substation yard for perching or roosting. Species that are more vulnerable to this impact are corvids, owls and certain species of waterbirds. The priority species which are potentially vulnerable to this impact are listed in **Table 22**, and below. Species with a high likelihood of regular occurrence in the study area are in **bold**:

- Cape Crow
- **Greater Kestrel**
- **Hadeda Ibis**
- **Pied Crow**
- **Rock Kestrel**
- **Spotted Eagle-owl**
- **White-necked Raven**
- Black-headed Heron
- **Egyptian Goose**

- *Mortality of priority species due to collisions with the 132kV OHL*

Collisions are the biggest threat posed by transmission lines to birds in southern Africa (Van Rooyen 2004). Most heavily impacted upon are bustards, storks, cranes and various species of waterbirds, and to a lesser extent, vultures. These species are mostly heavy-bodied birds with limited manoeuvrability, which makes it difficult for them to take the necessary evasive action to avoid colliding with transmission lines (Van Rooyen 2004, Anderson 2001). In a PhD study, Shaw (2013) provides a concise summary of the phenomenon of avian collisions with transmission lines:

“The collision risk posed by power lines is complex and problems are often localised. While any bird flying near a power line is at risk of collision, this risk varies greatly between different groups of birds, and depends on the interplay of a wide range of factors (APLIC 1994). Bevanger (1994) described these factors in four main groups – biological, topographical, meteorological and technical. Birds at highest risk are those that are both susceptible to collisions and frequently exposed to power lines, with waterbirds, gamebirds, rails, cranes and bustards usually the most numerous reported victims (Bevanger 1998, Rubolini et al., 2005, Jenkins et al., 2010).

The proliferation of man-made structures in the landscape is relatively recent, and birds are not evolved to avoid them. Body size and morphology are key predictive factors of collision risk, with large-bodied birds with high wing loadings (the ratio of body weight to wing area) most at risk (Bevanger 1998, Janss 2000). These birds must fly fast to remain airborne, and do not have sufficient manoeuvrability to avoid unexpected obstacles. Vision is another key biological factor, with many collision-prone birds principally using lateral vision to navigate in flight, when it is the lower-resolution, and often restricted, forward vision that is useful to detect obstacles (Martin & Shaw 2010, Martin 2011, Martin et al., 2012). Behaviour is important, with birds flying in flocks, at low levels and in crepuscular or nocturnal conditions at higher risk of collision (Bevanger 1994). Experience affects risk, with migratory and nomadic species that spend much of their time in unfamiliar locations also expected to collide more often (Anderson 1978, Anderson 2002). Juvenile birds have often been reported as being more collision-prone than adults (e.g. Brown et al., 1987, Henderson et al., 1996).

Topography and weather conditions affect how birds use the landscape. Power lines in sensitive bird areas (e.g. those that separate feeding and roosting areas, or cross flyways) can be very dangerous (APLIC 1994, Bevanger 1994). Lines crossing the prevailing wind conditions can pose a problem for large birds that use the wind to aid take-off and landing (Bevanger 1994). Inclement weather can disorient birds and reduce their flight altitude, and strong winds can result in birds colliding with power lines that they can see but do not have enough flight control to avoid (Brown et al., 1987, APLIC 2012).

The technical aspects of power line design and siting also play a big part in collision risk. Grouping similar power lines on a common servitude, or locating them along other features such as tree lines, are both approaches thought to reduce risk (Bevanger 1994). In general, low lines with short span lengths (i.e. the distance between two adjacent pylons) and flat conductor configurations are thought to be the least dangerous (Bevanger 1994, Jenkins et al., 2010). On many higher voltage lines, there is a thin earth (or ground) wire above the conductors, protecting the system from lightning strikes. Earth wires are widely accepted to cause the majority of collisions on power lines with this configuration because they are difficult to see, and birds flaring to avoid hitting the conductors often put themselves directly in the path of these wires (Brown et al., 1987, Faanes 1987, Alonso et al. 1994a, Bevanger 1994).”

From incidental record keeping by the Endangered Wildlife Trust, it is possible to give a measure of what species are generally susceptible to power line collisions in South Africa (see **Figure 70** below).

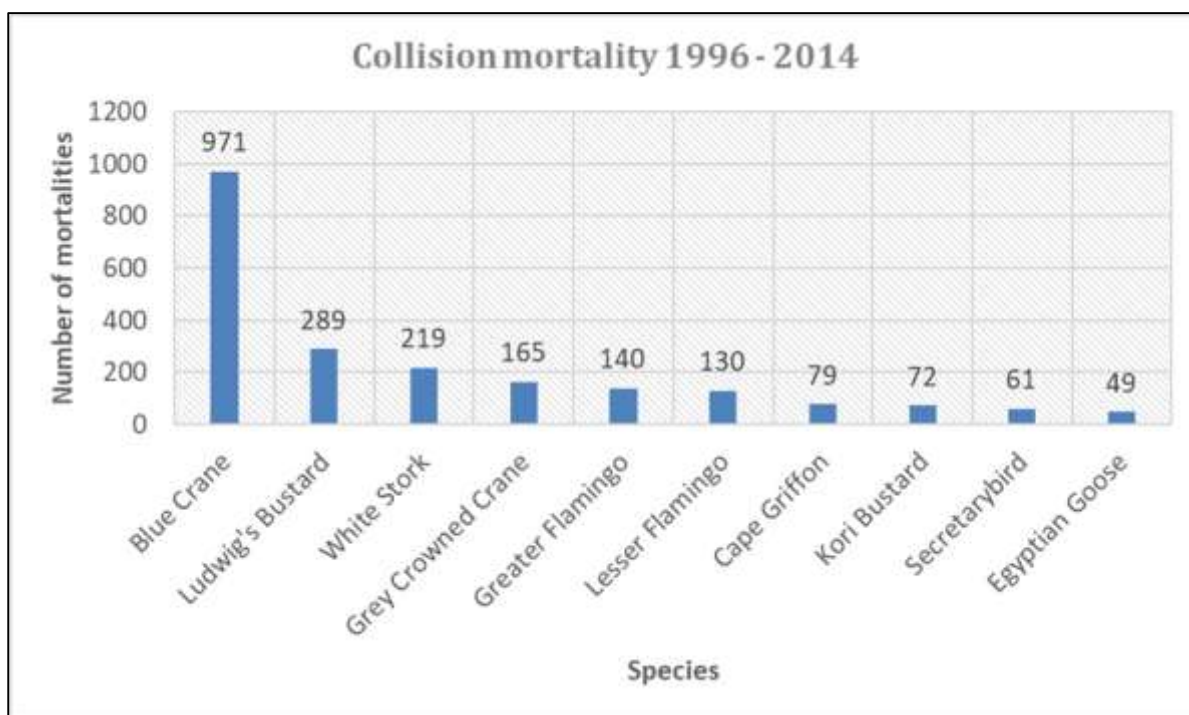


Figure 70: The top 10 collision prone bird species in South Africa, in terms of reported incidents contained in the Eskom / Endangered Wildlife Trust Strategic Partnership central incident register 1996 - 2014 (EWT unpublished data)

Power line collisions are generally accepted as a key threat to bustards (Raab et al., 2009; Raab et al., 2010; Jenkins & Smallie 2009; Barrientos et al., 2012, Shaw 2013). In a recent study, carcass surveys were performed under high voltage transmission lines in the Karoo for two years, and low voltage distribution lines for one (1) year (Shaw 2013). Ludwig's Bustard was the most common collision victim (69% of carcasses), with bustards generally comprising 87% of mortalities recovered. Total annual mortality was estimated at 41% of the Ludwig's Bustard population, with Kori Bustards also dying in

large numbers (at least 14% of the South African population killed in the Karoo alone). Karoo Korhaan was also recorded, but to a much lesser extent than Ludwig's Bustard. The reasons for the relatively low collision risk of this species probably include their smaller size (and hence greater agility in flight) as well as their more sedentary lifestyles, as local birds are familiar with their territory and are less likely to collide with power lines (Shaw 2013).

Several factors are thought to influence avian collisions, including the manoeuvrability of the bird, topography, weather conditions and power line configuration. An important additional factor that previously has received little attention is the visual capacity of birds; i.e. whether they are able to see obstacles such as power lines, and whether they are looking ahead to see obstacles with enough time to avoid a collision. In addition to helping explain the susceptibility of some species to collision, this factor is key to planning effective mitigation measures. Recent research provides the first evidence that birds can render themselves blind in the direction of travel during flight through voluntary head movements (Martin & Shaw 2010). Visual fields were determined in three bird species representative of families known to be subject to high levels of mortality associated with power lines i.e. Kori Bustards *Ardeotis kori*, Blue Cranes *Anthropoides paradiseus* and White Storks *Ciconia ciconia*. In all species the frontal visual fields showed narrow and vertically long binocular fields typical of birds that take food items directly in the bill under visual guidance. However, these species differed markedly in the vertical extent of their binocular fields and in the extent of the blind areas which project above and below the binocular fields in the forward-facing hemisphere. The importance of these blind areas is that when in flight, head movements in the vertical plane (pitching the head to look downwards) will render the bird blind in the direction of travel. Such movements may frequently occur when birds are scanning below them (for foraging or roost sites, or for conspecifics). In bustards and cranes pitch movements of only 25° and 35°, respectively, are sufficient to render the birds blind in the direction of travel; in storks, head movements of 55° are necessary. That flying birds can render themselves blind in the direction of travel has not been previously recognised and has important implications for the effective mitigation of collisions with human artefacts including wind turbines and power lines. These findings have applicability to species outside of these families especially raptors (*Accipitridae*) which are known to have small binocular fields and large blind areas similar to those of bustards and cranes, and are also known to be vulnerable to power line collisions.

Despite doubts about the efficacy of line marking to reduce the collision risk for bustards (Jenkins *et al.*, 2010; Martin *et al.*, 2010), there are numerous studies which prove that marking a line with PVC spiral type Bird Flight Diverters (BFDs) generally reduce mortality rates (e.g. Bernardino *et al.*, 2018; Sporer *et al.*, 2013, Barrientos *et al.*, 2011; Jenkins *et al.*, 2010; Alonso & Alonso 1999; Koops & De Jong 1982), including to some extent for bustards (Barrientos *et al.*, 2012; Hoogstad 2015 pers.comm). Beaulaurier (1981) summarised the results of 17 studies that involved the marking of earth wires and found an average reduction in mortality of 45%. Barrientos *et al.*, (2011) reviewed the results of 15 wire marking experiments in which transmission or distribution wires were marked to examine the effectiveness of flight diverters in reducing bird mortality. The presence of flight diverters was associated with a decrease of 55–94% in bird mortalities. Koops and De Jong (1982) found that the spacing of the BFDs was critical in reducing the mortality rates - mortality rates are reduced up to 86% with a spacing of 5m, whereas using the same devices at 10m intervals only reduces the mortality by 57%. Barrientos *et al.*, (2012) found that larger BFDs were more effective in reducing Great Bustard collisions than smaller ones. Line markers should be as large as possible, and highly contrasting with the background. Colour is probably less important as during the day the background will be brighter than the obstacle with the reverse true at lower light levels (e.g. at twilight, or during overcast conditions). Black and white interspersed patterns are likely to maximise the probability of detection (Martin *et al.*, 2010).

Using a controlled experiment spanning a period of nearly eight years (2008 to 2016), the Endangered Wildlife Trust (EWT) and Eskom tested the effectiveness of two types of line markers in reducing power line collision mortalities of large birds on three 400kV transmission lines near Hydra substation in the

Karoo. Marking was highly effective for Blue Cranes, with a 92% reduction in mortality, and large birds in general with a 56% reduction in mortality, but not for bustards, including the endangered Ludwig's Bustard. The two different marking devices were approximately equally effective, namely spirals and bird flappers, they found no evidence supporting the preferential use of one type of marker over the other (Shaw *et al.*, 2017).

The most likely Red Data candidates for collision mortality on the proposed powerline are large terrestrial species e.g. bustards, korhaans and Secretarybird, certain raptors and storks, particularly Verreaux's Eagles, Jackal Buzzards and Black Storks where the line drops down the escarpment, and waterbirds at drainage lines and waterbodies. The priority species which are potentially vulnerable to this impact are listed in **Table 22**, and below. Species with a high likelihood of regular occurrence in the study area are in **bold**:

- **Hadeda Ibis**
- Black-headed Heron
- **Egyptian Goose**
- Black Harrier
- **Booted Eagle**
- **Jackal Buzzard**
- **Martial Eagle**
- **Verreaux's Eagle**
- African Black Duck
- African Sacred Ibis
- Cape Teal
- Hamerkop
- **Karoo Korhaan**
- **Ludwig's Bustard**
- **Namaqua Sandgrouse**
- Pied Avocet
- Red-knobbed Coot
- Secretarybird
- **South African Shelduck**
- Southern Black Korhaan
- Yellow-billed Duck
- Black Stork

Indirect Impacts

None

7.2.4.4 Decommissioning Phase Impacts

Direct Impacts

- *Displacement of priority species due to disturbance associated with the decommissioning activities*

Decommissioning phase impacts are identical to those identified for the construction phase.

Indirect Impacts

None

7.2.5 Heritage, Archaeological, Palaeontological and Cultural Landscape Impacts

The HIA (including Archaeology, Palaeontology and Cultural Landscapes) was conducted by Jenna Lavin of CTS Heritage and is included in **Appendix 6C**.

7.2.5.1 Assessment of Impact to Archaeological Resources

Based on the assessment completed, the area proposed for development has an overall low archaeological sensitivity. It is unlikely that the proposed development of the 132kV overhead power line and substations will negatively impact on significant archaeological heritage as the footprint of the power line and substation infrastructure is limited.

Despite the abundance of diffusely scattered archaeological material, no intact and cohesive sites were found that have not been significantly altered through erosion and deflation in the exposed plains covering much of this route.

The survey has provided a very good account of the range of archaeological material that is present in the area and is entirely consistent with the previous studies for the wind and solar farms that are proposed or already constructed.

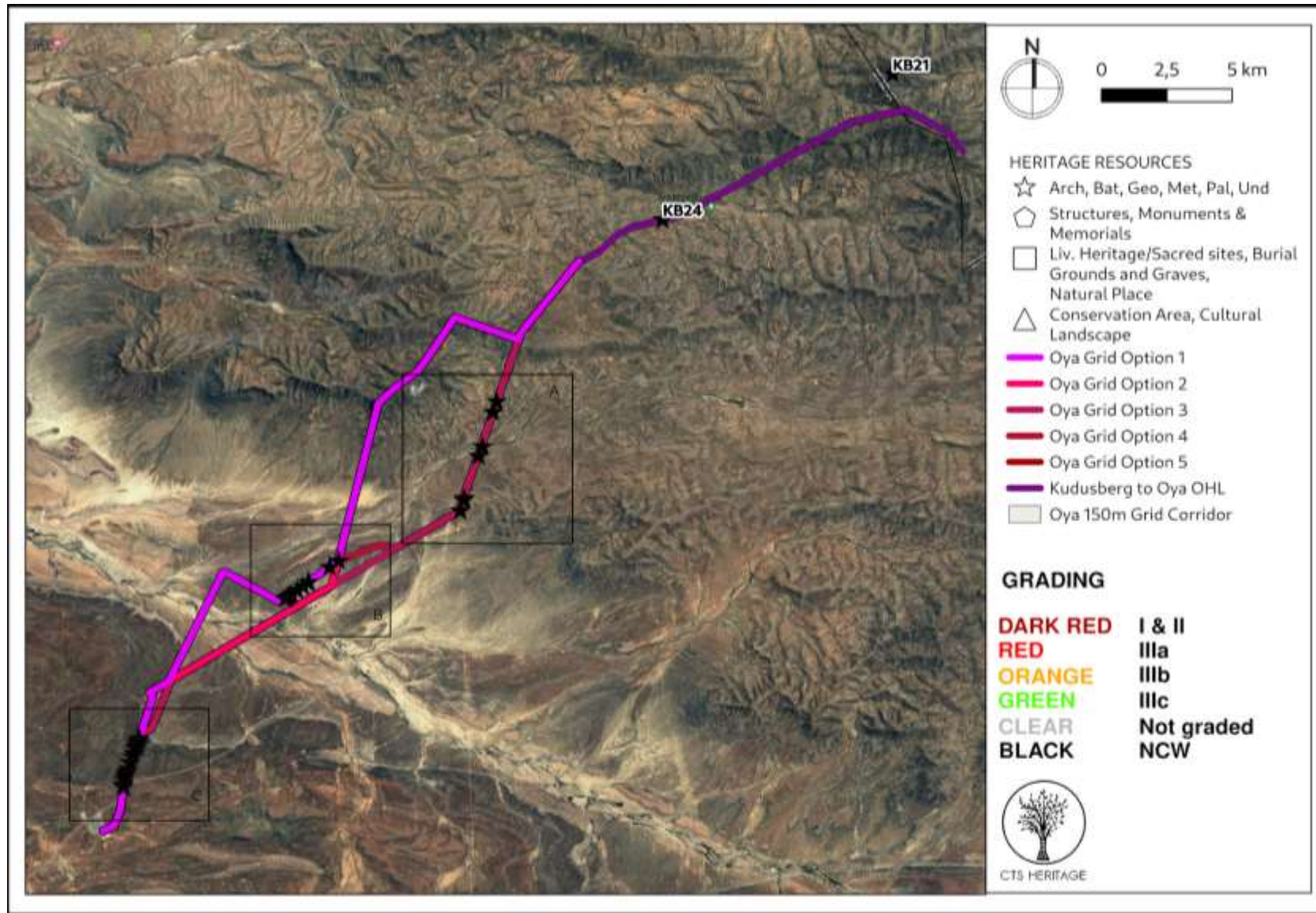


Figure 71: Map of heritage resources identified during the field assessment relative to the proposed development footprint

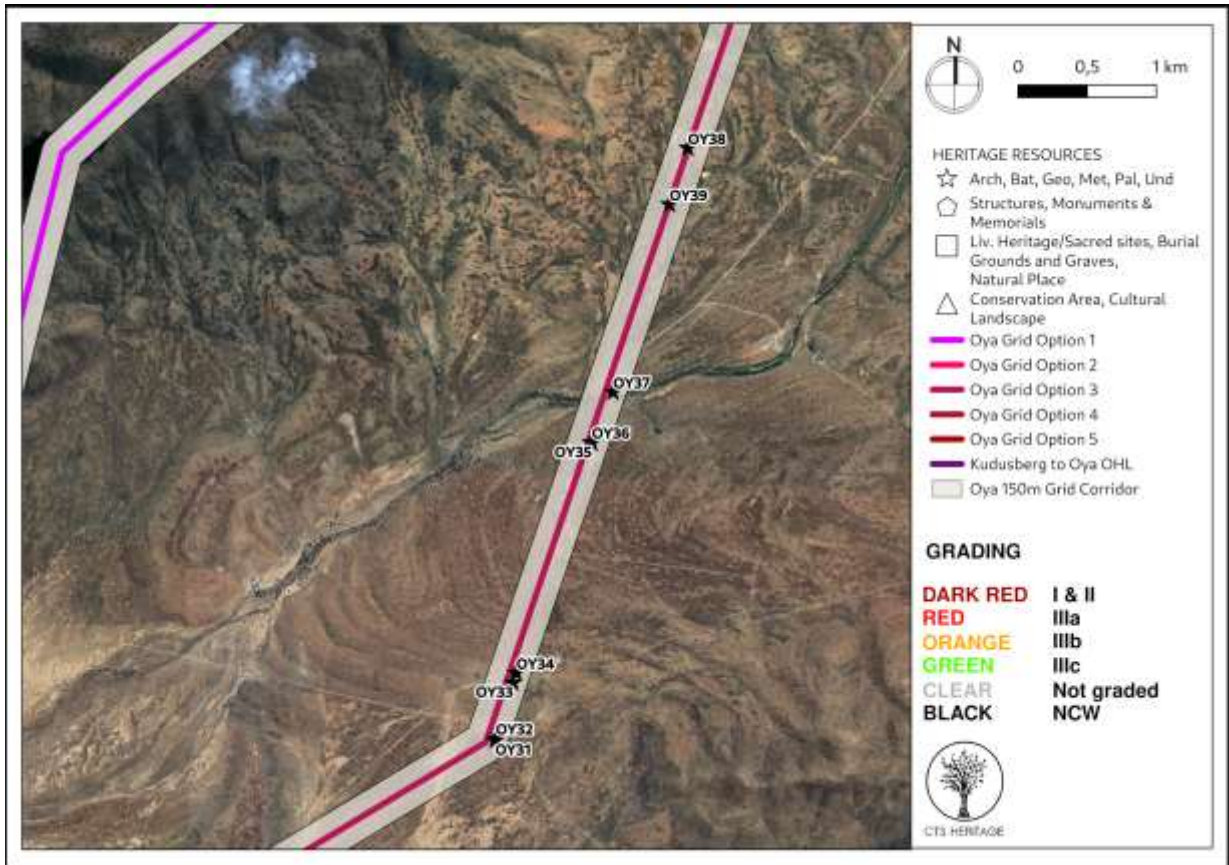


Figure 72: Inset A

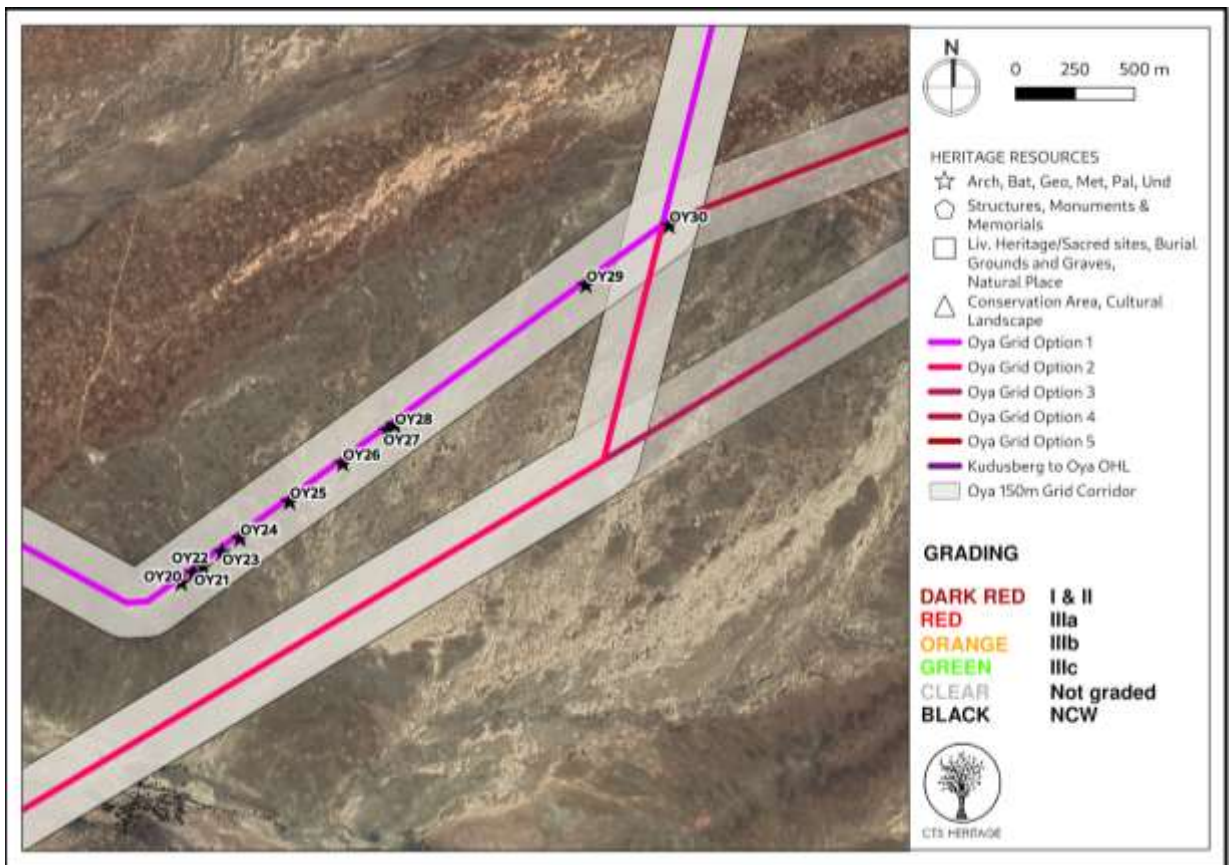


Figure 73: Inset B

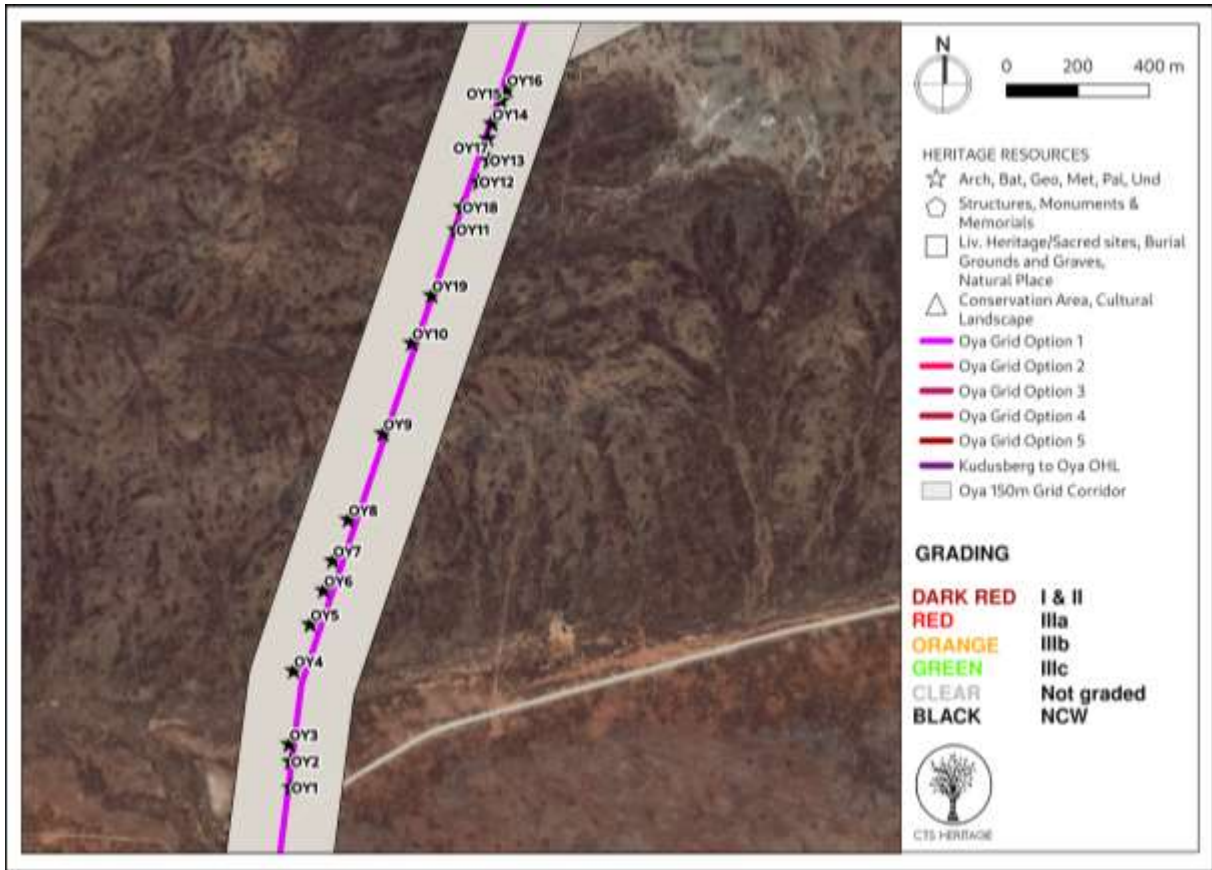


Figure 74: Inset C

The proposed development is underlain by potentially fossiliferous sediment of the Karoo Supergroup. These include deltaic and marine deposits of the Waterford Formation, Tierberg Formation, Skoorsteen Formation, Prince Albert Formation, containing plant and trace fossils, crustaceans, and arthropods, the Dwyka Group glacial sediments, but most importantly the Abrahamskraal Formation with the Tapinocephalus Assemblage Zone. Scientifically valuable, well-preserved fossils are exceedingly rare in this area, with an unpredictable distribution. For this reason, it is unlikely that the development will have a significant effect on the area, provided that the chance fossil find procedure is followed in the possible case of a fossil being found.

7.2.5.2 Design phase / Pre-Construction impacts

No impact occurs during the Design Phase of the project. Nevertheless, measures taken during the Design Phase of the project can potentially have a significant effect on the nature, extent and intensity of impacts experienced during the Construction Phase.

7.2.5.3 Construction Phase Impacts

Impacts during the construction phase include the following:

- Impacts to archaeological heritage resources
- Impacts to palaeontological resources
- Impacts to the cultural landscape

Impacts to archaeological, palaeontological and other heritage resources are anticipated during this phase. Most of the archaeological and palaeontological resources identified within the preferred

alternative alignment are considered to be not conservation-worthy. The remaining sites of cultural significance located within the proposed alignment of the preferred alternative can be avoided through the implementation of buffer areas and 'no-go' areas.

Table 31: List of heritage resources located within the proposed development corridor with mitigation measures

Site No.	Site Name	Description	Type	Co-ordinates		Grading	Mitigation
130730	OYPV-09	Three grave features including a medium-density scatter of MSA and LSA stone tools	Archaeological	- 32.909831	20.202653	IIIA	100m buffer to ensure no impact
130768	BKRN031	Waterford Formation. Good riverbed and bank exposures of tabular, greyish wackes with undulose or wave-rippled tops. Thin, fissile, medium-grained, laminated, greyish sandy interbeds, locally ferruginised, towards base of package of medium- to thick-bedded wackes (horizontally to current ripple cross-laminated) containing dense hash of transported plant debris – mainly stems, including probable sphenophytes - preserved as moulds where weathered and carbonaceous compressions in fresher material. Some possible axes up to 10 cm across.	Palaeontological	- 32.909361	20.201889	IIIA	50m buffer
130772	BKRN034	Waterford Formation. Hillslope exposure of grey-green mudrocks with large ferruginous carbonate diagenetic concretions and package of tabular, thin-bedded wackes. Small float block of silicified wood.	Palaeontological	- 32.933389	20.177833	IIIC	50m buffer to ensure no impact
130981	KDB012	Circular cobble-built structure, piled stone, likely hut or shelter	Structure	- 32.864056	20.308778	IIIC	50m buffer to ensure no impact

130760	BKNR023	Lower Abrahamskraal Fm Riverine (probably Combrinkskraal Member equivalent). Exposure of well-jointed top and interior of thick, medium-grained channel sandstone with dispersed moulds of plant debris including indeterminate plant axes up to several cm wide, tongue-shaped glossopterid leaves, some retaining an original spatulate 3D morphology (uncompressed), clear midrib but fine venation on lamina is very faint or absent. Associated thin mudflake intraclast breccias	Palaeontological	- 32.893528	20.243944	IIIB	50m buffer to ensure no impact
130761	BKNR024	Lower Abrahamskraal Fm Riverine (probably Combrinkskraal Member equivalent). Excellent steep streambank sections through thick, tabular-bedded channel sandstone complex with well-developed coarse, poorly-sorted, monomict / oligomict mudrock intraclast breccias up to 2m or so thick at several horizons, locally with sharply erosive bases cutting down into tabular-bedded sandstones (No reworked calcrete or fossils seen in situ within breccias)	Palaeontological	- 32.893694	20.243444	IIIA	50m buffer to ensure no impact
NA	NA	Gatsrivier CLA	Cultural Landscape	-32.8919	20.2905	IIIB	No go area
NA	NA	Historic road river crossings	Cultural Landscape	NA	NA	IIIC	100m buffer
NA	NA	River Confluences	Cultural Landscape	NA	NA	IIIB	100m buffer
NA	NA	Baakensriver CLA	Cultural Landscape	-32.9015	20.1859	IIIA	No go area
NA	NA	Ridge lines	Cultural Landscape	NA	NA	II	No go area

NA	NA	Historic trunk road	Cultural Landscape	NA	NA	IIIA	50m buffer
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7.2.5.4 Operational Phase Impacts

No impacts to archaeological or palaeontological resources are anticipated during this phase. However, long term impacts to the sense of place and cultural landscape will occur due to the additional large infrastructure erected on the landscape. The nature of these impacts is cumulative and as such, these impacts are addressed further below in **section 7.5**.

7.2.5.5 Decommissioning Phase Impacts

No impacts to heritage resources are anticipated during this phase.

7.2.6 Socio-Economic Impacts

The Socio-Economic Impact Assessment was conducted by Dr Neville Bews & Associates and is included in **Appendix 6D**.

7.2.6.1 Design Phase / Pre-construction Impacts

The need for Eskom to purchase a specified amount of electricity from independent power producers has recently been gazetted (Government Gazette No. 43734 Notice No. 1015 Department of Mineral Resources and Energy, 2020). In addition, a review of applicable policy and legislation shows support on an international; national; regional and local government level for the provision of renewable energy into the National Grid. In this sense, the project is a necessary component in meeting these requirements by providing the necessary infrastructure to connect the proposed Oya Energy Facility (DEFF Ref No.: [14/12/16/3/3/2/2009](#)), and potentially other nearby developments, into the National Grid and consequently positively fitting with relevant planning criteria.

A sensitivity verification, undertaken on 08 October 2020, did not identify any socially linked restrictions, exclusions or prohibitions that apply to the proposed development site or any socially sensitive features on the site. It is therefore unlikely that any negative social impacts will be associated with the planning / pre-construction phase of the project.

7.2.6.2 Construction Phase Impacts

Most of the impacts discussed above apply over the short-term to the construction phase of the project and include:

- Health and social wellbeing impact
 - Annoyance, air quality and noise
 - Increase in crime
 - Increased risk of HIV infections

An influx of construction workers

- Hazard exposure
- Quality of the living environment
 - Disruption of daily living patterns
- Economic
 - Job creation and skills development
 - Socio-economic stimulation

7.2.6.3 Operational Phase Impacts

The social impacts that apply to the operational phase of the project are:

- Health and well-being
 - Electromagnetic fields
- Quality of the living environment
 - Transformation of the sense of place
- Economic
 - Socio-Economic stimulation

7.2.6.4 Decommissioning Phase Impacts

Considering the time to decommissioning, the uncertainty of what would exactly occur over this period and the significance of the impact in isolation; it would be rather meaningless to attach assessment criteria to decommissioning at this point. Apart from this, once the project is commissioned it will become an Eskom and as such could have an extended life span.

7.2.7 Visual Impacts

The VIA was conducted by Kerry Schwartz of SiVEST and is included in **Appendix 6G**.

Power line towers and substations are very large objects and thus highly visible. At this stage, the maximum tower height envisaged for the proposed power line is 45m (equivalent in height to a fifteen storey building). Although a tower structure would be less visible than a building, the height of the structure means that the tower would still typically be visible from a considerable distance. Visibility would be increased by the fact that the power line comprises a series of towers typically spaced approximately 200m to 250m apart in a linear alignment.

The degree of visibility of an object informs the level and intensity of the visual impact, but other factors also influence the nature of the visual impact. The landscape and aesthetic context of the environment in which the object is placed, as well as the perception of the viewer are also important factors. In the context of a power line, the type of tower used as well as the degree to which the towers would impinge upon or obscure a view is also a factor that will influence the experience of the visual impacts.

As described above, power lines and substations are not features of the natural environment, but are rather representative of human (anthropogenic) alteration of the natural environment. Thus a power line or substation could be perceived to be highly incongruous in the context of a largely natural landscape. The height and linear nature of the power line will exacerbate this incongruity, as the towers may impinge on views within the landscape. In addition, the practice of clearing any taller vegetation from

areas within the power line servitude can increase the visibility and incongruity of the power line. In a largely natural, bushier setting, vegetation clearance will cause fragmentation of the natural vegetation cover, thus making the power line more visible and drawing the viewer's attention to the power line servitude.

As mentioned above, the viewer's / receptor's perception of the development is also very important, as certain receptors may not consider the development of a power line or substation to be a negative visual impact. The scenic / aesthetic value of an area and the prevalent land use practices also tend to affect people's perception of whether a power line and/or substation is an unwelcome intrusion, and this in turn will determine the sensitivity of the identified receptors to the proposed development.

Power lines and substations are often perceived as visual impacts in areas where value is placed on the scenic or aesthetic character of the area, and where activities, which are based upon the enjoyment of, or exposure to, the scenic or aesthetic features of the area are practiced. Sensitivity to visual impacts is typically most pronounced in areas set aside for conservation of the natural environment (such as protected natural areas or conservancies), or in areas in where the natural character or scenic beauty of the area attracts visitors (tourists). Residents and visitors to these areas may perceive power lines and associated infrastructure to be an unwelcome intrusion that would degrade the natural character and scenic beauty of the area, and which could potentially even compromise the practicing of tourism activities in the area. In this instance, the area is not typically valued for its tourism significance and no formal protected areas, leisure-based tourism activities or recognised tourism routes were identified in the area.

Conversely, the presence of other anthropogenic objects associated with the built environment may influence the perception of whether a power line and/or substation is a visual impact. Where industrial-type built-form exists, (such as renewable energy facilities, roads, railways and other power lines and substations), the visual environment could be considered to be "degraded" and thus the introduction of a new power line and substation into this setting may be considered to be less of a visual impact than if there was no existing built infrastructure visible. In this context therefore, the presence of the Kappa substation and the existing high voltage power lines traversing the study area, in conjunction with the Perdekraal East WEF, is expected to lessen the visual contrast associated with the introduction of a new power line and substation.

Other factors, as listed below, can also affect the nature and intensity of a potential visual impact associated with a power line and substation:

- The location of the development in the landform setting – i.e. in a valley bottom or on a ridge top. In the latter example the development would be much more visible and would "break" the horizon;
- The presence of macro- or micro-topographical features, built form or vegetation that would screen views of the development from a receptor location;
- The presence of existing, similar features in the area and their alignment in relation to the proposed new development; and
- Temporary factors such as weather conditions (presence of haze, rainfall or heavy mist) which would affect visibility.

In this instance, the proposed power line and substations are intended to serve the proposed Oya Energy Facility and, potentially, other proposed renewable energy facilities (REFs) in the area. As such, the power line and substations will only be built if one (1) of these energy facilities is developed. The power line and substations are therefore likely to be perceived to be part of the greater energy facility development and the visual impact will be relatively minor when compared to the visual impact associated with energy facility as a whole.

The visual impact of lighting on the nightscape is largely dependent on the existing lighting present in the surrounding area at night. The night scene in areas where there are numerous light sources will be visually degraded by the existing light pollution and therefore additional light sources are unlikely to have a significant impact on the nightscape. In contrast, introducing new light sources into a relatively dark night sky will impact on the visual quality of the area at night. It is thus important to identify a night-time visual baseline before exploring the potential visual impact of the proposed development at night.

Much of the study area is characterised by natural areas with pastoral elements and low densities of human settlement. As a result, relatively few light sources are present in the broader area surrounding the proposed development site. The closest built-up area is the town of Touws River which is situated approximately 26km south of Kappa Substation and is thus too far away to have significant impacts on the night scene. At night, the general study area is characterised by a picturesque dark starry sky and the visual character of the night environment is largely 'unpolluted' and pristine. Sources of light in the area are largely limited to isolated lighting from surrounding farmsteads and transient light from the passing cars travelling along the gravel access roads. Some light pollution is however likely to emanate from the operational and security lighting at Kappa substation and Perdekraal WEF and this would reduce the impacts of additional lighting in the area.

Power lines and associated towers or pylons are not lit up at night and, thus light spill associated with the proposed electrical infrastructure project is only likely to emanate from the proposed substations. Although the lighting required at the substation sites would normally be expected to intrude on the nightscape, night time impacts of this lighting will be reduced by the existing light spill emanating from Kappa substation and Perdekraal WEF. It should also be noted that the power line and substations will only be constructed if the proposed Oya Energy Facility (or any other proposed REF in the area) is also developed. Light sources for these facilities will include operational and security lighting and thus the lighting impacts from the proposed substations would be subsumed by the glare and contrast of the lights associated with the energy facility or REFs. As such, the substations alone are not expected to result in significant lighting impacts.

7.2.7.1 Design Phase / Pre-Construction Impacts

No impact occurs during the Design Phase of the project. Nevertheless, measures taken during the Design Phase of the project can potentially have a significant effect on the nature, extent and intensity of impacts experienced during the Construction and Operation Phases.

However, based on the findings of the Visual Specialist, the applicant (Oya Energy) refined layout based on the recommend buffers and 'no-go' areas identified. This is discussed in more detail in **Section 8**.

7.2.7.2 Construction Phase Impacts

Direct Impacts

Direct impacts include the following:

- Large construction vehicles and equipment will alter the natural character of the study area and expose visual receptors to impacts associated with construction.
- Construction activities may be perceived as an unwelcome visual intrusion, particularly in more natural undisturbed settings.
- Dust emissions and dust plumes from increased traffic on the gravel roads serving the construction site may evoke negative sentiments from surrounding viewers.
- Surface disturbance during construction would expose bare soil (scarring) which could visually contrast with the surrounding environment.

- Temporary stockpiling of soil during construction may alter the flat landscape. Wind blowing over these disturbed areas could result in dust which would have a visual impact.

Indirect Impacts

None

7.2.7.3 Operational Phase Impacts

Direct Impacts

Direct impacts include the following:

- The proposed power line and substations could alter the visual character of the surrounding area and expose sensitive visual receptor locations to visual impacts.
- The development may be perceived as an unwelcome visual intrusion, particularly in more natural undisturbed settings.
- Dust emissions and dust plumes from maintenance vehicles accessing the site via gravel roads may evoke negative sentiments from surrounding viewers.
- The night time visual environment will be altered as a result of operational and security lighting at the proposed substations.

Indirect Impacts

None

7.2.7.4 Decommissioning Phase Impacts

Direct Impacts

Direct impacts include the following:

- Vehicles and equipment required for decommissioning will alter the natural character of the study area and expose visual receptors to visual impacts.
- Decommissioning activities may be perceived as an unwelcome visual intrusion.
- Dust emissions and dust plumes from increased traffic on the gravel roads serving the decommissioning site may evoke negative sentiments from surrounding viewers.
- Surface disturbance during decommissioning would expose bare soil (scarring) which could visually contrast with the surrounding environment.
- Temporary stockpiling of soil during decommissioning may alter the flat landscape. Wind blowing over these disturbed areas could result in dust which would have a visual impact.

Indirect Impacts

None

7.3 Overall Impact Assessment: Significance of all Potential Impacts

The impact assessment in **Table 32** is relevant to all alternatives under consideration and is an extension of the impacts discussed above with recommended mitigation measures.

7.4 'No-Go'

7.4.1 Terrestrial 'No-Go'

Please refer to **Table 32** for the results of the assessment of significance of ecological impacts for the proposed development.

7.4.2 Agriculture and Soils 'No-Go'

The 'no-go' alternative considers impacts that will occur to the agricultural environment in the absence of the proposed development. There is no agricultural impact of the 'no-go' option. Therefore, the extent to which the development and the 'no-go' alternative will impact agricultural production are more or less equal, which results in there being, from an agricultural impact perspective only, no preferred alternative between the development and the 'no-go'.

The 'no-go' option is a feasible option. However, it would prevent the proposed development plus the dependent renewable energy developments from contributing to the environmental, social and economic benefits associated with the development of renewable energy.

It should be noted that as part of the Protocol as published in Government Notice No. 648 of 20 March 2020, the specialist was not required to formally rate agricultural impacts. He was only required to indicate whether or not the proposed development will have an unacceptable impact on the agricultural production capability of the site. It must provide a substantiated statement on the acceptability, or not, of the proposed development and a recommendation on the approval, or not of the proposed development.

The conclusion of the assessment was that the proposed development will not have an unacceptable negative impact on the agricultural production capability of the site. The proposed development is therefore acceptable. Refer to section 9.5 of the Agricultural and Soils Compliance Statement as well as the addendum letter (**Appendix 6A**).

7.4.3 Surface Water 'No-Go'

This option would result in no environmental impacts and thus no impacts to the watercourses in the investigation area from the proposed power line and substation development on the site or surrounding local area. Implementing the 'no-go' option would entail no development.

Table 32 provides a summary of the outcome of the impact assessment for the above-listed activities, including mitigation measures, based on the method presented in Appendix D of the Surface Water Impact Assessment Report. All general good housekeeping mitigation measures and the full impact assessment scoring is provided in Appendix F of the Surface Water Impact Assessment Report.

No fatal flaws in terms of freshwater ecological aspects were identified. Should the recommended mitigation measures be implemented with specific mention of only installing pylons outside the delineated extent of the watercourses and its associated 32m NEMA ZoR, a negative low impact significance is expected to occur and therefore it is the opinion of the freshwater specialist that EA may be granted. The mitigation measures as provided in **Table 32** (Table 11 of the Surface Water Impact Assessment Report) have been used as input into the EMPr.

7.4.4 Avifauna 'No-Go'

The 'no-go' alternative will result in the current *status quo* being maintained as far as the avifauna is concerned. The 'no-go' option would eliminate any additional impact on the ecological integrity of the proposed development area as far as avifauna is concerned.

The significance of the avifaunal related impacts associated with the proposed development are detailed in **Table 32**. These impact ratings are applicable across alternatives under consideration.

7.4.5 Socio-Economic "No-Go"

The 'no-go' option would mean that the social environment would not be affected, as the *status quo* would remain intact. The impact of this is that the opportunity to connect the proposed Oya Energy Facility as well as the potential of connecting other nearby developments to the national grid will be lost. This will have a negative social impact, as it will compromise national efforts in ensuring the security of energy supply. In addition, national efforts to reduce Co² emissions through increasing renewable energy capacity would also be compromised without the means of connecting these renewable energy facilities in the area to the National Grid. There would also be no job creation, no revenue streams into the local economy and municipal coffers and a lost opportunity to enhance the national grid with a renewable source of energy.

The significance of the Socio-Economic related impacts mentioned above which are associated with the proposed development are detailed in **Table 32**.

7.4.6 Visual 'No-Go'

The 'no-go' alternative is the option of not developing the proposed project, thus preventing the energy facilities in the area from feeding electricity into the national grid. This alternative would not result in any environmental impacts within the assessment corridors or in the surrounding local area and the *status quo* would remain. This scenario provides the baseline against which other alternatives are compared and will be considered throughout the report.

While the 'no-go' option is a feasible option, it would prevent the proposed development from contributing to the environmental, social and economic benefits associated with the development of the renewables sector.

If the power line and substations not developed in this area, there will be no change in the visual character or the sense of place. There will be no visual impacts on receptors or on the night-time visual environment.

The significance of the visual related impacts mentioned above which are associated with the proposed energy facility are detailed in **Table 32** below. Please refer to Appendix D of the VIA Report for an explanation of the impact rating methodology as well as the addendum letter (**Appendix 6G**).

Table 32: Assessment of identified environmental impacts (all phases) associated with the proposed overhead power line and substations (including associated infrastructure)

ENVIRONMENTAL PARAMETER	ISSUE / IMPACT / ENVIRONMENTAL EFFECT / NATURE	ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION									RECOMMENDED MEASURES	MITIGATION	ENVIRONMENTAL SIGNIFICANCE AFTER MITIGATION								
		E	P	R	L	D	I / M	TOTAL	STATUS (+ OR -)	S			E	P	R	L	D	I / M	TOTAL	STATUS (+ OR -)	S
Construction Phase																					
Direct Impacts																					
Avifauna																					
Avifauna	Displacement of priority species due to habitat destruction in the substation footprint	1	1	3	4	3	1	12	-	Low	A site-specific Construction EMPr (CEMPr) must be implemented, which gives appropriate and detailed description of how construction activities must be conducted to reduce unnecessary destruction and degradation of habitat. All contractors are to adhere to the CEMPr and should apply good environmental practice during construction. The CEMPr should specifically include the following: <ul style="list-style-type: none"> The minimum footprint areas for infrastructure should be used Following construction, rehabilitation of all areas disturbed (e.g. temporary access tracks) must be undertaken and to this end a habitat restoration plan is to be developed by a rehabilitation specialist and implemented accordingly 	1	1	3	4	3	1	12	-	Low	
Avifauna	Displacement of priority species due to disturbance associated with the construction activities	1	3	2	3	1	3	30	-	Medium	<ul style="list-style-type: none"> No off-road driving Maximum use of existing roads Measures to control noise Restricted access to the rest of the property Should Corridor Option 3 or 4 be utilised, the avifaunal specialist should conduct an inspection to see if the Martial Eagle nest on Tower 667 of the Droërvier – Kappa 2 400kV transmission line is active. If the nest is not active, the construction activities can proceed without delay. If the nest is occupied, the avifaunal specialist must consult with the contractor to find ways of minimising the potential disturbance to the breeding pair of eagles during the 	1	2	2	1	1	2	14	-	Low	

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		E	P	R	L	D	I / M	TOTAL	STATUS (+ OR -)	S			E	P	R	L	D	I / M	TOTAL	STATUS (+ OR -)	S						
												construction period. This could include measures such as delaying some of the construction activities until after the breeding season															
Terrestrial Ecology																											
Indigenous natural vegetation	Clearing of vegetation for construction of infrastructure will lead to direct loss and/or fragmentation of indigenous natural vegetation.	1	4	3	3	4	2	30	-	Medium	<ul style="list-style-type: none"> Keep footprint as small as possible by selecting options that affect a smaller overall area of habitat. As far as possible, locate infrastructure within areas that have been previously disturbed or in areas with lower sensitivity scores, taking the ecological sensitivity map into account. Wherever technically possible, avoid sensitive features and habitats when locating infrastructure. Cross streams and other linear features at right angles, where possible, and also near their end-points or where there are natural breaks in the feature of concern. Apply mitigation measures according to assessment by Surface Water Specialist. Where possible, access roads should be located along existing farm, access and district roads, even if these require upgrading. Restrict impact to development footprint only and limit disturbance spreading into surrounding areas. Footprints of construction sites, roads and substation sites should be clearly demarcated. Ensure all possible steps are taken to limit erosion of surfaces, including proper management of storm-water runoff. 	1	4	2	2	4	2	26	-	Medium							

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		E	P	R	L	D	I / M	TOTAL	STATUS (+ OR -)	S			E	P	R	L	D	I / M	TOTAL	STATUS (+ OR -)	S					
												<ul style="list-style-type: none"> Compile a Rehabilitation Plan prior to the commencement of construction. No additional clearing of vegetation should take place without a proper assessment of the environmental impacts and authorization from relevant authorities, unless for maintenance purposes, in which case all reasonable steps should be taken to limit damage to natural areas. No driving of vehicles off-road outside of construction areas. 														
Listed or protected plant species	Direct loss of individuals of protected and/or listed plant species, as well as loss of habitat for these species.	1	4	2	2	3	2	24	-	Medium	<ul style="list-style-type: none"> It is a legal requirement to obtain permits for specimens that will be lost. It is possible that some plants lost to the development can be rescued and planted in appropriate places in rehabilitation areas. Any such measures will reduce the irreplaceable loss of resources as well as the cumulative effect. Note that Search and Rescue is only appropriate for some species and that a high mortality rate can be expected from individuals of species that are not appropriate to transplant. For any plants that are transplanted, annual monitoring should take place to assess survival. This should be undertaken for a period of three years after translocation and be undertaken by a qualified botanist. The monitoring programme must be designed prior to translocation of plants and should include control sites to evaluate mortality relative to wild populations. 	1	4	2	2	2	1	11	-	Low						

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		E	P	R	L	D	I / M	TOTAL	STATUS (+ OR -)	S				E	P	R	L	D	I / M	TOTAL	STATUS (+ OR -)	S	
Faunal habitat and refugia	Direct loss of habitat favourable for various faunal species, including sites where mobile fauna would obtain refuge and sedentary fauna would have permanent homes	1	2	2	2	3	2	20	-	Low	<ul style="list-style-type: none"> Restrict impact to development footprint only and limit disturbance spreading into surrounding areas. Limit clearing of natural habitat designated as sensitive, especially rocky outcrops, cliffs and riparian habitats, where possible. This has already been applied during the Design phase of the project where attempts have been made to avoid sensitive habitats. All mitigation measures that apply to "Loss and/or fragmentation of indigenous natural vegetation" also apply here. 	1	2	2	2	3	1	10	-	Low			
Fauna	Direct mortality due to machinery, construction and/or increased traffic	1	3	1	2	1	1	8	-	Low	<ul style="list-style-type: none"> Access to sensitive areas outside of development footprint should not be permitted during construction. Speed limits should be set for all roads on site, as well as access roads to the site. Strict enforcement of speed limits should occur – install speed control measures, such as speed humps, if necessary. Night driving should be strictly limited and, where absolutely required, lower speed limits should apply for night driving. Pre-construction walk-through in front of construction must be undertaken to move any individual animals, such as tortoises, prior to construction. No dogs or other pets should be allowed on site, except those confined to landowners' dwellings. Personnel on site should undergo environmental induction training, including the need to abide by speed limits, the increased risk of collisions with wild animals on roads in rural areas. Proper waste management must be implemented, ensuring no toxic or dangerous substances are accessible to wildlife. This should also apply to stockpiles of new and used materials to ensure that they do not become a hazard. 	1	2	1	2	1	1	7	-	Low			
Fauna	Displacement of mobile fauna as a result of habitat loss, noise, dust, and general activity.	1	2	2	1	1	1	7	-	Low	<ul style="list-style-type: none"> Restrict impact to development footprint only and limit disturbance spreading into surrounding areas. 	1	2	2	1	1	1	7	-	Low			

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		E	P	R	L	D	I / M	TOTAL	STATUS (+ OR -)	S			E	P	R	L	D	I / M	TOTAL	STATUS (+ OR -)	S	
												<p>will limit edge effects, erosion and sedimentation of the watercourses during the construction phase</p> <ul style="list-style-type: none"> New watercourse road crossings must be kept to a minimum, and may only be developed should existing road crossings not be feasible to use or to circumnavigate the watercourse. The road crossing must be kept as small as possible, only removing the required vegetation and preferably in an area where the channel is lined with solid bed rock (which will not erode) *The reaches of the watercourses where no activities are planned (i.e. no pylons and no spanning of the power line over the watercourse) must be considered no-go areas Contractor laydown areas, vehicle refuelling areas and material storage facilities to remain outside of the watercourses and their associated 32m NEMA ZoR Removed vegetation must be stockpiled outside of the delineated boundary of the watercourse. The footprint areas and height of these stockpiles should be kept to a minimum. Should the vegetation not be suitable for reinstatement after the construction phase or be alien/invasive vegetation species, all material must be disposed of at a registered garden refuse site and may not be burned or mulched on site 										
Agriculture and Soils																						
N/A – refer to section 7.2.2																						
Visual – overhead power line and substation																						

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<ul style="list-style-type: none"> Potential alteration of the visual character and sense of place Potential visual impact on receptors in the study area 	<ul style="list-style-type: none"> Large construction vehicles and equipment will alter the natural character of the study area and expose visual receptors to impacts associated with construction. Construction activities may be perceived as an unwelcome visual intrusion, particularly in more natural undisturbed settings. Dust emissions and dust plumes from increased traffic on the gravel roads serving the construction site may evoke negative sentiments from surrounding viewers. Surface disturbance during construction would expose bare soil (scarring) which could visually contrast with the surrounding environment. Temporary stockpiling of soil during construction may alter the flat landscape. Wind blowing over these disturbed areas could result in dust which would have a visual impact. 	2	3	1	2	1	2	18	-	Low	<ul style="list-style-type: none"> Carefully plan to minimise the construction period and avoid construction delays Inform receptors of the construction programme and schedules Minimise vegetation clearing and rehabilitate cleared areas as soon as possible Vegetation clearing should take place in a phased manner Maintain a neat construction site by removing rubble and waste materials regularly Where possible, underground cabling should be utilised Make use of existing gravel access roads where possible Limit the number of vehicles and trucks travelling to and from the construction site, where possible Ensure that dust suppression techniques are implemented: <ul style="list-style-type: none"> on all access roads in all areas where vegetation clearing has taken place on all soil stockpiles 	2	4	2	2	3	1	13	-	Low	
Heritage, Archaeology, Palaeontology and Cultural Landscapes																					
Impacts to archaeological heritage resources	Construction activities that take place near to archaeological resources may result in their destruction	1	2	4	3	4	3	42	-	Medium	<ul style="list-style-type: none"> 50m buffer area imposed around known archaeological resources 100m buffer area imposed around burial grounds and graves Should any previously unknown archaeological resources be impacted during construction, work must cease in the vicinity of the find and the relevant heritage authority must be contacted 	1	1	4	1	4	1	11	-	Low	
Impacts to palaeontological resources	Construction activities that take place near to palaeontological resources may result in their destruction	1	2	4	3	4	3	42	-	Medium	<ul style="list-style-type: none"> 50m buffer area imposed around known palaeontological resources Implementation of the HWC Chance Fossil Finds Procedure 	1	1	4	1	4	1	11	-	Low	

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		E	P	R	L	D	I / M	TOTAL	STATUS (+ OR -)	S			E	P	R	L	D	I / M	TOTAL	STATUS (+ OR -)	S	
Impacts to the cultural landscape	Construction activities that take place near to cultural landscape elements may result in their destruction	3	3	4	3	4	3	51	-	High	<ul style="list-style-type: none"> 100m buffer area imposed around river confluences 100m buffer around instances where the historic truck road crosses a river 50m buffer around the historic trunk road No-go areas for the Baakesnriver CLA and the Gatsriver CLA Sensitivity regarding significant ridge lines Adoption of the cultural landscape sensitivity guidelines in section 5.4 of HIA Report 	3	2	4	2	4	2	30	-	Medium		
Socio-Economic																						
Health and Social Well-being	Air quality	1	3	1	1	1	1	7	-	Low	Refer to the mitigation measures suggested by the air quality specialist.	1	3	1	1	1	1	7	-	Low		
	Noise	1	1	1	1	1	1	5	-	Low	Refer to the mitigation measures suggested by the noise specialist.	1	1	1	1	1	1	5	-	Low		
	Increase in crime	1	2	3	2	1	2	18	-	Low	<ul style="list-style-type: none"> Ensure that construction workers are identifiable. All workers should carry identification cards and wear identifiable clothing Encourage local people to report any suspicious activity associated with the construction sites through the establishment of a community liaison forum Prevent loitering within the vicinity of the construction camp and construction sites 	1	2	3	2	1	2	18	-	Low		
	Increased risk of HIV infections	3	2	3	3	3	3	42	-	Medium	<ul style="list-style-type: none"> Ensure that an onsite HIV Infections Policy is in place and that construction workers have easy access to condoms Expose workers to a health and HIV/AIDS awareness educational program 	3	2	3	3	3	3	42	-	Medium		
	Influx of construction workers	1	4	1	1	1	1	8	-	Low	<ul style="list-style-type: none"> Communicate the limitation of opportunities created by the project through Community Leaders and Ward Councillors 	1	4	1	1	1	1	8	-	Low		

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		E	P	R	L	D	I / M	TOTAL	STATUS (+ OR -)	S		E	P	R	L	D	I / M	TOTAL	STATUS (+ OR -)	S
	Hazard exposure	2	2	2	2	1	2	18	-	Low	<ul style="list-style-type: none"> Draw up a recruitment policy in consultation with the Community Leaders and Ward Councillors of the area and ensure compliance with this policy Ensure all construction equipment and vehicles are properly maintained at all times. Ensure that operators and drivers are properly trained and make them aware, through regular toolbox talks, of any risk they may pose to the community. Place specific emphasis on the vulnerable sector of the population, such as children and the elderly. Ensure that fires lit by construction staff are only ignited in designated areas and that the appropriate safety precautions, such as not lighting fires in strong winds and completely extinguishing fires before leaving them unattended, are strictly adhered to. Make staff aware of the dangers of fire during regular toolbox talks. 	2	2	2	2	1	2	18	-	Low
Quality of the living environment	Disruption of daily living patterns	2	2	1	2	1	1	8	-	Low	Ensure that, at all times, people have access to their properties and to social facilities	2	2	1	2	1	1	8	-	Low
Economic	Job creation and skills development	2	4	2	2	1	1	11	+	Low	<ul style="list-style-type: none"> Wherever feasible, local residents should be recruited to fill semi and unskilled jobs Women should be given equal employment opportunities and encouraged to apply for positions A skills transfer plan should be put in place at an early stage and workers should be given the opportunity to develop skills which they can use to secure jobs elsewhere post-construction 	2	4	2	2	1	1	11	+	Low

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	Socio-economic stimulation	3	4	2	3	1	1	13	+	Low	A procurement policy promoting the use of local business should, where possible, be put in place to be applied throughout the construction phase.	3	4	2	3	1	1	13	+	Low		
Indirect Impacts																						
Avifauna																						
None																						
Terrestrial Ecology																						
Flora and fauna	Increased poaching and/or illegal collecting due to improved access to previously remote areas.	1	2	2	2	4	2	22	-	Low	<ul style="list-style-type: none"> Personnel to be educated about protection status of species, including distinguishing features, to be able to identify protected species. Implement strict access control for the site. No hunting / collecting of protected species. Report any illegal collection to conservation authorities. 	1	2	2	2	4	1	11	-	Low		
Indigenous natural vegetation	Establishment and spread of declared weeds and alien invader plants due to the clearing and disturbance of indigenous vegetation	1	3	2	3	3	2	24	-	Medium	<ul style="list-style-type: none"> Implement the alien management plan, which highlights control priorities and areas and provides a programme for long-term control. Undertake regular monitoring to detect alien invasions early so that they can be controlled, as per the Alien Management Plan. Implement control measures, as per the Alien Management Plan. 	1	2	2	2	3	1	10	-	Low		
Fauna	Changes to behavioural patterns of animals, including possible migration away or towards the project area	1	2	2	1	1	1	7	-	Low	<ul style="list-style-type: none"> Access to sensitive areas outside of development footprint should not be permitted during construction. Personnel to be educated about environmental sensitivities and issues on site. Appropriate lighting should be installed to minimize impacts on nocturnal animals, as per visual specialist assessment. Construction activities should not be undertaken at night. 	1	2	2	1	1	1	7	-	Low		

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Indigenous natural vegetation	Increased runoff and erosion due to clearing of vegetation, construction of hard surfaces and compaction of surfaces, leading to changes in downslope areas	1	3	2	3	3	2	24	-	Medium	<ul style="list-style-type: none"> Maintain adequate buffer zones around hydrological features so that these do not become degraded from runoff and erosion. Compile and implement a Stormwater Management Plan, which highlights control priorities and areas and provides a programme for long-term control. Undertake regular monitoring to detect erosion features early so that they can be controlled. Implement control measures. Construct proper culverts, bridges and/or crossings at drainage-line crossings, and other attenuation devices to limit overland flow. 	1	2	2	2	3	1	10	-	Low	
Surface Water																					
Watercourse drivers and receptors such as hydrology, water quality (when surface water is present) and geomorphology	Potential indirect impacts caused by site preparation activities (clearing areas for the installation of pylons outside the watercourses and its associated 32mNEMA ZoR) includes the disturbance of the natural buffer area surrounding the watercourses, potentially resulting dust creation, and decrease of surface roughness	1	2	2	2	2	2	18	-	Low	<ul style="list-style-type: none"> It should be feasible to utilise existing roads to gain access to the proposed construction area. No indiscriminate crossing of the watercourses outside of the proposed crossing point or driving in unmarked areas through the buffer zones of the watercourses may be permitted. This will avoid any disturbance to the terrestrial vegetation No other terrestrial vegetation areas may be disturbed by the proposed construction activities for the surface infrastructure, other than the approved proposed footprint areas After construction of the surface infrastructure, the area surrounding the surface infrastructure must be revegetated with suitable indigenous vegetation (terrestrial vegetation) to prevent the establishment of alien vegetation species and their potential spread into the watercourses 	1	1	2	2	2	1	8	-	Low	

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		E	P	R	L	D	I / M	TOTAL	STATUS (+ OR -)	S			E	P	R	L	D	I / M	TOTAL	STATUS (+ OR -)	S
Watercourse drivers and receptors such as vegetation, geomorphology and sediment balance	<p>The installation of the pylons (including mixing and casting of concrete for foundations) and spanning of the proposed power line entails:</p> <ul style="list-style-type: none"> Excavation of pits for the pylons leading to stockpiling of soil Potential movement of construction equipment and personnel in the areas surrounding watercourses <p>This may result in indirect impacts (since no pylons will be located directly within watercourses) such as:</p> <ul style="list-style-type: none"> Disturbances of soils leading to potential impacts to the watercourse vegetation, increased alien vegetation proliferation in the footprint areas, and in turn to altered watercourse habitat Altered runoff patterns, leading to increased erosion and sedimentation of the watercourses 	1	2	2	2	2	2	18	-	Low	<ul style="list-style-type: none"> Excavation of pits for the pylon foundation may result in loose sediments within the landscape, specifically if works are taken during a period of rainfall (if applicable). As such, sediment traps should also be installed downstream/downgradient of the construction area. Sediment traps can be created by pegging an appropriate geotextile across the entire width of the work area at the specified pylon, held down by cobbles/boulders or by geotextile wrapped hay bales spanning the width of the work area and staked into position During excavation of the pits, soils must be stockpiled upgradient of the excavated pit. Mixture of the lower and upper layers of the excavated soil should be kept to a minimum. These soils must be used to close off the pits, immediately after installation of the pylon. The stockpiles must remain as small Protect exposed soils and stockpiles from wind, and limit the time in which soils are exposed, by covering with a suitable geotextile such as hessian sheeting Material used as bedding material (at the bottom of the excavated pit) should be stockpiled outside of the 32m NEMA ZoR and as close as possible to the pylon footprint area. Once the pit has been excavated, the bedding material should directly be placed within the pit, rather than stockpiling it alongside the pit When the power line is spun between the pylons, no vehicles may indiscriminately drive through the 	1	2	2	2	2	1	9	-	Low	

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		E	P	R	L	D	I / M	TOTAL	STATUS (+ OR -)	S		E	P	R	L	D	I / M	TOTAL	STATUS (+ OR -)	S	
												<p>watercourses, use must be made of the dedicated access roads.</p> <p><u>Control measures for concrete mixing on site:</u></p> <ul style="list-style-type: none"> No mixed concrete may be deposited outside of the designated construction footprint As far as possible, concrete mixing should be restricted to the contractor laydown area. Additionally, batter / dagga board mixing trays and impermeable sumps should be provided, onto which any mixed concrete can be deposited while it awaits placing Concrete spilled outside of the demarcated area must be promptly removed and taken to a suitably licensed waste disposal site. <p><u>With regards to backfilling of the concrete encasing</u></p> <ul style="list-style-type: none"> Soils removed for excavating the pit should be used as backfill material All excavated pits must be compacted to natural soil compaction levels to prevent the formation of preferential surface flow paths and subsequent erosion. Conversely, areas compacted as a result of construction activities (within the 5m buffer zone) must be loosened to natural soil compaction levels Any remaining soils following the completion of backfilling of the pits are to be spread out thinly surrounding the installed pylon (outside watercourses) to aid in the natural reclamation process The construction footprint must be limited to the pit area and an additional 5m buffer (to allow for the 									

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		E	P	R	L	D	I / M	TOTAL	STATUS (+ OR -)	S				E	P	R	L	D	I / M	TOTAL	STATUS (+ OR -)	S				
														between 08:30 and 16:30 over weekends.												
	Increase in crime	1	2	3	2	1	2	18	-	Low		<ul style="list-style-type: none"> Ensure that construction workers are identifiable. All workers should carry identification cards and wear identifiable clothing. Encourage local people to report any suspicious activity associated with the construction sites through the establishment of a community liaison forum. Prevent loitering within the vicinity of the construction camp and construction sites. 		1	2	3	2	1	2	18	-	Low				
	Increased risk of HIV infections	3	2	3	3	3	3	42	-	Medium	<ul style="list-style-type: none"> Ensure that an onsite HIV Infections Policy is in place and that construction workers have easy access to condoms. Expose workers to a health and HIV/AIDS awareness educational program. 		3	2	3	3	3	3	42	-	Medium					
	Influx of construction workers	1	4	1	1	1	1	8	-	Low	<ul style="list-style-type: none"> Communicate the limitation of opportunities created by the project through Community Leaders and Ward Councillors. Draw up a recruitment policy in consultation with the Community Leaders and Ward Councillors of the area and ensure compliance with this policy. 		1	4	1	1	1	1	8	-	Low					
	Hazard exposure	2	2	2	2	1	2	18	-	Low	<ul style="list-style-type: none"> Ensure all construction equipment and vehicles are properly maintained at all times. Ensure that operators and drivers are properly trained and make them aware, through regular toolbox talks, of any risk they may pose to the community. Place specific emphasis on the vulnerable sector of the population, such as children and the elderly. 		2	2	2	2	1	2	18	-	Low					

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Quality of the living environment	Disruption of daily living patterns	2	2	1	2	1	1	8	-	Low	<ul style="list-style-type: none"> Ensure that fires lit by construction staff are only ignited in designated areas and that the appropriate safety precautions, such as not lighting fires in strong winds and completely extinguishing fires before leaving them unattended, are strictly adhered to. Make staff aware of the dangers of fire during regular toolbox talks. 	2	2	1	2	1	1	8	-	Low	
Economic	Job creation and skills development	2	4	2	2	1	1	11	+	Low	<ul style="list-style-type: none"> Wherever feasible, local residents should be recruited to fill semi and unskilled jobs. Women should be given equal employment opportunities and encouraged to apply for positions. A skills transfer plan should be put in place at an early stage and workers should be given the opportunity to develop skills which they can use to secure jobs elsewhere post-construction. 	2	4	2	2	1	1	11	+	Low	
	Socio-economic stimulation	3	4	2	3	1	1	13	+	Low	<ul style="list-style-type: none"> A procurement policy promoting the use of local business should, where possible, be put in place to be applied throughout the construction phase. 	3	4	2	3	1	1	13	+	Low	
Operational Phase																					
Direct Impacts																					
Terrestrial Ecology																					
Indigenous natural vegetation	Continued disturbance of indigenous natural vegetation	1	3	2	2	3	2	22	-	Low	<ul style="list-style-type: none"> No additional clearing of vegetation should take place without a proper assessment of the environmental impacts and authorization from relevant authorities, unless for maintenance purposes, in which case all reasonable steps should be taken to limit damage to natural areas. 	1	3	2	2	3	1	11	-	Low	

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													<ul style="list-style-type: none"> No driving of vehicles off-road. Implement Alien Plant Management Plan, including monitoring, to ensure minimal impacts on surrounding areas. Access to sensitive areas outside of development footprint should not be permitted during operation. Surface runoff and erosion must be properly controlled, and any issues addressed as quickly as possible. Continued implementation and monitoring of Rehabilitation Plan. 									
Fauna	Direct mortality due to increased traffic, illegal collecting, poaching and/or entanglement with infrastructure	1	2	2	2	3	2	20	-	Low	<ul style="list-style-type: none"> Personnel and vehicles should be restricted to access; internal roads and no off-road driving should occur. No speeding on access roads – install speed control measures, such as speed humps, if necessary No illegal collecting of any individuals, particularly the Armadillo Girdled Lizard. No hunting of protected species or hunting of any other species without a valid permit. Personnel to be educated about protection status of species, including distinguishing features to be able to identify protected species. Prevent unauthorised access to the site – project roads provide access to remote areas that were not previously easily accessible for illegal collecting or hunting. 	1	2	2	1	3	1	9	-	Low		
Indigenous natural vegetation	Continued runoff and erosion due to presence of hard surfaces that change the infiltration and runoff properties of the landscape.	1	3	2	3	3	2	24	-	Medium	<ul style="list-style-type: none"> Maintain adequate buffer zones around hydrological features so that these do not become degraded from runoff and erosion. Compile and implement a Stormwater Management Plan, which highlights control priorities and 	1	2	2	2	3	1	10	-	Low		

ENVIRONMENTAL PARAMETER	ISSUE / IMPACT / ENVIRONMENTAL EFFECT / NATURE	ENVIRONMENTAL BEFORE MITIGATION									SIGNIFICANCE	RECOMMENDED MITIGATION MEASURES	ENVIRONMENTAL AFTER MITIGATION									SIGNIFICANCE		
		E	P	R	L	D	I / M	TOTAL	STATUS (+ OR -)	S			E	P	R	L	D	I / M	TOTAL	STATUS (+ OR -)	S			
													areas and provides a programme for long-term control. <ul style="list-style-type: none"> Undertake regular monitoring to detect erosion features early so that they can be controlled. Implement control measures. Construct proper culverts, bridges and/or crossings at drainage-line crossings, and other attenuation devices to limit overland flow. 											
Avifauna																								
Avifauna	Mortality of priority species due to electrocutions in the substation yard	1	3	2	4	3	2	26	-	Medium	<ul style="list-style-type: none"> The hardware within the proposed transmission substation yard is too complex to warrant any mitigation for electrocution at this stage. It is recommended that if on-going impacts are recorded once operational, site specific mitigation be applied reactively. This is an acceptable approach because priority avifauna, especially Red Data species, is unlikely to frequent the substation and be electrocuted. 	1	2	2	4	3	1	12	-	Low				
Avifauna	Mortality of priority species due to collisions with the 132kV OHL	1	3	2	4	3	2	26	-	Medium	<ul style="list-style-type: none"> It is recommended that the entire grid connection is marked with BFDs if possible. The operational monitoring programme must include regular monitoring (i.e. quarterly) of the power lines for collision mortalities for at least two (2) years. If additional collision hot-spots are identified during quarterly monitoring, these sections must be marked with BFDs to reduce the collision risk. 	1	2	2	4	3	2	24	-	Medium				
Surface Water																								
None																								
Agriculture and Soils																								
N/A – refer to section 7.2.2																								
Visual – overhead power line and substation																								

ENVIRONMENTAL PARAMETER	ISSUE / IMPACT / ENVIRONMENTAL EFFECT / NATURE	ENVIRONMENTAL BEFORE MITIGATION									RECOMMENDED MEASURES	MITIGATION	ENVIRONMENTAL AFTER MITIGATION								
		E	P	R	L	D	I / M	TOTAL	STATUS (+ OR -)	S			E	P	R	L	D	I / M	TOTAL	STATUS (+ OR -)	S
<ul style="list-style-type: none"> Potential alteration of the visual character and sense of place Potential visual impact on receptors in the study area Potential visual impact on the night time visual environment. 	<ul style="list-style-type: none"> The proposed power line and substations could alter the visual character of the surrounding area and expose sensitive visual receptor locations to visual impacts The development may be perceived as an unwelcome visual intrusion, particularly in more natural undisturbed settings Dust emissions and dust plumes from maintenance vehicles accessing the site via gravel roads may evoke negative sentiments from surrounding viewers The night time visual environment will be altered as a result of operational and security lighting at the proposed substations. 	2	4	2	2	3	1	13	-	Low	<ul style="list-style-type: none"> As far as possible, limit the number of maintenance vehicles using access roads As far as possible, limit the amount of security and operational lighting at the proposed substations Light fittings for security at night should reflect the light toward the ground and prevent light spill Lighting fixtures should make use of minimum lumen or wattage Mounting heights of lighting fixtures should be limited, or alternatively, foot-light or bollard level lights should be used If possible, make use of motion detectors on security lighting Buildings on the substation site should be painted with natural tones that fit with the surrounding environment Non-reflective surfaces should be utilised where possible 	2	4	2	2	3	1	13	-	Low	
Heritage, Archaeology, Palaeontology and Cultural Landscapes																					
Impacts to archaeological heritage resources	Operational activities that take place near to archaeological resources may result in their destruction	1	2	4	3	4	3	42	-	Medium	<ul style="list-style-type: none"> 50m buffer area imposed around known archaeological resources 100m buffer area imposed around burial grounds and graves Should any previously unknown archaeological resources be impacted during construction, work must cease in the vicinity of the find and the relevant heritage authority must be contacted 	1	1	4	1	4	1	11	-	Low	
Impacts to palaeontological resources	Operational activities that take place near to palaeontological resources may result in their destruction	1	2	4	3	4	3	42	-	Medium	<ul style="list-style-type: none"> 50m buffer area imposed around known palaeontological resources Implementation of the HWC Chance Fossil Finds Procedure 	1	1	4	1	4	1	11	-	Low	
Impacts to the cultural landscape	Operational activities that take place near to cultural landscape elements may result in their destruction	3	3	4	3	4	3	51	-	High	<ul style="list-style-type: none"> 100m buffer area imposed around river confluences 100m buffer around instances where the historic truck road crosses a river 50m buffer around the historic trunk road 	3	2	4	2	4	2	30	-	Medium	

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		E	P	R	L	D	I / M	TOTAL	STATUS (+ OR -)	S				E	P	R	L	D	I / M	TOTAL	STATUS (+ OR -)	S			
													<ul style="list-style-type: none"> Implement control measures on an ongoing basis, according to the Alien Management Plan. Do NOT use any alien plants during rehabilitation. 												
Fauna	Changes to behavioural patterns of animals, including possible migration away or towards the project area	1	2	2	1	3	1	9	-	Low	<ul style="list-style-type: none"> Personnel to be educated about environmental sensitivities and issues on site. Appropriate lighting should be installed to minimize impacts on nocturnal animals, as per assessment by visual specialist. Routine maintenance activities should not be undertaken at night. Noise and light pollution should be managed according to guidelines from the noise specialist study and visual specialist assessment respectively. 		1	2	2	1	3	1	9	-	Low				
Avifauna																									
None																									
Surface Water																									
Watercourse drivers and receptors such as vegetation, geomorphology and sediment balance	<p>Operation and maintenance of the power line and substation may result in:</p> <ul style="list-style-type: none"> Potential indiscriminate movement of maintenance vehicles within the watercourses or within close proximity to the watercourses Increased risk of sedimentation and/or hydrocarbons entering the watercourses via stormwater runoff from the access roads <p>The expected impacts may potentially be:</p> <ul style="list-style-type: none"> Disturbance to soils and ongoing erosion as a result of periodic maintenance activities Altered water quality (if surface water is present) as a result of increased availability of pollutants 	1	2	2	2	2	2	18	-	Low	<ul style="list-style-type: none"> Maintenance vehicles must make use of dedicated access roads and no indiscriminate movement in the watercourses may be permitted During periodic maintenance activities of the power line and substation, monitoring for erosion should be undertaken with specific mention investigating the pylons located near areas hosting preferential flow paths Should erosion be noted at the base of the pylon that may potentially impact on a watercourse in the surrounding area, the area must be rehabilitated by infilling the erosion gully and revegetation thereof with suitable indigenous vegetation Monitoring for the establishment for alien and invasive vegetation species must be undertaken, 		1	2	2	2	2	1	9	-	Low				

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		E	P	R	L	D	I / M	TOTAL	STATUS (+ OR -)	S				E	P	R	L	D	I / M	TOTAL	STATUS (+ OR -)	S					
													specifically for access roads through or along the watercourses used to service the power line and substation. Should alien and invasive plant species be identified, they must be removed and disposed of as per an alien and invasive species control plan and the area must be revegetated with suitable indigenous vegetation														
Agriculture and Soils																											
N/A – refer to section 7.2.2																											
Visual – overhead power line and substation																											
None																											
Socio-Economic																											
Health & wellbeing	Electromagnetic fields	1	3	1	3	3	2	22	-	Low	<ul style="list-style-type: none"> Ensure that where ever possible the power line is routed away from areas of high human and animal habitat. Establish a grievance mechanism and deal with grievances transparently. 	1	2	1	3	3	2	20	-	Low							
Quality of the living environment	Transformation of the sense of place	3	4	3	3	3	2	32	-	Medium	<ul style="list-style-type: none"> Apply the mitigation measures suggested in the VIA Report A Grievance Mechanism should be initiated and all grievances should be dealt with transparently The mitigation measures recommended in the HIA and PIA should be followed 	3	4	3	3	3	2	32	-	Medium							
Decommissioning Phase																											
Direct Impacts																											
Terrestrial Ecology																											
Indigenous natural vegetation	Additional disturbance of indigenous natural vegetation	1	3	2	2	2	2	20	-	Low	<ul style="list-style-type: none"> No additional clearing of vegetation should take place without a proper assessment of the environmental impacts and authorization from relevant authorities, unless for maintenance purposes, in which case all reasonable steps should be taken to limit damage to natural areas. No driving of vehicles off-road. 	1	3	2	2	2	1	10	-	Low							

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		E	P	R	L	D	I / M	TOTAL	STATUS (+ OR -)	S			E	P	R	L	D	I / M	TOTAL	STATUS (+ OR -)	S	
													<ul style="list-style-type: none"> Implement Alien Plant Management Plan, including monitoring, to ensure minimal impacts on surrounding areas. Access to sensitive areas outside of development footprint should not be permitted during operation. Surface runoff and erosion must be properly controlled, and any issues addressed as quickly as possible. Continued implementation and monitoring of Rehabilitation Plan. 									
Fauna	Direct mortality due to machinery, decommissioning and/or increased traffic	1	2	2	2	1	1	8	-	Low	<ul style="list-style-type: none"> Personnel and vehicles to avoid sensitive habitats. No speeding on access roads – install speed control measures, such as speed humps, if necessary No illegal collecting of any individuals, particularly the Armadillo Girdled Lizard. No hunting of protected species or hunting of any other species without a valid permit. Personnel to be educated about protection status of species, including distinguishing features to be able to identify protected species. Report any sighting's to conservation authorities. Prevent unauthorised access to the site – project roads provide access to remote areas that were not previously easily accessible for illegal collecting or hunting. 	1	2	2	1	1	7	-	Low			
Indigenous natural vegetation	Negative effects on physiological functioning of vegetation due to dust deposition	2	4	2	2	1	2	22	-	Medium	<ul style="list-style-type: none"> No speeding on access roads – install speed control measures, such as speed humps, if necessary, and penalties for non-compliance. Excessive dust can be controlled by using appropriate dust-control measures. 	2	3	2	2	1	1	10	-	Low		
Avifauna																						

ENVIRONMENTAL PARAMETER	ISSUE / IMPACT / ENVIRONMENTAL EFFECT / NATURE	ENVIRONMENTAL BEFORE MITIGATION									RECOMMENDED MEASURES	MITIGATION	ENVIRONMENTAL AFTER MITIGATION								
		E	P	R	L	D	I / M	TOTAL	STATUS (+ OR -)	S			E	P	R	L	D	I / M	TOTAL	STATUS (+ OR -)	S
Avifauna	Displacement of priority species due to disturbance associated with the decommissioning activities	1	1	3	4	3	1	12	-	Low	<ul style="list-style-type: none"> No off-road driving Maximum use of existing roads Measures to control noise Restricted access to the rest of the property The avifaunal specialist should conduct an inspection to see if the Martial Eagle nest on Tower 667 of the Droërivier – Kappa 2 400kV transmission line is active. If the nest is not active, the decommissioning activities can proceed without delay. If the nest is occupied, the avifaunal specialist must consult with the contractor to find ways of minimising the potential disturbance to the breeding pair of eagles during the decommissioning period. This could include measures such as delaying some of the decommissioning activities until after the breeding season 	1	1	3	4	3	1	12	-	Low	
Surface Water																					
Watercourse drivers and receptors such as hydrology, water quality (when surface water is present), geomorphology, habitat and biota	<p>Potential impacts that may result due to the decommissioning activities:</p> <ul style="list-style-type: none"> Clearing of habitat that has established in previous phases, resulting in a disturbed ecological structure Compaction and disturbance of soils due to decommissioning activities, making the impacted areas unfavourable for the establishment of vegetation and may allow opportunistic alien and invasive species to establish in the nearby watercourses Movement of construction vehicles within the watercourses, disturbing established biota therein 	1	3	2	2	1	3	27	-	Medium	<ul style="list-style-type: none"> No indiscriminate movement of construction equipment in the watercourses and buffer zones surrounding the watercourses may be permitted. Use must be made of the existing roads during the decommissioning phase All surface infrastructure must be decommissioned. All materials must be removed and may temporarily be stockpiled outside the watercourses and its 32m NEMA ZoR, where after is must be removed from site and disposed of at a registered disposal facility Should road crossings be decommissioned, road footprint areas within the watercourse must be levelled to the same level and 	1	2	2	2	1	2	16	-	Low	

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		E	P	R	L	D	I / M	TOTAL	STATUS (+ OR -)	S			E	P	R	L	D	I / M	TOTAL	STATUS (+ OR -)	S									
													<ul style="list-style-type: none"> shape as that of the upstream and downstream reaches. This will ensure a continuous bed level and prevent any concentration of surface flow from occurring Watercourse embankments must be suitably rehabilitated (shaped and revegetated) to prevent any erosion from occurring All infrastructure footprint areas must be ripped and be revegetated within suitable indigenous vegetation species All areas revegetated must be monitored until suitable basal cover has been re-established. Follow up revegetation should take place in areas where initial revegetation is not successful It is recommended that a Watercourse Rehabilitation and Management Plan be compiled and implemented once the layout plan has been finalised. Implementation must be overseen by a suitably qualified Environmental Site Officer (ESO) and the ESO must sign off the rehabilitation before the relevant contractors leave site Post-closure monitoring of the watercourses (for a period of 3 years), with specific mention of the invasion of alien vegetation species) is recommended to be undertaken 																	
Agricultural and Soils																														
N/A – refer to section 7.2.2																														
Visual – overhead power line and substation																														
<ul style="list-style-type: none"> Potential visual intrusion resulting from vehicles and equipment 	<ul style="list-style-type: none"> Vehicles and equipment required for decommissioning will alter the natural character of the study area and expose visual receptors to visual impacts 	2	3	1	2	1	2	18	-	Low	<ul style="list-style-type: none"> All infrastructure that is not required for post-decommissioning use should be removed 	2	2	1	1	1	2	14	-	Low										

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		E	P	R	L	D	I / M	TOTAL	STATUS (+ OR -)	S		E	P	R	L	D	I / M	TOTAL	STATUS (+ OR -)	S			
involved in the decommissioning process <ul style="list-style-type: none"> Potential visual impacts of increased dust emissions from decommissioning activities and related traffic Potential visual intrusion of any remaining infrastructure on the site 	<ul style="list-style-type: none"> Decommissioning activities may be perceived as an unwelcome visual intrusion Dust emissions and dust plumes from increased traffic on the gravel roads serving the decommissioning site may evoke negative sentiments from surrounding viewers Surface disturbance during decommissioning would expose bare soil (scarring) which could visually contrast with the surrounding environment Temporary stockpiling of soil during decommissioning may alter the flat landscape. Wind blowing over these disturbed areas could result in dust which would have a visual impact 											<ul style="list-style-type: none"> Carefully plan to minimize the decommissioning period and avoid delays Maintain a neat decommissioning site by removing rubble and waste materials regularly Ensure that dust suppression procedures are maintained on all gravel access roads throughout the decommissioning phase All cleared areas should be rehabilitated as soon as possible Rehabilitated areas should be monitored post-decommissioning and remedial actions implemented as required 											
Heritage, Archaeology, Palaeontology and Cultural Landscapes																							
Impacts to archaeological heritage resources	Decommissioning activities that take place near to archaeological resources may result in their destruction	1	2	4	3	4	3	42	-	Medium	<ul style="list-style-type: none"> 50m buffer area imposed around known archaeological resources 100m buffer area imposed around burial grounds and graves Should any previously unknown archaeological resources be impacted during construction, work must cease in the vicinity of the find and the relevant heritage authority must be contacted 	1	1	4	1	4	1	11	-	Low			
Impacts to palaeontological resources	Decommissioning activities that take place near to palaeontological resources may result in their destruction	1	2	4	3	4	3	42	-	Medium	<ul style="list-style-type: none"> 50m buffer area imposed around known palaeontological resources Implementation of the HWC Chance Fossil Finds Procedure 	1	1	4	1	4	1	11	-	Low			
Impacts to the cultural landscape	Decommissioning activities that take place near to cultural landscape elements may result in their destruction	3	3	4	3	4	3	51	-	High	<ul style="list-style-type: none"> 100m buffer area imposed around river confluences 100m buffer around instances where the historic truck road crosses a river 50m buffer around the historic trunk road No-go areas for the Baakesnriver CLA and the Gatsriver CLA Sensitivity regarding significant ridge lines Adoption of the cultural landscape sensitivity guidelines in section 5.4 	3	2	4	2	4	2	30	-	Medium			

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		E	P	R	L	D	I / M	TOTAL	STATUS (+ OR -)	S		E	P	R	L	D	I / M	TOTAL	STATUS (+ OR -)	S
Socio-Economic																				
Refer to section 7.4 of Socio-Economic Impact Assessment Report																				
Cumulative																				
Direct Impacts																				
Terrestrial Ecology																				
Indigenous natural vegetation	Clearing of vegetation for construction of infrastructure will lead to direct loss and/or fragmentation of indigenous natural vegetation.	2	4	4	2	4	2.5	40	-	Medium	All projects should adhere to the site-specific recommendations of the ecologists to ensure that all facilities mitigate impacts.	2	4	4	2	4	2	32	-	Medium
Listed or protected plant species	Direct loss of individuals of protected and/or listed plant species, as well as loss of habitat for these species.	2	4	2	2	3	2	26	-	Medium	All projects should adhere to the site-specific recommendations of the ecologists to ensure that all facilities mitigate impacts where possible	2	4	2	2	2	2	24	-	Medium
Landscape ecological processes	Disruption, disturbance, and alteration of landscape ecological processes due to loss of habitat across a number of projects.	2	2	2	3	3	2	24	-	Medium	All projects should adhere to the site-specific recommendations of the ecologists to ensure that all facilities mitigate impacts where possible.	2	2	2	2	2	2	20	-	Low
Critical Biodiversity Areas	Loss, degradation or fragmentation of areas of habitat categorised as CBAs thus leading to reduced effectiveness of Provincial conservation planning.	3	4	3	2	4	2	32	-	Medium	All projects should adhere to the site-specific recommendations of the ecologists to ensure that all facilities mitigate impacts where possible.	3	4	3	2	4	2	32	-	Medium
Surface Water																				
Drainage system habitat integrity and hydrological functioning	<ul style="list-style-type: none"> Loss of watercourse vegetation and subsequent habitat, due to watercourse road crossings and regular movement of vehicles within the surrounding area of the watercourses Changes to flow, pattern and timing of surface water in the drainage system due to land use changes in the catchment (albeit limited due to the limited footprint of a power line and substation), potentially resulting in changes to the hydrological regime of the larger downstream watercourses 	2	3	2	2	3	3	36	-	Medium	<ul style="list-style-type: none"> The mitigation measures pertaining to the grading roads or upgrading of existing informal roads must be adhered to, specifically to avoid erosion and only allow road crossings where authorised Continuous and more frequent use of the roads and movement within the watercourses and surrounding buffer areas during the life of the proposed development may compromise the integrity of the watercourses. As such it is highly recommended that a Watercourse Maintenance and Management Plan (WMMP) be implemented, to avoid any unnecessary impacts and to ensure adequate mitigation of activities that 	2	2	2	2	2	2	20	-	Low

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		E	P	R	L	D	I / M	TOTAL	STATUS (+ OR -)	S				E	P	R	L	D	I / M	TOTAL	STATUS (+ OR -)	S										
													may directly impact on the watercourses, in order to avoid extensive cumulative impacts from occurring. This WMMP must detail:																			
Avifauna																																
Avifauna	Displacement of priority species due to habitat destruction in the substation footprint	1	1	3	4	3	1	12	-	Low		A site-specific Construction EMPr (CEMPr) must be implemented, which gives appropriate and detailed description of how construction activities must be conducted to reduce unnecessary destruction and degradation of habitat. All contractors are to adhere to the CEMPr and should apply good environmental practice during construction. The CEMPr should specifically include the following:	1	1	3	4	3	1	12	-	Low		<ul style="list-style-type: none"> The minimum footprint areas for infrastructure should be used Following construction, rehabilitation of all areas disturbed (e.g. temporary access tracks) must be undertaken and to this end a habitat restoration plan is to be developed by a rehabilitation specialist and implemented accordingly 	1	1	3	4	3	1	12	-	Low
Avifauna	Displacement of priority species due to disturbance associated with the construction activities	1	3	2	3	1	3	30	-	Medium		<ul style="list-style-type: none"> No off-road driving Maximum use of existing roads Measures to control noise Restricted access to the rest of the property The avifaunal specialist must consult with the contractor to find ways of minimising the potential disturbance to breeding eagles on existing HV lines during the construction period. This could include measures such as delaying 	1	2	2	1	1	2	14	-	Low											

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		E	P	R	L	D	I / M	TOTAL	STATUS (+ OR -)	S			E	P	R	L	D	I / M	TOTAL	STATUS (+ OR -)	S	
												some of the construction activities until after the breeding season										
Avifauna	Mortality of priority species due to electrocutions in the substation yard	1	3	2	4	3	2	26	-	Medium		<ul style="list-style-type: none"> The hardware within the proposed transmission substation yard is too complex to warrant any mitigation for electrocution at this stage. It is recommended that if on-going impacts are recorded once operational, site specific mitigation be applied reactively. This is an acceptable approach because priority avifauna, especially Red Data species, is unlikely to frequent the substation and be electrocuted. 	1	2	2	4	3	1	12	-	Low	
Avifauna	Mortality of priority species due to collisions with the 132kV OHL	1	3	2	4	3	2	26	-	Medium		<ul style="list-style-type: none"> The entire OHL should be marked with BFDs. The operational monitoring programme must include regular monitoring (i.e. quarterly) of the powerlines for collision mortalities. 	1	2	2	4	3	2	24	-	Medium	
Avifauna	Displacement of priority species due to disturbance associated with the decommissioning activities	1	1	3	4	3	1	12	-	Low		<ul style="list-style-type: none"> No off-road driving Maximum use of existing roads Measures to control noise Restricted access to the rest of the property The avifaunal specialist must consult with the contractor to find ways of minimising the potential disturbance to breeding eagles on existing HV lines during the decommissioning period. This could include measures such as delaying some of the activities until after the breeding season 	1	1	3	4	3	1	12	-	Low	
Agriculture and Soils																						
N/A – refer to section 7.2.2																						
Visual																						
<ul style="list-style-type: none"> Potential alteration of the visual character and 	<ul style="list-style-type: none"> Additional renewable energy developments in the broader area will alter the natural character of the study area towards a more industrial landscape and 	3	3	2	3	3	2	28	-	Medium		<ul style="list-style-type: none"> Minimise vegetation clearing and rehabilitate cleared areas as soon as possible 	3	3	2	2	2	2	24	-	Medium	

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		E	P	R	L	D	I / M	TOTAL	STATUS (+ OR -)	S		E	P	R	L	D	I / M	TOTAL	STATUS (+ OR -)	S
<p>sense of place in the broader area</p> <ul style="list-style-type: none"> Potential visual impact on receptors in the study area Potential visual impact on the night time visual environment 	<p>expose a greater number of receptors to visual impacts</p> <ul style="list-style-type: none"> Visual intrusion of multiple renewable energy developments may be exacerbated, particularly in more natural undisturbed settings Additional renewable energy facilities in the area would generate additional traffic on gravel roads thus resulting in increased impacts from dust emissions and dust plumes The night time visual environment could be altered as a result of operational and security lighting at multiple renewable energy facilities in the broader area. 										<ul style="list-style-type: none"> Vegetation clearing should take place in a phased manner As far as possible, limit the number of maintenance vehicles using access roads As far as possible, limit the amount of security and operational lighting at the proposed substations Light fittings for security at night should reflect the light toward the ground and prevent light spill Lighting fixtures should make use of minimum lumen or wattage Mounting heights of lighting fixtures should be limited, or alternatively, foot-light or bollard level lights should be used If possible, make use of motion detectors on security lighting Buildings on the substation site should be painted with natural tones that fit with the surrounding environment Non-reflective surfaces should be utilised where possible Ensure that appropriate dust suppression techniques are implemented on all gravel access roads. 									
Heritage, Archaeology, Palaeontology and Cultural Landscapes																				
Impacts to archaeological heritage resources	Cumulative destruction of significant archaeological heritage	1	2	4	3	4	3	42	-	Medium	<ul style="list-style-type: none"> 50m buffer area imposed around known archaeological resources 100m buffer area imposed around burial grounds and graves Should any previously unknown archaeological resources be impacted during construction, work must cease in the vicinity of the find and the relevant heritage authority must be contacted 	1	1	4	1	4	1	11	-	Low
Impacts to palaeontological resources	Cumulative destruction of significant palaeontological heritage	1	2	4	3	4	3	42	-	Medium	<ul style="list-style-type: none"> 50m buffer area imposed around known palaeontological resources Implementation of the HWC Chance Fossil Finds Procedure 	1	1	4	1	4	1	11	-	Low

ENVIRONMENTAL PARAMETER	ISSUE / IMPACT / ENVIRONMENTAL EFFECT / NATURE	ENVIRONMENTAL BEFORE MITIGATION									SIGNIFICANCE	RECOMMENDED MEASURES	MITIGATION	ENVIRONMENTAL AFTER MITIGATION									SIGNIFICANCE
		E	P	R	L	D	I / M	TOTAL	STATUS (+ OR -)	S				E	P	R	L	D	I / M	TOTAL	STATUS (+ OR -)	S	
Impacts to the cultural landscape	Cumulative impact to the cultural landscape	3	3	4	3	4	3	51	-	High	<ul style="list-style-type: none"> 100m buffer area imposed around river confluences 100m buffer around instances where the historic truck road crosses a river 50m buffer around the historic trunk road No-go areas for the Baakesnrivier CLA and the Gatsrivier CLA Sensitivity regarding significant ridge lines Adoption of the cultural landscape sensitivity guidelines in section 5.4 	3	2	4	2	4	2	30	-	Medium			
Socio-Economic																							
Health	Risk of HIV	4	4	4	3	4	3	57	-	High	<ul style="list-style-type: none"> Mitigation can only be implemented at a regional level and will need to be driven on a provincial and municipal basis. In this sense, the following mitigation measures would need to be considered: <ul style="list-style-type: none"> Ensure that all companies coming into the area have, and are, implementing an effective HIV/AIDS policy Introduce HIV/ADS awareness programs to schools and youth institutions Carefully monitor and report on the HIV status of citizens in the region Be proactive in dealing with an increase in the HIV prevalence rate in the area 	4	4	3	3	4	3	54	-	High			
Quality of the living environment	Sense of place	3	4	4	3	4	3	54	-	High	<ul style="list-style-type: none"> Mitigation can only be implemented at a regional level and will need to be driven on a provincial and municipal basis. In this sense, the following mitigation measures would need to be considered: <ul style="list-style-type: none"> Consider undertaking a cumulative impact assessment to evaluate the changes taking place 	3	4	4	3	4	3	54	-	High			

ENVIRONMENTAL PARAMETER	ISSUE / IMPACT / ENVIRONMENTAL EFFECT / NATURE	ENVIRONMENTAL BEFORE MITIGATION									SIGNIFICANCE	RECOMMENDED MEASURES	MITIGATION	ENVIRONMENTAL AFTER MITIGATION									SIGNIFICANCE					
		E	P	R	L	D	I / M	TOTAL	STATUS (+ OR -)	S				E	P	R	L	D	I / M	TOTAL	STATUS (+ OR -)	S						
													<ul style="list-style-type: none"> Establish a social responsibility programme Work closely with the appropriate municipal structures regarding establishing a social responsibility programme Ensure that any trusts or funds are strictly managed in respect of outcomes and funds allocated 															
Indirect Impacts																												
Terrestrial Ecology																												
Fauna	Landscape level impacts on populations of fauna as a result of loss of multiple habitats, changes in behaviour, reduction in range, and migration.	2	3	2	2	3	2	24	-	Medium	<ul style="list-style-type: none"> All projects should adhere to the site-specific recommendations of the ecologists to ensure that all facilities mitigate impacts where possible. 	2	3	2	2	3	2	24	-	Medium								
Indigenous natural vegetation	Degradation of habitat as a result of landscape level increase in the spread of declared weeds and alien invader plants.	2	3	2	3	3	2	26	-	Medium	<ul style="list-style-type: none"> All projects should adhere to the site-specific recommendations of the ecologists to ensure that all facilities mitigate impacts where possible. 	2	2	1	2	3	1	10	-	Low								
Protected fauna	Loss of individuals and populations due to secondary impacts, such as hunting, road kill and illegal collecting	2	3	2	2	3	2	24	-	Medium	<ul style="list-style-type: none"> All projects should adhere to the site-specific recommendations of the ecologists to ensure that all facilities mitigate impacts where possible. 	2	3	2	2	3	2	24	-	Medium								
Avifauna																												
None																												
Surface Water																												
None																												
Agriculture and Soils																												
N/A – refer to section 7.2.2																												
Visual																												
None																												
Socio-Economic																												
Health	Risk of HIV	4	4	4	3	4	3	57	-	High	<ul style="list-style-type: none"> Mitigation can only be implemented at a regional level and will need to be driven on a provincial and municipal basis. In this sense, the following mitigation measures would need to be considered: <ul style="list-style-type: none"> Ensure that all companies coming into the area have, and are, 	4	4	3	3	4	3	54	-	High								

ENVIRONMENTAL PARAMETER	ISSUE / IMPACT / ENVIRONMENTAL EFFECT / NATURE	ENVIRONMENTAL BEFORE MITIGATION									SIGNIFICANCE	RECOMMENDED MEASURES	MITIGATION	ENVIRONMENTAL AFTER MITIGATION									SIGNIFICANCE					
		E	P	R	L	D	I / M	TOTAL	STATUS (+ OR -)	S				E	P	R	L	D	I / M	TOTAL	STATUS (+ OR -)	S						
													implementing an effective HIV/AIDS policy <ul style="list-style-type: none"> ○ Introduce HIV/ADS awareness programs to schools and youth institutions ○ Carefully monitor and report on the HIV status of citizens in the region ○ Be proactive in dealing with an increase in the HIV prevalence rate in the area 															
Quality of the living environment	Sense of place	3	4	4	3	4	3	54	-	High	<ul style="list-style-type: none"> ▪ Mitigation can only be implemented at a regional level and will need to be driven on a provincial and municipal basis. In this sense, the following mitigation measures would need to be considered: <ul style="list-style-type: none"> ○ Consider undertaking a cumulative impact assessment to evaluate the changes taking place across the area on a broader scale ○ Form a regional workgroup tasked with addressing the effect of changes to the sense of place of the region ○ Establish grievance mechanisms to deal with complaints associated with changes to the area ○ Enlighten the public about the need and benefits of renewable energy ○ Engage with the tourism businesses and authorities in the region to identify any areas of cooperation that could exist 	3	4	4	3	4	3	54	-	High								
Quality of the living environment	Service supplies and infrastructure	2	4	2	3	2	2	26	-	Medium	<ul style="list-style-type: none"> ▪ Mitigation can only be implemented at a regional level and will need to be driven on a provincial and municipal basis. In this sense, the following mitigation measures would need to be considered: 	2	4	2	2	2	2	24	-	Medium								

ENVIRONMENTAL PARAMETER	ISSUE / IMPACT / ENVIRONMENTAL EFFECT / NATURE	ENVIRONMENTAL BEFORE MITIGATION									SIGNIFICANCE	RECOMMENDED MITIGATION MEASURES	ENVIRONMENTAL AFTER MITIGATION									SIGNIFICANCE
		E	P	R	L	D	I / M	TOTAL	STATUS (+ OR -)	S			E	P	R	L	D	I / M	TOTAL	STATUS (+ OR -)	S	
												<ul style="list-style-type: none"> Engage with the municipal authorities to ensure that they are aware of the expansion planned for the area and the possible consequences of this expansion Ensure that local labour is recruited in respect of these developments in the area 										
Economic	Positive economic impacts	4	4	3	3	3	4	68	+	Very High	<ul style="list-style-type: none"> Mitigation can only be implemented at a regional level and will need to be driven on a provincial and municipal basis. In this sense, the following mitigation measures would need to be considered: <ul style="list-style-type: none"> Implement a training and skills development programme amongst the local community Ensure that the procurement policy supports local enterprises Establish a social responsibility programme Work closely with the appropriate municipal structures regarding establishing a social responsibility programme Ensure that any trusts or funds are strictly managed in respect of outcomes and funds allocated 	4	4	3	3	3	4	68	+	Very High		
'No-Go' Alternative																						
Direct Impacts																						
Terrestrial Ecology																						
Indigenous natural vegetation	Overgrazing by livestock	1	2	2	2	3	2	20	-	Low	Maintain ecological stocking rates	1	1	1	1	3	1	7	-	Low		
Avifauna																						
N/A																						
Surface Water																						
'No-Go' Alternative (the option of not fulfilling the proposed project)	This option would result in no environmental impacts and thus no impacts to the watercourses in the investigation area from the proposed power line and substation development on the site or surrounding local	1	1	1	1	1	1	5	+	Low	Since no activities will be constructed or operated, no mitigation measures can be applied	1	1	1	1	1	1	5	+	Low		

ENVIRONMENTAL PARAMETER	ISSUE / IMPACT / ENVIRONMENTAL EFFECT / NATURE	ENVIRONMENTAL BEFORE MITIGATION									RECOMMENDED MEASURES	MITIGATION	ENVIRONMENTAL AFTER MITIGATION								
		E	P	R	L	D	I / M	TOTAL	STATUS (+ OR -)	S			E	P	R	L	D	I / M	TOTAL	STATUS (+ OR -)	S
	area. Implementing the no-go option would entail no development																				
Visual																					
<ul style="list-style-type: none"> Potential alteration of the visual character and sense of place in the broader area Potential visual impact on receptors in the study area Potential visual impact on the night time visual environment 	If the 132kV power line and associated substations are not developed in this area, there will be no change in the visual character or the sense of place. There will be no visual impacts on receptors or on the night-time visual environment.	NIL	NIL	NIL	NIL	NIL	NIL	NIL	-	NIL	N/A	NIL	NIL	NIL	NIL	NIL	NIL	-	NIL		
Heritage, Archaeology, Palaeontology and Cultural Landscapes																					
N/A																					
Socio-Economic																					
N/A																					

7.5 Assessment of Cumulative Impacts

The area has seen a notable interest from developers of various renewable energy developments (including their associated power line and substation infrastructure), which could be associated with the energy resource potential found in the region, proximity to the grid access and its evacuation capacity, as well as other factors. Such developments, whether already approved or only proposed, need to be considered as they have the potential to create cumulative impacts, whether positive or negative, if implemented. The potential cumulative impact of the proposed energy facility in combination with other renewable energy facilities (including their associated power line and substation infrastructure) in the area have been identified and assessed per environmental aspect and mitigation measures will be identified to address the cumulative impact, where possible. These projects were identified using the DEFF's Renewable Energy EIA Application Database for SA in conjunction with information provided by IPPs operating in the broader region. Cumulative impacts were also rated as part of the impact rating system and used to determine the significance of the impacts (refer to **Table 32** in **section 7.4** above). The available information was factored into the cumulative impact assessment.

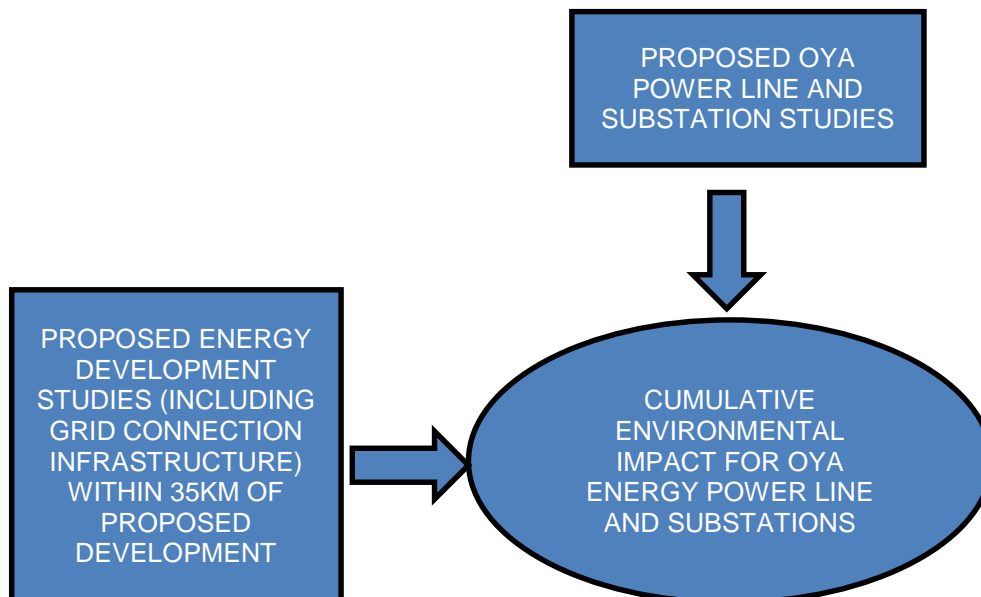


Figure 75: Cumulative Impact Organogram

As part of the cumulative impact assessment, literature reviews of other specialist assessments / studies which were undertaken (where possible) for the other renewable energy developments (both wind and solar), including their grid infrastructure, proposed within a 35km radius of the proposed development site (**Figure 76**) were undertaken by the respective specialists in order to ascertain any additional cumulative impacts that should be taken into consideration. A fair amount of information was available to assess and incorporate into the respective specialist assessment reports, where applicable. **Table 33** below highlights the renewable energy developments (including associated infrastructure) that are being proposed and/or which are approved within a 35km radius of the proposed development site, as well as the various stages of the development. It should be noted that this list is based on information available at the time of writing this report and as such there may be several other renewable energy projects proposed within the study area. Their location relative to the proposed development under review is illustrated in **Figure 76**.

Table 33: Renewable energy developments (including associated grid infrastructure) identified within a 35km radius of the proposed development

Applicant	Project	Technology	Capacity	Status of Application / Development
Oya Energy (Pty) Ltd	Oya Energy Facility	Hybrid	305MW	EIA Process underway
Brandvalley Wind Farm (Pty) Ltd	Brandvalley WEF	Wind	140MW	Approved
Biotherm Energy (Pty) Ltd	Esizayo WEF	Wind	140MW	Approved
African Clean Energy Developments Renewables	Hidden Valley (Karusa & Soetwater) WEF	Wind	140MW	Under Construction
Karreebosch Wind Farm (Pty) Ltd	Kareebosch WEF	Wind	140W	Approved
Rondekop Wind Farm (Pty) Ltd	Rondekop WEF	Wind	325MW	Approved
Kudusberg Wind Farm (Pty) Ltd	Kudusberg WEF	Wind	325W	Approved
South Africa Mainstream Renewable Power Perdekraal West (Pty) Ltd	Perdekraal West WEF & Associated Grid Connection Infrastructure	Wind	150M	Approved
South Africa Mainstream Renewable Power Perdekraal East (Pty) Ltd	Perdekraal East WEF & Associated Grid Connection Infrastructure	Wind	110MW	Operational
Rietkloof Wind Farm (Pty) Ltd	Rietkloof WEF & Associated Grid Connection Infrastructure	Wind	186MW	Approved
Roggeveld Wind Power (Pty) Ltd	Roggeveld WEF & Associated Grid Connection Infrastructure	Wind	140MW	Under Construction
ENERTRAG SA (Pty) Ltd	Tooverberg WEF & Associated Grid Connection Infrastructure	Wind	140MW	Approved

The renewable energy developments listed above are in different stages of planning, ranging from developments that have been authorized (i.e. EAs issued), to developments where the EIA / BA processes are still being conducted and/or underway.

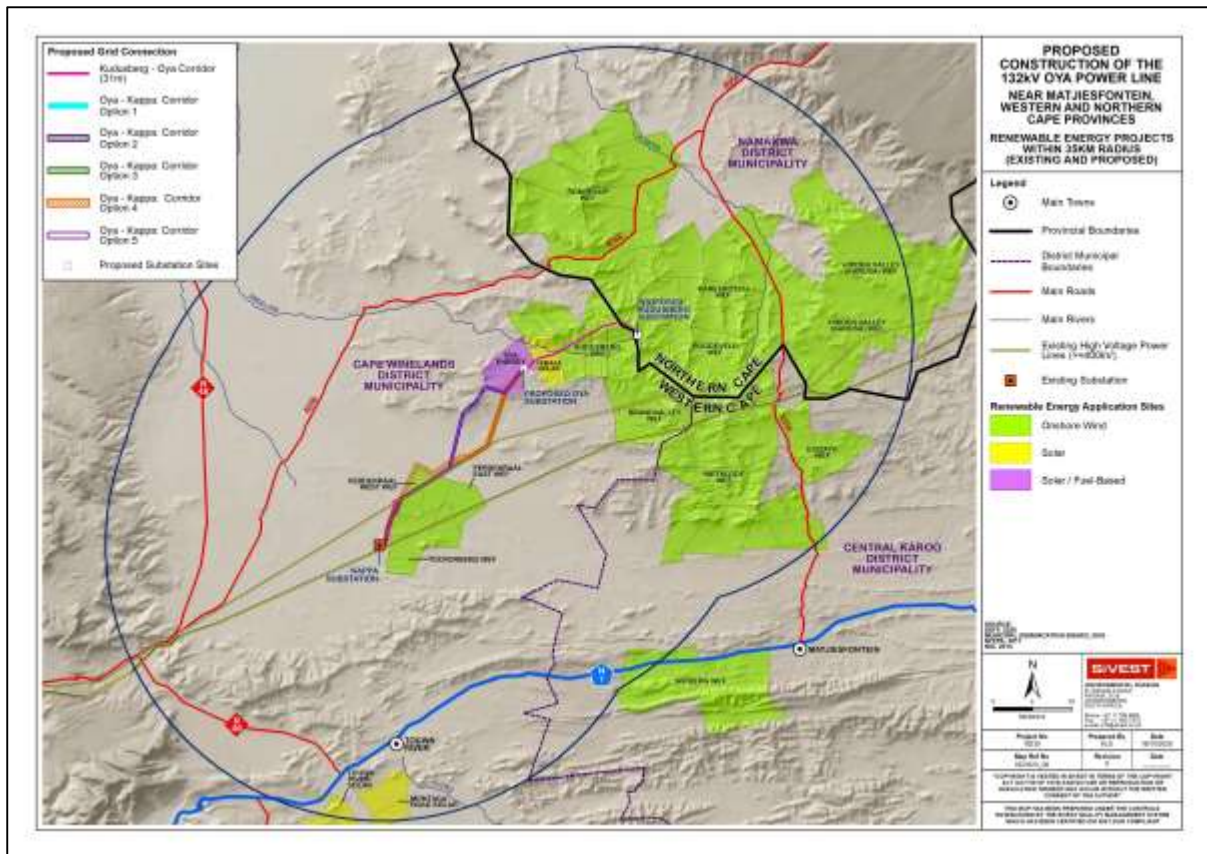


Figure 76: Map showing other proposed renewable energy developments within 35km radius of proposed development

It should be noted that the respective specialists undertook every effort to obtain the information (including specialist studies, BA / EIA / Scoping and EMPr Reports) for the surrounding developments. However, many of the documents are not currently publicly available to download. The information that could be obtained for the surrounding planned renewable energy developments was taken into account as part of the cumulative impact assessment. It should be noted that the cumulative impact assessment is based on information available at the time of writing this report and as such there may be several other renewable energy projects proposed within the study area.

The information (including specialist studies, BA / EIA / Scoping and EMPr Reports) that could be obtained for the surrounding proposed renewable energy sites that were taken into account by the various specialists is elaborated on below.

7.5.1 Terrestrial Ecology

There are 14 projects that cover a fairly broad area, mostly to the north-east of the current project.

Direct Impacts include the following:

- *Cumulative impacts on indigenous natural vegetation*

The projects shown in **Figure 76** are primarily within two vegetation types (although they partially also affect others), namely Koedoesberg-Moordenaars Karoo and Central Mountain Shale Renosterveld. These two regional terrestrial vegetation types in the broad study area are listed as Least Threatened and generally have large areas (47145009 and 12223622ha respectively). Loss of habitat will definitely

occur for each project, each of which will be a small area in comparison to the total area of the vegetation type. The total loss of habitat due to several projects together will be greater than for any single project, so a cumulative effect will occur. However, based on the fact that most of these projects are wind energy projects, which occupy a small footprint relative to the extent of the project, the area lost in total will be small compared to the total area of the vegetation type concerned.

Of more concern is the total degree of fragmentation and/or edge effects due to the combination of all projects, which will be much more significant than gross loss of habitat, measured in hectares. Direct loss of habitat will not result in a change in the conservation status of the vegetation types, but overall degradation due to fragmentation effects is a greater cause for concern. This effect will affect almost the entire extent of Koedoesberg-Moordenaars Karoo and a significant proportion of Central Mountain Shale Renosterveld. The cumulative effect will therefore be low for vegetation loss, but possibly significant for fragmentation.

In addition to habitat loss and habitat fragmentation, the projects are located in a rural area with the little existing infrastructure nearby. The combination of projects will fundamentally change the character of this area in terms of its remoteness and natural state. This has been partially assessed as part of the Visual Impact Assessment as well as the proposed developments location in the Komsberg REDZ. However, this will have an ecological effect that could fundamentally negatively affect plant and animal populations in the region.

- *Cumulative impacts on plant species of concern and protected plant species*

There are various plant species of conservation concern and protected plant species that occur in the study area, most of which are relatively widespread, others of which have a relatively narrow geographical distribution and are relatively rare in the landscape. A distinction is made here between protected species, which are often widespread, and threatened species, which are often rare. Constructing the current project as well as all other renewable energy projects increases the likelihood of individuals being affected, but unless large numbers of individuals are directly affected, there will only be small to moderate cumulative effects on the more common species, possibly a more significant impact on rare species. In principle, no development should allow loss of populations of threatened species, so the assessment undertaken below is for protected species (although effects on threatened species are also discussed).

- *Cumulative impacts on ecological processes*

There are various ecological processes that may be affected at a landscape level by the presence of multiple projects. This includes obvious processes, such as migration, pollination and dispersal, but also more difficult to interpret factors, such as spatial heterogeneity, community composition and environmental gradients, that can become disrupted when landscapes are disturbed at a high level. Disturbance can alter the pattern of variation in the structure or function of ecosystems. Fragmentation is the breaking up of a habitat, ecosystem, or land-use type into smaller parcels. An important consequence of repeated, random clearing is that contiguous cover can break down into isolated patches. This happens when the area cleared exceed a critical level and landscapes start to become disconnected. Spatially heterogenous patterns can be interpreted as individualistic responses to environmental gradients and lead to natural patterns in the landscape. Disrupting gradients and creating disturbance edges across wide areas is very disruptive of natural processes and will lead to fundamental changes in ecosystem function.

- *Cumulative impacts on CBAs and conservation planning*

Significant proportions of the site and surrounding sites are included in Critical Biodiversity Areas for the Western Cape. Disruption of these areas means that conservation planners have to find alternative sites to include in future CBAs according to an algorithm that seeks a least-cost outcome for preserving biodiversity, i.e. the least amount of land space for preserving the greatest amount of area of biodiversity importance, as well as meeting specific conservation targets. At some point, the loss of suitable sites leads to a situation where it is no longer possible to plan effective conservation networks or the cost of doing so increases due to a lack of choice. The higher the density of similar projects in a uniform area, the less chance there is of finding sites suitable for conservation that contain all the attributes that are desired to be conserved, including both ecological processes and ecological patterns. However, at the current stage there is sufficient CBA that can protect these ecological processes while still allowing development to occur as a result this cumulative impact is low.

Indirect Impacts include the following:

- *Cumulative impacts on fauna*

Construction activities, loss of habitat, noise, dust and general activity associated with the construction phase of the project are likely to cause all mobile species to move away from the area. This effect will be increased if there are a number of projects being constructed at the same time or in quick succession, so the effect is likely to be cumulative. However, the geographical ranges of the species of concern is wide and it is considered that the significance of the effect will be low in the long-term, although probably significant during the combined construction phase of the projects. It is possible that some species will be more significantly negatively affected than others, especially shy species, territorial species that get displaced, or those with large territories that get shrunk. It is also possible that some species will benefit from the increased presence of humans and will migrate into the area. This will possibly cause additional shifts in other species that are affected by the increase in numbers or new species.

- *Cumulative impacts due to spread of declared weeds and alien invader plants*

There is a moderate possibility that alien plants could be introduced to areas within the footprint of the proposed infrastructure from surrounding areas in the absence of control measures. The greater the number of projects, the more likely this effect will happen; therefore, the effect is cumulative. For the current site, the impact is predicted to be low due to the current absence of invasive species on site and the high ability to control any additional impact. The significance will therefore be low, especially if control measures are implemented. However, the increased overall disturbance of the landscape will create opportunities and, if new invasions are not controlled, can create nodes that spread to new locations due to the heightened disturbance levels.

- *Cumulative impacts due to loss of protected animals*

There are various animal species protected according to National legislation that occur in the geographical area covered by the combined projects. Some of these animals may be vulnerable to secondary impacts, such as hunting, roadkill and illegal collecting (the Armadillo Girdled Lizard may be particularly vulnerable to this). The greater the number of projects, the more likely this effect will happen; therefore, the effect is cumulative. However, in all cases, the geographical distribution of each species is much wider than the combined project areas. The significance will therefore be low, especially if control measures are implemented.

7.5.2 Agriculture and Soils

The cumulative impact of a development is the impact that development will have when its impact is added to the incremental impacts of other past, present or reasonably foreseeable future activities that will affect the same environment. It is important to note that the cumulative impact assessment for a particular project, like what is being done here, is not the same as an assessment of the impact of all surrounding projects. The cumulative assessment for this project is an assessment only of the impacts associated with this project, but seen in the context of all surrounding impacts. It is concerned with this project's contribution to the overall impact, within the context of the overall impact. But it is not simply the overall impact itself.

The most important concept related to a cumulative impact is that of an acceptable level of change to an environment. A cumulative impact only becomes relevant when the impact of the proposed development will lead directly to the sum of impacts of all developments causing an acceptable level of change to be exceeded in the surrounding area. If the impact of the development being assessed does not cause that level to be exceeded, then the cumulative impact associated with that development is not significant.

The potential cumulative agricultural impact of importance is a regional loss (including by degradation) of agricultural land, with a consequent decrease in agricultural production. The defining question for assessing the cumulative agricultural impact is this:

“What level of loss of agricultural land use and associated loss of agricultural production is acceptable in the area, and will the loss associated with the proposed development, when considered in the context of all past, present or reasonably foreseeable future impacts, cause that level in the area to be exceeded?”

Because of the negligible agricultural impact of the proposed development in such an agricultural environment, far more electricity grid infrastructure than currently exists, or is currently proposed, can be accommodated before acceptable levels of change are exceeded. Acceptable levels of change in terms of other types of impact, for example visual impact, would be exceeded long before the levels for agricultural impact became an issue. For the above reasons, the cumulative agricultural impact of the proposed development can confidently be assessed as negligible.

7.5.3 Surface Water

Cumulative impacts are activities and their associated impacts on the past, present and foreseeable future, both spatially and temporally, considered together with the impacts identified in Section 6.4 above. Watercourses within the region are under continued threat due to rapid land use transformation in the surrounding landscape.

The outcome of the Cumulative Impact Assessment is presented in **Table 32**. Direct and indirect impacts to the watercourses resulting from future existing and proposed renewable energy facilities (REF) and associated grid connection infrastructure (**Table 33** and **Figure 76**) include an increase in alien and invasive species entering the watercourses due to regular disturbance of soils and removal of indigenous vegetation. This results in greater inputs of sediment, and nutrients from runoff that are of higher concentrations in surface runoff which enters the larger drainage systems. The impacts on the watercourses associated with the proposed development are likely to add to the cumulative impact on the loss of freshwater habitat within the region, specifically given the proposed REFs (including associated power lines) within a 35km radius of the proposed development (**Table 33**). Since no pylons and substation sites as part of the proposed development are likely to encroach on the watercourses (as it is assumed that the pylons and substations will be located outside the delineated extent of

watercourses and its 32m NEMA ZoR) and the grading of existing road crossings will result in direct impact, the contribution to the cumulative impacts are deemed Negative Low with the implementation of the recommended mitigation measures (refer to **Table 32**).

Most anticipated impacts to the watercourses associated with the proposed development are indirect, with the exception of the road upgrading/new road development activities for watercourse road crossings. With management and mitigation measures implemented during the construction phase and monitoring of alien and invasive plant species in the watercourses the impacts from the proposed development can further be reduced, thus no significant cumulative contribution to the above mentioned impacts is considered likely.

It is important to note however that the study area is located within the REDZ 2, known as Komsberg REDZ, and also within a Strategic Transmission Corridor and thus the relevant authorities support the concentration of renewable energy developments and associated power line infrastructure in this area.

7.5.4 Avifauna

Although it is important to assess the potential avifaunal impacts of the proposed power line and substations specifically, it is equally important to assess the potential avifaunal visual impact that could materialise if other renewable energy facilities (both wind and solar facilities) with associated power line infrastructure projects are developed in the broader area. Cumulative impacts occur where existing or planned developments, in conjunction with the proposed development, result in significant incremental changes in the broader study area. In this instance, such developments would include renewable energy facilities with associated power line infrastructure development.

Fifteen (15) renewable energy projects were identified within a 35km radius of the proposed development as shown in **Figure 76** and **Table 33**. These projects were identified using the DEFF's Renewable Energy EIA Application Database for SA in conjunction with information provided by IPPs operating in the broader region. It is assumed that all of these renewable energy developments include grid connection infrastructure, although few details of this infrastructure were available at the time of writing this report. It should be noted that this list is based on information available at the time of writing this report and as such there may be other renewable energy projects proposed within the study area.

It is important to note however that the study area is located within the REDZ 2, known as Komsberg REDZ, and also within a Strategic Transmission Corridor and thus the relevant authorities support the concentration of renewable energy developments and associated power line infrastructure in this area.

The most significant impact of the proposed OHL and all the other grid connections associated with the renewable energy facilities within the 35km radius around the current project, is the potential for priority species mortality through collisions. The impacts of electrocution and displacement associated with the proposed substations are relatively minor compared to the envisaged collision impacts. This is especially relevant for large terrestrial species, particularly Ludwig's Bustard, which is highly susceptible to power line collisions. The proposed Kudusberg – Oya – Kappa OHL will add approximately 47- 50km of HV line to the existing HV network in the area, depending on which alignment is ultimately used. Several hundred kilometres of HV line already exists within this area, and several more are planned, should the renewable energy projects all be built. The overall cumulative impact of the proposed development, when viewed with the impacts of existing HV lines on avifauna, and the potential impacts of the grid connections and substations of the planned renewable energy facilities, is assessed to be of medium significance. It could be reduced to some extent with mitigation but will remain at a medium level, specifically as far as power line collision are concerned.

Direct Impacts include the following:

- Displacement of priority species due to habitat destruction in the substation footprint
- Displacement of priority species due to disturbance associated with the construction activities
- Mortality of priority species due to electrocutions in the substation yard
- Mortality of priority species due to collisions with the 132kV OHL
- Displacement of priority species due to disturbance associated with the decommissioning activities

No Indirect Impacts were identified.

Table 32 provides the rating of identified cumulative impacts.

7.5.5 Heritage, Archaeological, Palaeontological and Cultural Landscapes

At this stage, there is the potential for the cumulative impact of the proposed OHL and substation infrastructure in conjunction with the proposed renewable energy facilities and their associated grid infrastructure (power lines and substations) in the immediate area to negatively impact the cultural landscape due to a change in the landscape character from natural wilderness to semi-industrial. Based on the available information, a number of renewable energy facilities and their associated grid infrastructure (power lines and substations) have been approved in the immediate vicinity of the proposed OHL and substation development and it is noted that it is preferable to have renewable energy facility development and its associated infrastructure focused in an area such as a REDZ or Strategic Transmission Corridor.

The cumulative impact of these proposed renewable energy facilities and their associated infrastructure such as the proposed OHL and substation development has the potential to negatively impact on the Cultural Landscape, as well as the distribution and integrity of archaeological and palaeontological resources. A Landscape Character Assessment conducted for two (2) renewable energy facilities in the area includes five core value lines that underscore heritage significance in the context of the Western Cape (ecologic, aesthetic, historic, social and economic value). Each of these value lines, and the element of landscape character that they support, lead to development criteria or design indicators for the protection and management of its heritage significance which can be applied to the OHL and substation development. The design criteria detailed below are not project specific and are proposed as general measures to mitigate against negative cumulative impacts to the significant Karoo Cultural Landscape. These design criteria are summarised below:

- **Ecological Criteria:**
 - Most of the area is prized for the fact that its natural character is retained, and that the landscape therefore still performs a range of biodiversity and ecological functions. Species and ecosystem loss should be prevented by limiting fragmentation in the landscape, and should therefore adhere to the following:
 - Remaining areas of endemic and endangered natural vegetation should be conserved.
 - Critical Biodiversity Areas, and Ecological Support Areas (along drainage lines), should be protected from development of the wind turbines.
 - Areas of critical biodiversity should be protected from any damage during construction; where indigenous and endemic vegetation should be preserved at all cost.

- Areas of habitat are found among the rocky outcrops and contribute to the character, as well as biodiversity of the area. Care should be taken that habitats are not needlessly destroyed.
- No pylons should be allowed to be placed within the 1:100-year flood line of the Groot, and Adamskraal
- river. In the context of the Karoo with its destructive 1:100-year flood events that can irreversibly alter the character, as well as ecological workings of the ESA, would be a risk.
- Careful planning should incorporate areas for stormwater runoff where the base of the structure disturbed the natural soil. Local rocks found on the site could be used to slow stormwater (instead of concrete, or standard edge treatments), and prevent erosion that would be an unfortunate consequence that would alter the character of the site. By using rocks from site, it helps to sensitively keep to the character.
- Renosterveld, and in this case, the Matjiesfontein Shale Renosterveld is found in the mid-elevations and should be kept free from development. Renosterveld is classified as a threatened ecosystem, only found within the boundaries of South Africa. Care should be taken that we do not needlessly destroy our rare resources that determine the character of the karoo landscape, and often on the mid-slopes.
- The principle of ‘tread lightly’ must be applied for any activity (and associated development requirements e.g. toilets for the construction process) should be emphasised.

Aesthetic Criteria:

- Encourage mitigation measures (for instance use of vegetation) to ‘embed’ or disguise the proposed
- structures within the surrounding tourism and agricultural landscape at ground level, road edges etc;
- The continuation of the traditional use of material could be enhanced with the use of the rocks on the site as building material. This would also help to embed structures into the landscape that does not have to be standard containers that clutter the landscape.
- Using material found on the site adds to the sense of place and reduces transportation costs of bringing
- materials to site.
- Where additional infrastructure (i.e. roads) is needed, the upgrade of existing roads to accommodate the development should be the first consideration. The local material such as the rocks found within the area could be applied to address stormwater runoff from the road to prevent erosion.
- Infrastructure improvement, including new roads and upgrades to the road network, should be
- appropriate to the rural context (scale, material etc.).
- The layout of the pylons should have an emphasis on place-making, i.e. landscape-related heritage
- considerations, as opposed to standard infrastructure driven requirements;
- Prevent the construction of new buildings / structures on visually sensitive, steep, elevated or exposed
- slopes, ridgelines and hillcrests. Retain the integrity of the distinctive Karoo landscape character;
- Scale and massing should be sensitive to the surrounding Karoo landscape.
- Avoid visual clutter in the landscape by intrusive signage, and the intrusion of commercial, corporate
- development along roads (as seen at the existing Wind Energy compound)).
- The mountains in the study area are landforms vital to its overall landscape character. They enclose the valleys and settlements of heritage significance. Prevent development on visually sensitive mountain

- slopes and ridgelines in order to preserve the continuity of the mountains as a backdrop.
- Avoid development of infrastructure (such as buildings, wind turbines and power lines), on crests or
- ridgelines due to the impact on the visual sensitivity of skylines.
- Retain view-lines and vistas focused on prominent natural features such as mountain peaks or hills (such as Tooverberg), as these are important place-making and orientating elements for experiencing the cultural landscape.

Historic Criteria:

- The integrity of the historic farm werfs should be maintained and protected. Therefore, care should be exercised in the placement of the pylons at least 900m from all werfs and historic farmsteads.
- Names of routes and watercourses that refer to traditional use during the time of the hunter-gatherers and herders, as well as the colonial era in the Cape, should be celebrated. Public access to these sites should be encouraged, and care should be taken to protect these names.
- Traditional planting patterns should be protected by ensuring that existing trees are not needlessly destroyed, as these signify traces of cultural intervention in a harsh environment. These planting patterns include the trees planted around the werfs.
- In some cases, remnant planting patterns (even single trees) uphold the historic character of an area. Interpretation of these landscape features as historic remnants should occur.
- Mountain slopes have been used for traditional practices for many years, and care should be taken that any significant cultural sites, such as burials and veldkos/medicinal plant resources, are not disturbed.
- Farms in the area followed a system of stone markers to demarcate the farm boundaries in the area.
- Where these structures are found on the site, care should be taken that they are not needlessly destroyed, as they add to the layering of the area.
- Where the historic function of a building/site is still intact, the function has heritage value and should be protected.
- Surviving examples (wagon routes, outspans, and commonage), where they are owned in some public or communal way (or by a body responsible for acting in the public interest) and where they are found to be actively operating in a communal way, will have cultural and heritage value and should be enhanced and retained. The historic outspan on the edge of the Groot River is a historic function that is potentially in use / could be in use by the karretjiemense of the karoo, and therefore should be protected as the main access to the site traverse this historic outspan.
- The new roads (especially those that align with historic wagon routes) should display minimum scale designs where possible.
- Maintain traditional movement patterns across rural landscapes or to places of socio-historical value. (a) Avoid privatization or the creation of barriers to traditional access routes. (b) Retain old roadways, which have been replaced by newer roads, for use as recreation trails.
- The site is located adjacent to an old outspan area. Commonages and outspans were located at water points, and these places were likely gathering points before the arrival of colonists and continued to provide communal resources. In the mid-20th century, many old commonages came under the ownership of the Municipality, and have since been rented out to private individuals or organisations.
- The Municipality should facilitate the use of common land in a way that promotes the well-being and quality of life of the public. These sites can play a restorative role within the community, for instance for those who have limited alternative opportunities for recreation.

- Respect existing patterns, typologies and traditions of settlement-making by promoting the continuity of heritage features. These include: (a) indigenous; (b) colonial; and (c) current living heritage in the form of tangible and intangible associations to place.
- Alterations and additions to conservation-worthy structures should be sympathetic to their architectural character and period detailing.
- Respect traditional werf settlement patterns by considering the entire werf as the component of significance. This includes the backdrop of the natural landscape against which it is sited, as well as its spatial structure. Any development that impacts the inherent character of the werf component should be discouraged.

Social Criteria:

- Care should be taken that existing functions such as schools, churches, outspan areas (see criteria for these under historic) are not lost in the development stages, as it fulfils an important function within the cultural landscape.
- The local community around the development should benefit from job opportunities created by the proposed development.

Economic Criteria:

- Sheep or game farming should be allowed to continue below the pylons, or be rehabilitated to increase biodiversity in the area.
- Care should be taken to reduce visual impact from surrounding tourism areas, by following the recommended areas for placement of structures within the site.

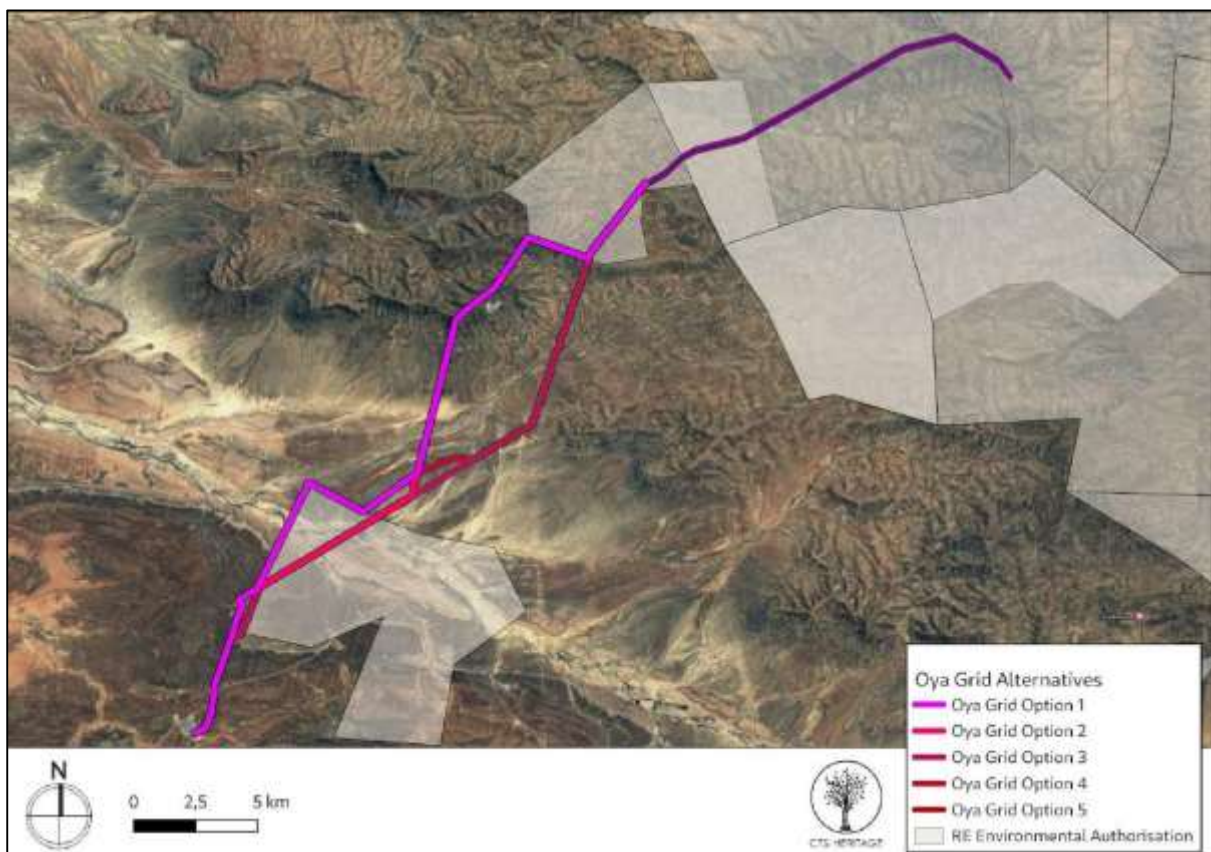


Figure 77: REF projects within the vicinity of the proposed development area

7.5.6 Socio-Economic

The following social issues were raised in the specialist reports pertaining to some of the renewable energy initiatives (including associated grid connections) identified above:

- **Positive impacts**
 - Stimulation of economy
 - Job creation; impacts associated with the construction phase are generally short term
 - Increased demand for services
 - Increased government revenue
 - Skills development
 - Local upliftment initiatives
 - Sustainable household income
 - Establishment of renewable energy infrastructure.
- **Negative impacts**
 - Potential increase in criminal activity
 - Impact on surrounding land uses
 - Sense of place
 - An influx of construction workers
 - Impact on family and community relations – STDs and HIV
 - Risk of stock theft, poaching, and damage to farm infrastructure.
- **Indirect impacts**
 - Skills and development – increased employability
- **Decommissioning Phase**
 - Local economy stimulation
 - Temporary increase in employment and income.
- **Cumulative impacts**
 - Stimulation of economy
 - Impact associated with increases in traffic
 - Development of additional renewable energy facilities – the increased potential for job creation
 - Impact on family and community relations – STDs and HIV
 - Sense of place
 - Pressure on municipal and social services
- **'No-Go' option**
 - Loss of renewable energy infrastructure
 - High carbon emissions
 - Unsustainable way to produce electricity
 - Overall social impact

The details of the reports from which these impacts have been sourced are provided in **Table 34**.

Table 34: List of some SIA reports for projects within a 35km radius

Date	Title of report	Consultant responsible for the report
January 2016	Rietkloof Wind Farm (Pty) Ltd	Tony Barbour Environmental Consulting and Research
January 2016	Brandvalley Wind Farm (Pty) Ltd	Tony Barbour Environmental Consulting and Research
March 2015	Karreeboch Wind Farm (Pty) Ltd	Tony Barbour Environmental Consulting and Research
October 2018	Kudusberg Wind Energy	Urban-Econ Development Economists

October 2020	Oya Energy Facility	Dr Neville Bews & Associates
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In response to the various developments within the Karoo, there has been a counter-reaction amongst some communities opposed to this relatively sudden change to what was previously an isolated, tranquil and pristine environment. In this vein, the Heritage Association of South Africa published an undated appeal to the Department of Environment Forestry and Fisheries to consider the need for a cumulative impact assessment with regard to the cumulative effect of mining and energy developments within the area³⁵. Another article cited in the Karoo News Group appeal is a criticism of the cumulative effects of the renewable energy sector, highlighting environmental questions regarding wind farms³⁶. Apart from the general reaction towards the cumulative effects of renewable energy projects the following more specific social issues need to be considered, these relate to the effects on:

- Risk of HIV;
- Sense of place;
- Service supplies and infrastructure; and
- The economy.

Risk of HIV infections³⁷

With respective HIV prevalence rates of 18.7 and 17.5 percent, both the Western and Northern Cape provinces have the lowest HIV prevalence rates across the country. At a district level, the Cape Winelands has the fifth-lowest HIV prevalence across all districts in South Africa, with a prevalence rate of 15% and most significantly, the Namaqua district has the lowest HIV prevalence rate in the country at 2.3%, followed by the Central Karoo which has the second-lowest HIV prevalence rate in the country at 6.9%. Consequently, the district within which the project is located, and the neighbouring districts, all have the lowest HIV prevalence rates across the country.

These figures are significantly low compared to other areas of the country which range from a rate of 20.3% in Limpopo and 40.1% in KwaZulu-Natal with the iLembe District Municipality having an HIV prevalence rate of 45.9% in 2013. The provinces sharing common borders with the Western and Northern Cape Provinces all have relatively high HIV prevalence rates as indicated below:

- North West = 28.2%
- Free State = 29.8%;
- Eastern Cape = 31.1%.

With the influx of labour, particularly following the construction of the various renewable energy projects within the region, the risk of HIV infections in the area is likely to rise significantly. It is well documented on both an international and local basis that the construction industry carries a high level of HIV (Meintjes, Bowen, & Root, 2007; Bowen, Dorrington, Distiller, Lake, & Besesar, 2008; Wasie, et al., 2015; Bowen P. , Govender, Edwards, & Cattell, 2016; Kikwasi & Lukwale, 2017; Bowen P. , Govender, Edwards, & Lake, 2018) which can be spread amongst the local communities, particularly through the spread of prostitution that follows the availability of disposable income. It is also well documented on both an international and local level that HIV is also spread by truck drivers (Singh & Malaviya, 1994; Ramjee & Gouws, 2002; Strauss, et al., 2018) and there is likely to be an increase in truck drivers in the area as equipment and material is delivered to the various construction sites.

³⁵ Heritage Association of South Africa: Karoo News Group – Undated, Appeal to Minister. <http://heritagesa.org/wp/2222-2/>

³⁶ Tilting at windmills: Power politics and Wind farms in South Africa. <http://reprobate.co.za/tilting-at-windmills-power-politics-and-wind-farms-in-south-africa/>

³⁷ HIV prevalence rates are at 2013 figures based on The 2013 National Antenatal Sentinel HIV Prevalence Survey, South Africa.

These issues associated with the area being extremely poor and the associated disposable income that will follow the construction workers and truck drivers to the area will heighten the risk of the spread of HIV infections across what is a rather remote region. In this regard, The World Bank (2009, pp. 367-368) had indicated a strong link between infrastructure projects and health as:

“Transport, mobility, and gender inequality increase the spread of HIV and AIDS, which along with other infectious diseases, follow transport and construction workers on transport networks and other infrastructure into rural areas, causing serious economic impacts.”

Sense of place

There is also a concern amongst various interest groups that the proliferation of renewable energy facilities (including associated grid connection), particularly when considered in association with other industrial activities such as mining, will have a significant and negative cumulative social impact on the area³⁸. In this regard issues such as the noise from blades; aesthetic associated with highly visible wind farms, solar parks and mines; the loss of bird and bat life and its effect on tourism; as well as the disruption of social networks have all been cited amongst these concerns. For more project-specific cumulative impacts see the Visual Impact Assessment Report.

This is, however, a complex issue as there are varying opinions in respect of the aesthetic appearance of solar PV facilities and wind farms with some regarding them in a far more positive light than others (Firestone, Bidwell, Gardner, & Knapp, 2018; Schneider, Mudra, & Kozumplíková, 2018; Bergquist, Konisky, & Kotcher, 2020). In a study of public attitudes towards onshore windfarms in south-west Scotland, it was found that many regarded the visual impact of these developments in a positive light. It must, however, be noted that this was linked with community ownership having a positive impact on public attitudes towards wind farm developments in Scotland (Warren & McFadyen, 2010). The same is also likely to be true with regard to solar PV facilities (Carley, Konisky, Atiq, & Land, 2020). A further and important consideration in this regard is of an ethical nature associated with community acceptance and energy justice and raises the question of the incorporation of public acceptance, particularly that of the underrepresented, into energy policy (Roddisa, Carvera, Dallimerb, Normana, & Ziva, 2018, pp. 362-363; Bergquist, Konisky, & Kotcher, 2020).

Services, supplies and infrastructure

With the proliferation of renewable energy facilities in the area, it is quite likely that the local authorities, currently hard-pressed to deliver services, will find it difficult to keep up with this development. The influx of construction workers is likely to place pressure on accommodation and the need for both services and supplies. Sutherland, Matjiesfontein and Laingsburg, being either within or just outside of the 70 km radius of these projects, are likely to bear the brunt of the demand for accommodation, services and supplies. On this basis market demands could inflate costs that may have a negative effect on local communities, particularly the poor, who may be forced to pay higher prices for essential supplies resulting in an escalation of the cost of living in the area. Social services such as medical and educational facilities could also be placed under pressure because of increased demand. Although this may reach its peak during the construction phase it should be mitigated somewhat by the fact that the construction of the various projects will be spread across different timelines, with some projects

³⁸ Amongst others see for instance:

1. Heritage South Africa's Karoo News Group <http://heritagesa.org/wp/2222-2/>
2. Alternative sources of energy for South Africa in various shades of green (Smit, 2011)
3. Social media sites such as the Facebook Karoo Energy Debate <https://www.facebook.com/TheKarooEnergyDebate/>
4. Why the Karoo. (Research Chair in the Sociology of Land, Environment and Sustainable Development. Department of Sociology and Social Anthropology, Stellenbosch University, 2016).

commencing while others reach completion. Where numerous projects are entering construction phase simultaneously, the project companies should engage to align efforts. Employing local people across the various projects and project phases may also assist in reducing the stress placed on services, supplies and infrastructure in the area.

During the operational phases, it is likely that these demands will continue as operational staff take up more long-term residency in the area and are supported by service and maintenance personnel who may spend some time on site on a contractual basis. An influx of temporary maintenance and service workers is likely to last over the operational phase of the projects but is likely to settle within the medium term as the economy adjusts and the municipal authorities can respond to this growth.

Economic

The cumulative economic impact of the project will be both positive and negative. The negative economic impacts, associated with a possible rise in living costs driven by market demand, are considered under the section above. Under this section, the positive economic impacts will be addressed.

From a positive perspective, the proliferation of renewable energy facilities within the region is likely to result in significant and positive cumulative impacts in the area in terms of both direct and indirect job creation, skills development, training opportunities, and the creation of business opportunities for local businesses. In this regard it is indicated in the IPPPP Quarterly Report, as at 31 March 2018, that in respect of South Africa as a whole and through the Independent Power Producers Procurement Programme, “ ..the REIPPPP is targeting broader economic and socio-economic developmental benefits” and that “[t]o date, a total of 48 334 job years have been created for South African citizens, of which 39 312 were in construction and 9 021 in operations” (Independent Power Producer Office, 2020a, p. 37 & 41). In addition to this “[t]he combined (construction and operations) procurement value is projected as R149.9 billion, of which R75.8 billion has been spent to date. For construction, of the R65.7 billion already spent to date, R51.4 billion is from the 64 projects which have already been completed. These 64 projects had planned to spend R50.4 billion. The actual procurement construction costs have therefore exceeded the planned costs by 2% for completed projects” The district and local municipalities within the area have identified renewable energy as a strategic economic opportunity in a region that previously had few such opportunities. This is indicated in the various IDPs and LEDs pertaining to the affected municipalities.

Assessment of cumulative impacts

The cumulative impacts discussed above are assessed in **Table 32**. It must, however, be noted that this assessment is at a superficial level as any in-depth investigation of the cumulative effects of the various developments being planned for the region are beyond the scope of this study as they would require a broad-based investigation on a far larger scale. The assessment of the cumulative impacts takes into consideration the impacts associated with all renewable energy facilities and associated grid connection infrastructure in the area and on this basis; no fatal flaws associated with the cumulative impacts are evident at a social level. It is also important to note that it is not within the capacity of individual developers to address these impacts as they fall within the scope of control of the appropriate authorities.

All impacts as assessed across all project phases above are summarised and a pre- and post-mitigation comparison is presented below in **Table 32**.

7.5.7 Visual

Although it is important to assess the potential visual impacts of the proposed power line and substations specifically, it is equally important to assess the potential cumulative visual impact that could materialise if other renewable energy facilities (both wind and solar facilities) and associated infrastructure projects are developed in the broader area. Cumulative impacts occur where existing or planned developments, in conjunction with the proposed development, result in significant incremental changes in the broader study area. In this instance, such developments would include renewable energy facilities and associated infrastructure development.

Renewable energy facilities have the potential to cause large scale visual impacts and the location of several such developments in close proximity to each other could significantly alter the sense of place and visual character in the broader region. Although power lines and substations are relatively small developments when compared to renewable energy facilities, they may still introduce a more industrial character into the landscape, thus altering the sense of place.

Fifteen (15) renewable energy projects were identified within a 35 km radius of the proposed development as shown in **Figure 76**. These projects were identified using the DEFF's Renewable Energy EIA Application Database for SA in conjunction with information provided by Independent Power Producers (IPPs) operating in the broader region. Three (3) of these projects, namely Touws River Solar, Montagu Solar and Witberg WEF, are all located south of the N1 national route and the Bontberg mountain range. Given the visual divide provided by the mountains, it is not anticipated that these developments will result in any significant cumulative impacts affecting the landscape in the vicinity of the study area.

The remaining twelve (12) projects are listed in **Table 32**. It is assumed that all of these renewable energy developments include grid connection infrastructure, although few details of this infrastructure were available at the time of writing this report. It should be noted that this list is based on information available at the time of writing this report and as such there may be several other renewable energy projects proposed within the study area.

The relatively large number of renewable energy facilities within the surrounding area and their potential for large-scale visual impacts could significantly alter the sense of place and visual character in the broader region, as well as exacerbate the visual impacts on surrounding visual receptors, once constructed.

These renewable energy projects include eleven (11) WEFs and one (1) combined Solar PV and Fuel-based Generator Facility (FBGF). Although the different technologies are expected to have different impacts, all renewable energy developments and associated grid connection infrastructure are relevant as they contribute to the alteration of the visual character of the area.

Figure 78 below shows a concentration of sites proposed for WEF development to the north-east of the application site, and also to the south-west, with many of these being located outside the 5km visual assessment zone. Given the distance from the study area and the hilly topography in the broader area, it is not anticipated that the WEF developments beyond the 5km study area will result in any significant cumulative impacts affecting the landscape or the visual receptors within the power line visual assessment zone.

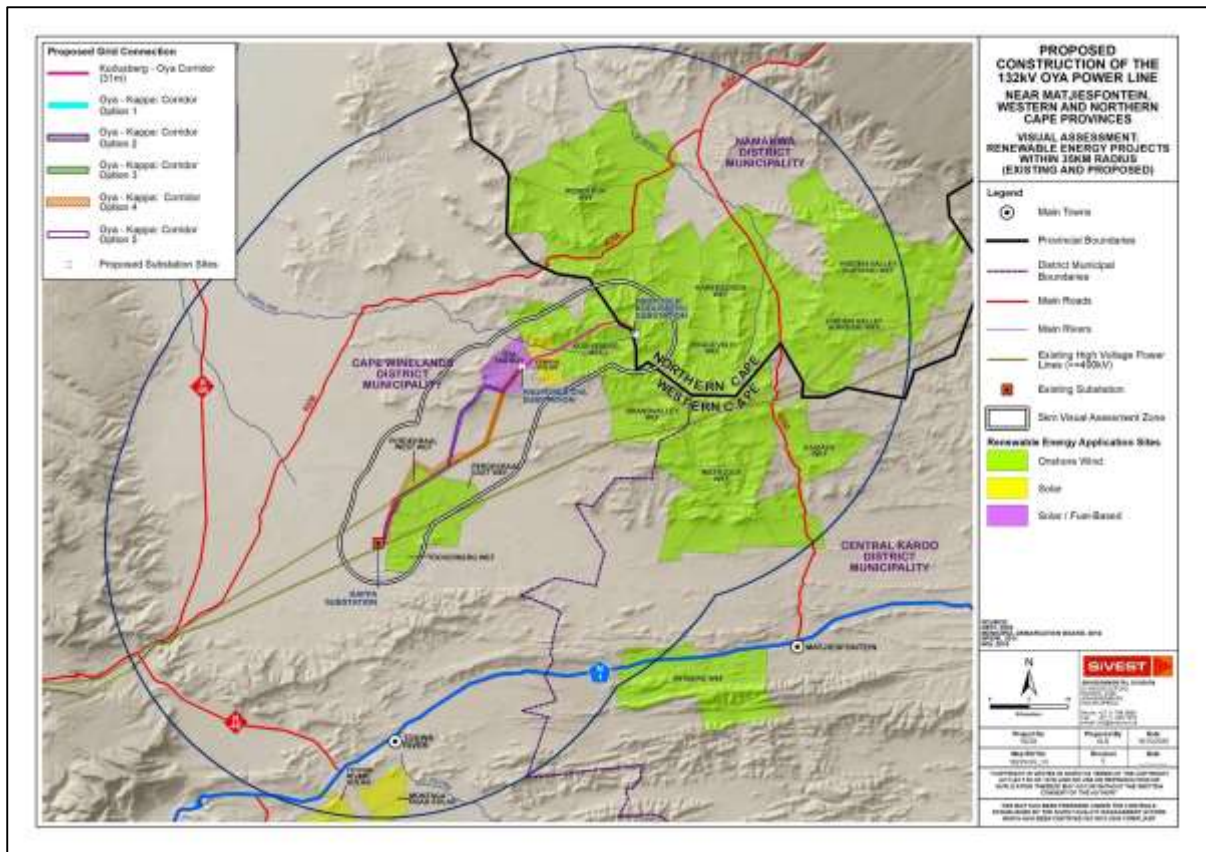


Figure 78: Renewable energy facilities proposed within a 35km radius of the 132kV Oya Power Line

The north-eastern sector of the study area is affected by two (2) renewable energy projects, located on adjoining farm portions, namely Kudusberg WEF and Oya Energy Facility. These projects and associated infrastructure will inevitably introduce an increasingly industrial character into a largely natural, pastoral landscape in this sector of the study area, thus giving rise to significant cumulative impacts. It should be noted however that that PV panels, at an approximate height of 4m, are considerably less visible than wind turbines and as such the proposed Oya solar arrays would be outside the viewshed of many of the potentially sensitive receptor locations identified in the study area. Cumulative impacts affecting these receptors would therefore be reduced and the severity of these impacts would depend on the perceptions of the receptors.

The south-western sector of the study area is affected by three (3) WEF projects, namely Perdekraal East WEF, Perdekraal West WEF and Tooverberg WEF. These projects are all located on adjoining farm portions and are in close proximity to Kappa substation and both sets of high voltage power lines. Grid connection infrastructure for all of these projects include 132kV power lines routed along the same alignment, adjacent to the existing 765kV power lines, traversing the Tooverberg WEF application site to connect into Kappa substation. Although Perdekraal West and Tooverberg WEFs have not yet been developed, Perdekraal East WEF and the associated power line are now operational and the landscape has already undergone noticeable change, which will be exacerbated with further WEF development in the area. Impacts of this transformation will however be reduced by the fact the landscape in the vicinity of these proposed WEF developments has already been disturbed by Perdekraal East WEF, Kappa substation and the existing power lines.

An examination of the literature available for the environmental assessments undertaken for many of these renewable energy applications showed that the visual impacts identified, and the recommendations and mitigation measures provided are largely consistent with those identified in this

report. Where additional, relevant mitigation measures were provided in respect of the other renewable energy applications, these have been incorporated into this report where relevant.

From a visual perspective, the further concentration of renewable energy facilities with associated grid connection infrastructure as proposed will inevitably change the visual character of the area and alter the inherent sense of place, introducing an increasingly industrial character into the broader area, and resulting in significant cumulative impacts. It is however anticipated that these impacts could be mitigated to acceptable levels with the implementation of the recommendations and mitigation measures put forward by the visual specialists in their respective reports.

It is important to note however that the study area is located within the REDZ 2, known as Komsberg REDZ, and also within a Strategic Transmission Corridor and thus the relevant authorities support the concentration of renewable energy developments and associated power line infrastructure in this area. In addition, it is possible that the renewable energy facilities located in close proximity to each other could be seen as one large facility rather than separate developments. Although this will not necessarily reduce impacts on the visual character of the area, it could potentially reduce the cumulative impacts on the landscape

8 LAYOUT ALTERNATIVES

One (1) of the aims of the BA process was to identify alternatives for detailed assessment (as was discussed in **section 3.3**). The selection of alternatives helped to focus investigations, both in terms of the environmental investigations required and the scope of the public participation process.

No site alternatives were considered for the proposed substations as the placement of the substations were determined during the EIA process for the proposed Oya Energy Facility (DEFF Ref No.: [14/12/16/3/3/2/2009](#)) as well as the BA process for the authorised Kudusberg WEF ([14/12/16/3/3/1/1976/AM1](#))³⁹. As mentioned, only one (1) route is possible for the section of the proposed power line which connects the Kudusberg substation to the Oya substation (i.e. Kudusberg to Oya route). No alternatives can therefore be provided for this section of the proposed power line route. The Kudusberg to Oya power line corridor route is approximately 16.6km in length and runs from the Kudusberg substation along the RE/194, 1/158, RE/159, RE/156, 1/156 and RE/155 properties to the Oya substation.

Five (5) power line corridor route alternatives have however been provided for the section of the proposed power line which connects the Oya substation to the Kappa substation (i.e. Oya to Kappa route). The various alternatives, as shown in **Figure 79** below, are described below.

- **Power Line Corridor Alternative 1 (Oya to Kappa):** Approximately 34.14km in length and runs along the RE/155, RE/152, 2/152, RE/169, RE/243, 241, 240 and RE/244 properties to the Kappa substation
- **Power Line Corridor Alternative 2 (Oya to Kappa):** Approximately 32.43km in length and runs along the RE/155, 3/155, RE/152, 2/152, RE/169, 13/168, 5/168, 1/243, RE/243, 241 and 240 properties to the Kappa substation

³⁹ Substations will connect proposed Oya Energy Facility (part of separate on-going EIA process with DEFF Ref No.: [14/12/16/3/3/2/2009](#)) as well as potentially nearby developments into Kappa Substation

- **Power Line Corridor Alternative 3 (Oya to Kappa):** Approximately 30.56km in length and runs along the RE/155, 4/168, 13/168, 5/168, 1/243, 240 and RE/244 properties to the Kappa substation
- **Power Line Corridor Alternative 4 (Oya to Kappa):** Approximately 32.94km in length and runs along the RE/155, 4/168, 13/168, RE/169, RE/243, 241 and 240 properties to the Kappa substation
- **Power Line Corridor Alternative 5 (Oya to Kappa):** Approximately 32.26km in length and runs along the RE/155, RE/152, 2/152, RE/169, 5/168, 1/243 and 240 properties to the Kappa substation

The power line corridors mentioned above provide different route alignments contained within an assessment corridor of up to approximately 300m wide (i.e. 150m on either side of power line). This is to allow for flexibility to route the power line within the authorised corridors.

The findings of the specialist assessments and sensitivity mapping were used to inform the layout of the proposed development. Based on the specialist assessments which were conducted, a few sensitive and/or “no-go” areas have been identified within the study area. These areas were subsequently used to inform the area for the potential erection of the substations and 132kV overhead power line. In addition, these areas were also used to perform a comparison of alternatives, which were extensively investigated. The alternatives were therefore based on both environmental constraints and design factors.

8.1 Comparative Assessment of Alternatives

The proposed substation sites and power line corridor routes were investigated as part of the BA process. In addition, the power line corridor route alternatives for the Oya to Kappa route were comparatively assessed as part of the BA process. The power line corridor route alternatives for the Oya to Kappa route in relation to the environmental sensitive and/or “no-go” areas is shown in **Figure 79** below. Each of these alternatives have been comparatively assessed in terms of the findings from the specialist assessments conducted as part of the BA process.

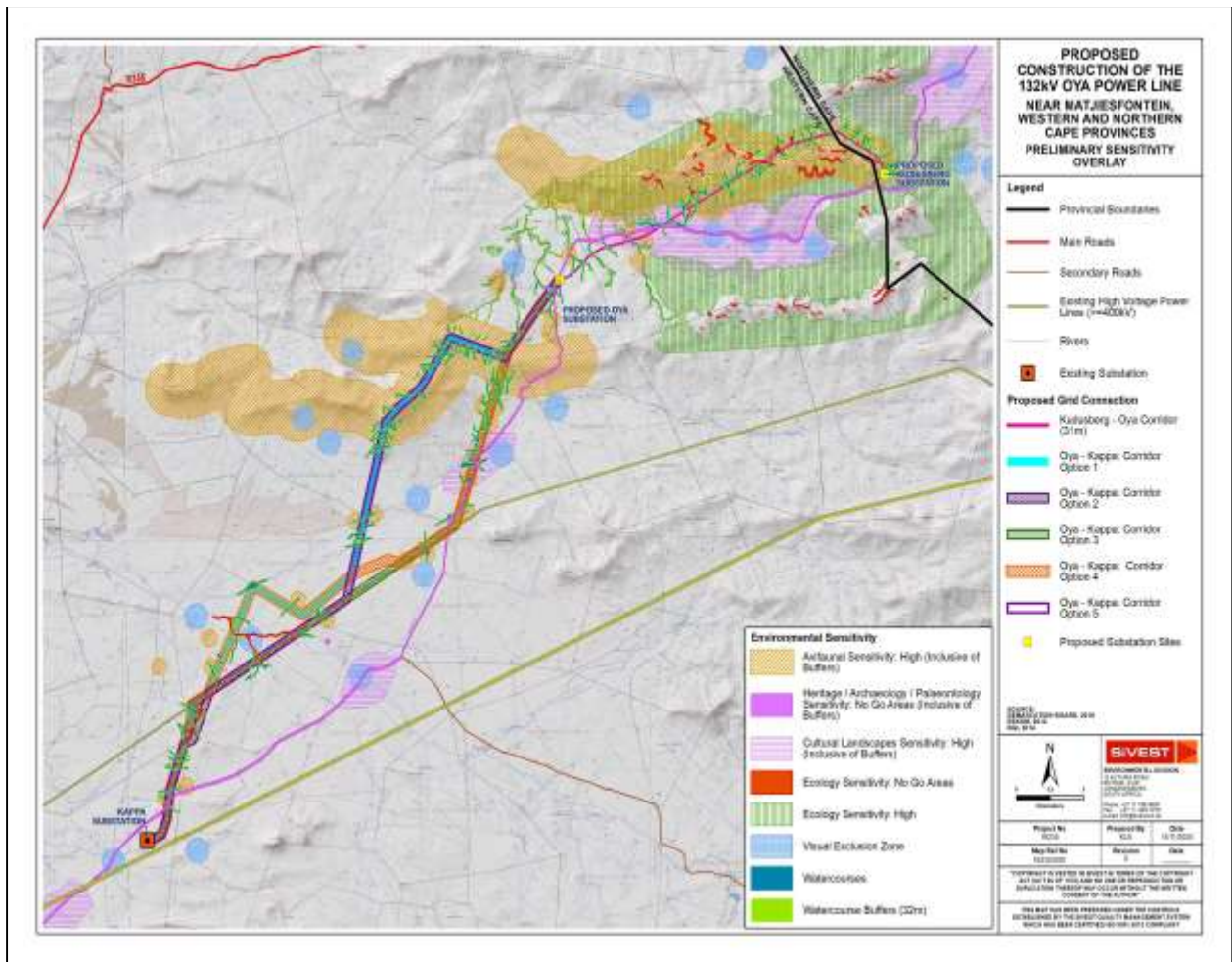


Figure 79: Proposed grid connection infrastructure alternatives in relation to environmental sensitive areas

Table 35 below summarised the preferences associated with each alternative, thereby identifying the preferred alternative.

Key

PREFERRED	The alternative will result in a low impact / reduce the impact
FAVOURABLE	The impact will be relatively insignificant
NOT PREFERRED	The alternative will result in a high impact / increase the impact
NO PREFERENCE	The alternative will result in equal impacts

Table 35: Summary of comparative assessment of alternatives

POWER LINE CORRIDOR ROUTE ALTERNATIVES (OYA TO KAPPA)					
Specialists	Power Line Corridor Alternative 1	Power Line Corridor Alternative 2	Power Line Corridor Alternative 3	Power Line Corridor Alternative 4	Power Line Corridor Alternative 5
Surface Water	No preference	No preference	Preferred	Preferred	No preference
Ecology	Least preferred	Least preferred	Preferred	Favourable	Least preferred
Heritage (including Archaeology, Palaeontology)	Least preferred	Least preferred	Least preferred	Preferred	Least preferred

and Cultural Landscapes)					
Visual	Favourable	Favourable	Preferred	Favourable	Favourable
Socio-Economic	No preference	No preference	No preference	No preference	No preference
Agriculture	Preferred	Preferred	Preferred	Preferred	Preferred
Birds	Least preferred	Favourable	Preferred	Least preferred ⁴⁰	Favourable
Fatal Flaw	No	No	No	No	No
PREFERRED (YES / NO)	-	-	-	YES	-

As depicted in **Table 35** above, **Power Line Corridor Alternative 4 (Oya to Kappa)** was deemed to be the preferred alternative from an environmental perspective **and is being proposed for authorisation**. This is due to the fact that three (3) of the specialists found this alternative to be “Preferred”. These include Aquatic, Heritage (which includes Archaeology, Palaeontology and Cultural Landscapes) and Agriculture. In addition, this alternative was deemed to be “Favourable” from Visual and Terrestrial Ecology perspectives respectively, while the Socio-Economic specialist found this alternative to have “No Preference”⁴¹. The above-mentioned Power Line Corridor Alternative is also preferred from a technical perspective.

In light of the information above, **Power Line Corridor Alternative 4 (Oya to Kappa) is the preferred alternative from an environmental perspective and is being proposed for authorisation**.

As mentioned, no site alternatives were considered for the proposed substation sites as the placement of the substations were determined during the EIA process for the proposed Oya Energy Facility as well as the BA process for the authorised Kudusberg WEF³⁹.

Based on the inputs from the respective specialists regarding the proposed layout (including a comparative assessment of the power line corridor route alternatives), the following alternatives are being proposed for authorisation:

- **Kudusberg to Oya Power Line Corridor Route;**
- **Oya on-site Eskom Substation;**
- **Kudusberg on-site Eskom Substation;** and
- **Power Line Corridor Alternative 4 (Oya to Kappa).**

It is requested that the above-mentioned alternatives, and therefore the proposed layout, be authorised by the DEFF. It must be noted that the specialist sensitivities and “no-go” areas were used to inform the proposed layout, including the location of all alternatives, and have been incorporated into the layout design of the preferred site layout (**Figure 85**). In addition, no fatal flaws were identified and therefore the layout being proposed (including all alternatives) is considered to be acceptable, although not necessarily preferable from an environmental perspective.

⁴⁰ Despite being “Least Preferred”, this alternative was not found to be fatally flawed, as confirmed by the specialist (see **Appendix 6B**)

⁴¹ Avifauna specialist found Power Line Corridor Alternative 4 to be “Least Preferred” as it is the second longest option and only two (2) small sections run next to existing HV lines, and therefore it mostly creates new collision risks where it did not exist before. Despite this, this alternative was not found to be fatally flawed, as confirmed by specialist (see **Appendix 6B**)

The preferred site layout in relation to the sensitive and/or “no-go” areas identified by the specialists is indicated in **Figure 80** below.

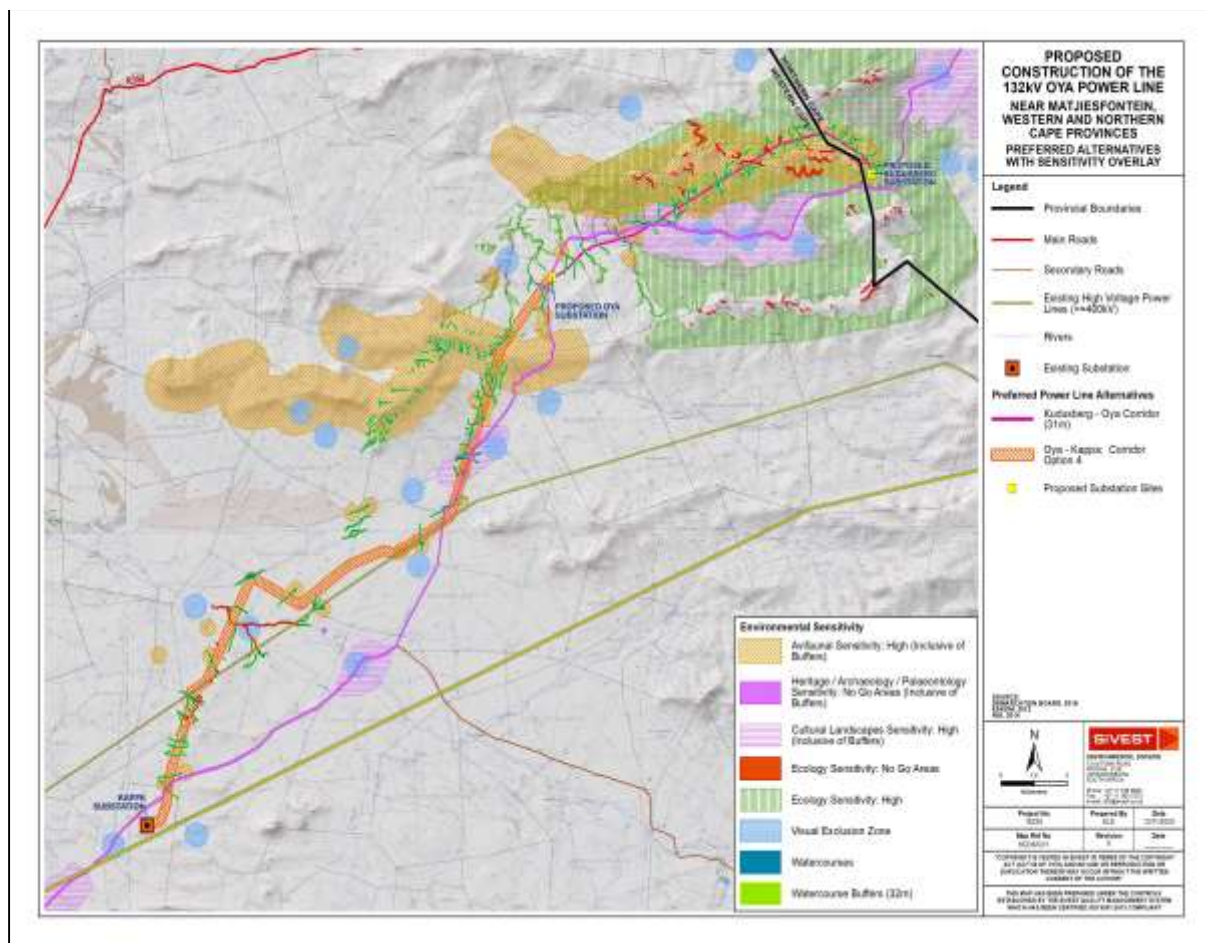


Figure 80: Preferred site layout in relation to identified environmental sensitive / “no-go” areas

Refer to **Appendix 9A** for the coordinates of the preferred site layout.

It is important to note that the preferred layout provided above is the final layout for the proposed development which is being submitted to the DEFF for approval, along with a Final EMPr.

The alignment of the power line within the authorised power line corridors will take the identified sensitive / “no-go” areas into account. This is to enable the avoidance of any unidentified features within the proposed corridors, including those identified as a result of the detailed walkdowns, or any design constraints when the development reaches construction. In addition, routing the power line within the authorised corridors would not be regarded as a change to the scope of work or the findings of the impact assessments undertaken during the BA process. This is based on the understanding that the specialists have assessed the larger area / corridors in detail and all identified sensitive / “no-go” areas have been excluded from the area / corridors, if possible. Therefore, moving the components within the assessed corridors would not change the impact significance. Any changes to the power line route within the boundaries of the authorised corridors following the issuing of the EA (should it be granted) will therefore be considered to be non-substantive.

9 PUBLIC PARTICIPATION PROCESS

Public participation is the cornerstone of any BA process. The principles of NEMA as well as the EIA Regulations, 2014 (as amended), govern the BA process, including public participation. These include provision of sufficient and transparent information on an on-going basis to Interested and/or Affected Parties (I&APs) (**Appendix 7F**) and key stakeholders, such as Organs of State (OoS) / authorities (**Appendix 7I**), to allow them to comment, and to ensure the participation of previously disadvantaged people, women and the youth.

The public participation process is primarily based on two (2) factors:

1. Firstly, on-going interaction with the environmental specialists and the technical teams in order to achieve integration of technical assessment and public participation throughout; and
2. Secondly, to obtain the bulk of the issues to be addressed early on in the process, with the latter half of the process designed to provide environmental and technical evaluation of these issues. These findings are presented to stakeholders for verification that their issues have been captured and for further comment.

The public participation (PP) process is being undertaken in accordance with the requirements of Regulations 39 to 44 of the EIA Regulations, 2014, as amended, (GN R 326).

9.1 Objectives of Public Participation

An understanding of what the public participation is, and is what it is not, needs to be explored and must be clarified.

- Public Participation **is**:
 - A communication mechanism to inform I&APs and key stakeholders regarding a proposed development; and
 - A communication mechanism to record comments and/or concerns regarding a proposed development raised during the relevant phases of the BA process by I&APs and key stakeholders.
- Public Participation is **not**:
 - A marketing exercise;
 - A process to address grievances but rather to record comments and/or concerns raised; and
 - One-on-one consultation with each I&AP and/or key stakeholder during the BA process.

The primary aims of the Public Participation Process are:

- To inform I&APs and key stakeholders of the proposed development;
- To initiate meaningful and timeous participation of I&APs and key stakeholders;
- To identify issues and/or concerns of key stakeholders and I&APs with regards to the proposed development;
- To promote transparency and an understanding of the proposed development and its potential environmental impacts;
- To provide information used for decision-making;
- To provide a structure for liaison and communication with I&APs and key stakeholders;

- To assist in identifying potential environmental impacts associated with the proposed development;
- To ensure inclusivity (the views, needs, interests and values of I&APs and key stakeholders must be considered in the decision-making process);
- To focus on issues relevant to the proposed development and issues considered important by I&APs and key stakeholders;
- To provide responses to I&AP and key stakeholder queries / comments / concerns;
- To encourage co-regulation, shared responsibility and a sense of ownership; and
- Meet the requirements for Public Participation as stated in Chapter 6 of the EIA Regulations, 2014 (as amended).

In addition to the guidance of the Public Participation Process in the EIA Regulations, 2014 (as amended), every effort was also made to conform to the requirements of the Promotion of Administrative Justice Act, 2000 (Act No. 3 of 2000).

9.2 Compliance with Regulations and Subsequent Circulars

In light of the country wide restriction enforced in terms of Government Gazette 43096 which has resulted in the entire country being placed in a national state of disaster and limits on the movement and gatherings of people in an effort to curb the spread CoVID-19, the public participation process has been amended and adjusted in light of these restrictions. In response, SiVEST has formulated a unique Public Participation process which is as closely related to the requirements of Regulations 39 to 44 of the EIA Regulations, 2014, as amended, (GNR 326) as possible.

It should be noted that General Notice issued by the DEFF on 24 March 2020, as well as Government Notice No. 650 issued by the DEFF on 05 June 2020, were being adhered to during Level 3 of the national lockdown period. However, during a meeting held with the South African Wind Energy Association (SAWEA) on 25 August 2020, the DEFF indicated that the Directive issued by the Department on 05 June 2020 (Government Gazette 43412) related to level 3 lockdown, has been repealed, based on the current lockdown level. Therefore, as it stands, there is no indication that a new directive will be issued, and the “normal” EIA Regulations are currently in force. DEFF however highlighted that Applicants must continue to adhere to the applicable provisions of the Disaster Management Act and associated Regulations (e.g. restrictions on gatherings for public meetings) and hence some elements included in the lockdown directive (05 June 2020 - Government Gazette 43412), mainly as it pertains to PPP, are still relevant and that this directive can be used as a consultation guide for all new applications. The Applicant will thus continue to adhere to applicable provisions of Disaster Management Act and associated Regulations.

As a result, **alternative means** of undertaking the required stakeholder engagement have been designed and implemented by SiVEST to ensure that all I&APs are afforded reasonable opportunity to engage meaningfully. As such, SiVEST proposed amendments to the public participation process, described in more detail below. This Public Participation Plan was submitted to DEFF and was subsequently approved on 05 November 2020 and can be found in **Appendix 7J**, along with the subsequent approval.

Figure 81 below provides an overview of the tools that are available to I&APs and stakeholders to access project information and interact with the public participation team to obtain project information and resolve any queries that may arise, and to meet the requirements for public participation. While **Table 36** below shows how the amended PPP has been implemented in accordance to Regulations 39 to 44 of the EIA Regulations, 2014, as amended, (GNR 326), as well as adherence to the applicable

provisions of the Disaster Management Act and associated Regulations (e.g. restrictions on gatherings for public meetings) and hence some elements included in the lockdown directive (05 June 2020 - Government Gazette 43412), mainly as it pertains to PPP.

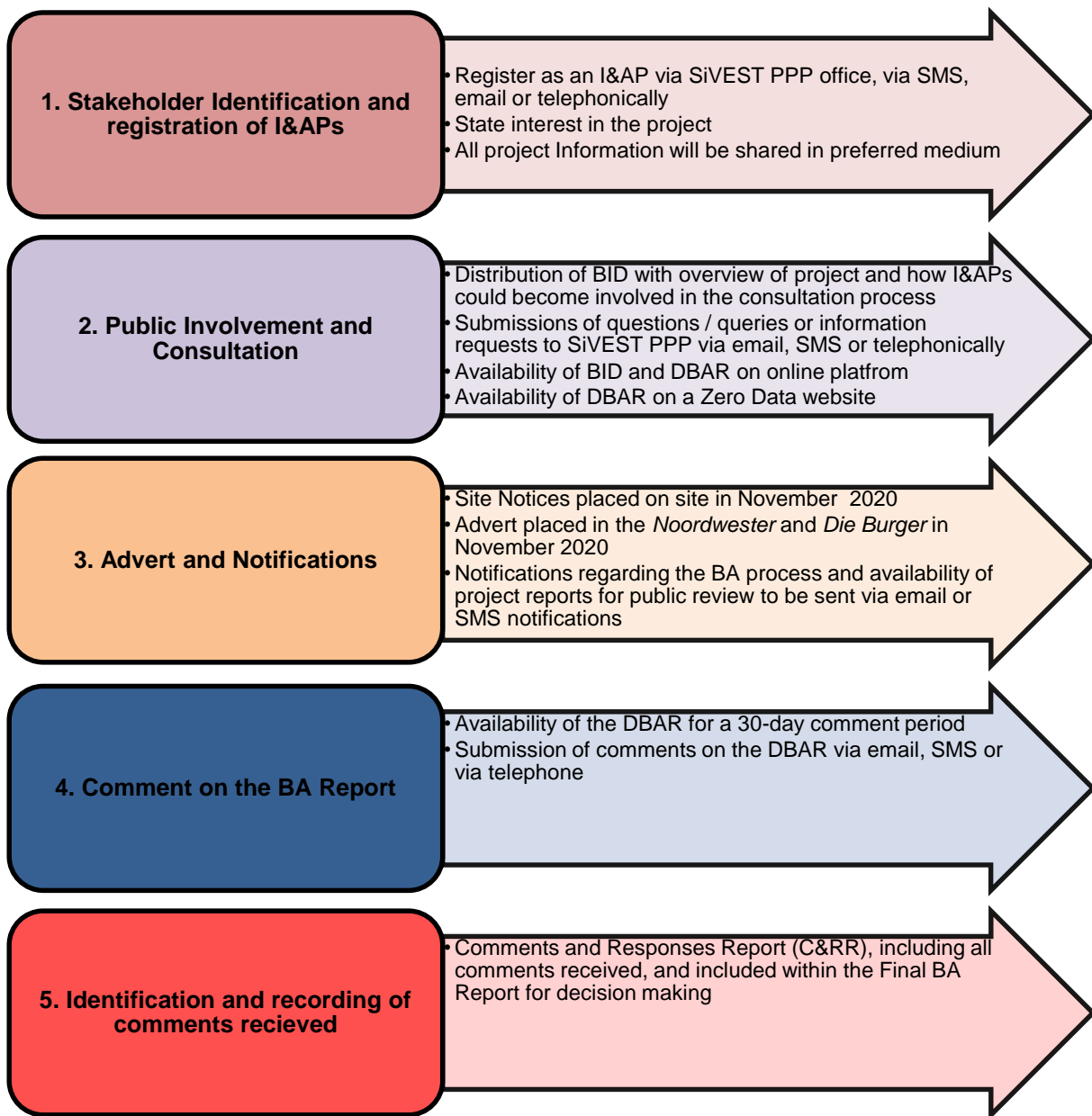


Figure 81: Schematic illustration of PPP tools

Table 36: Public Participation Plan: Discussion of approach and methodology to meet the requirements of the Regulations (Please see **Appendix 7J** for full approved plan)

Regulation/ circular	Approach & Methodology to meet requirements
<p>Regulation 40(1), Regulation 40(3) & Regulation 43 – provide all potential or registered interested and affected parties, including the competent authority, access to project related information, access to the BA report which will be made available for a period of at least 30 days to submit comments on draft reports prior to submission of final reports for decision-making.</p>	<p><u>It is the intention to release all relevant project information to all interested and affected parties for a 30-day period.</u></p> <p>Notification of Basic Assessment (BA) process to be undertaken for application for Environmental Authorisation (EA) to be distributed using the following means:</p> <ul style="list-style-type: none"> • Issuing of the Background Information Document (BID) and initial landowner consultation (to be circulated to all I&APs in November 2020) (proof to be included in Final BA Report). • Placement of site notices in English and Afrikaans (as per regulations) along the entrance road to the Gatsrivier Holiday Farm (an affected property - Portion 5 of the Farm Bantamsfontein No 168) during a site visit undertaken in November 2020 (33° 2'21.54"S, 20° 7'56.99"E). • Notification letter to be sent via E-mail or sms (if cellphone number / email is available, it is assuming the I&AP have an email or cellphone). • ALL identified I&APs has access to at least email or cellphone (Appendix 1 and Appendix 2) • Public notification of the BA process will be advertised in a local newspaper (namely <i>the Noordwester</i>) as well as a Provincial Newspaper (namely <i>Die Burger</i>), as required according to Regulation 41 (2) (c) of the EIA Regulations (2014), as amended. <p>Availability of report for review:</p> <ul style="list-style-type: none"> • Report available on the Oya website for free download. • Dedicated data free portal for online stakeholder engagement platform. • Digital Tablet uploaded with the DBAR at the Sutherland Police Station and Witzenberg Local Municipality offices***. • Electronic copies can be made available to parties via a secure digital link that will be emailed upon request for the documentation. • CDs / Flash drive to be posted, only if requested⁴². • Digital Tablet** uploaded with the DBAR at the Sutherland Police Station and Witzenberg Local Municipality

⁴² The use of postage will only be required should and I&AP request that the documents be sent to them via CD or flash drive. All I&APs and OoS have either email / sms and will be sent an electronic link to the website where the reports can be reviewed or downloaded, as well as a data free portal where the reports can be reviewed. Should any I&APs / stakeholders / Oos request documents via post or courier, this will be indicated and proof will be provided in the BA Report.

Regulation/ circular	Approach & Methodology to meet requirements												
	<p>offices.</p> <p>The tablet will be located at the following location and will be available for review at the below designated time:</p> <table border="1"> <thead> <tr> <th>Locations</th> <th>Address</th> <th>Open Hours</th> <th>Contact**</th> </tr> </thead> <tbody> <tr> <td>Sutherland Police Station</td> <td>21 Piet Retief Street Sutherland</td> <td>8am-5pm for viewing</td> <td>023-5718040</td> </tr> <tr> <td>Witzenberg Local Municipality</td> <td>53 Voortrekker Street, Ceres</td> <td>8am-4pm for viewing</td> <td>023-3168554</td> </tr> </tbody> </table> <p>** In light of the requirements enforced by the Government Gazette 43096 and the limits on the movement and gatherings of people in an effort to curb the spread CoVID-19, Constable Koopman (PSmTis@saps.gov.za) has confirmed that the report will be sanitised after every viewing. There will also be a bottle of hand sanitiser next to the tablet where the user can sanitise themselves and the report as well to prevent the spread of CoVID-19. A site notice will also be placed next to the report detailing the project details and encouraging the public to practice social distance (i.e. one at a time), ensure the wearing of masks and the use of hand sanitiser while viewing the report.</p> <p>** Mr. Hennie Taljaard of the Witzenberg Local Municipality confirmed that he will meet any I&APs wishing to view the digital Tablet in order to explain how the digital Tablet works and to provide assistance (if possible).</p> <p><u>Availability to comment:</u> Comments can be submitted in various mediums detailed in the row below, and will be captured and responded to by the SiVEST PPP Office.</p> <p>***Where I&APs do not have the applicable facilities i.e. access to internet, mobile phones, or computers, provision will be made for the use of an electronic tablets which will contain the full DBAR, where all members of the communities can view the report.</p>	Locations	Address	Open Hours	Contact**	Sutherland Police Station	21 Piet Retief Street Sutherland	8am-5pm for viewing	023-5718040	Witzenberg Local Municipality	53 Voortrekker Street, Ceres	8am-4pm for viewing	023-3168554
Locations	Address	Open Hours	Contact**										
Sutherland Police Station	21 Piet Retief Street Sutherland	8am-5pm for viewing	023-5718040										
Witzenberg Local Municipality	53 Voortrekker Street, Ceres	8am-4pm for viewing	023-3168554										
<p>Regulation 40(2) - Provide access to all project information that has the potential to influence any decision regarding the application, unless protected by law, and must include consultation with Competent Authority, Organs of State & registered I&APs.</p> <p>Regulation 41(6) – Relevant information available and accessible</p>	<ul style="list-style-type: none"> • Report will be submitted to the DEFF using the DEFF online portal. • Report will be submitted to OoS and commenting authorities via an agreed electronic platform (via a secure digital link). <p><u>Availability of report via means described above.</u></p> <p><u>Submission of comments to EAP:</u></p> <ul style="list-style-type: none"> • Comments will be able to be submitted directly to the EAP using the SiVEST sivest_ppp@sivest.co.za email address or cell phone via call, SMS or WhatsApp. • Written comments can also be submitted via email or fax. 												

Regulation/ circular	Approach & Methodology to meet requirements
	<ul style="list-style-type: none"> • This is deemed to be sufficient as all I&APs have either access to email or cellphone. <p>Any comments provided telephonically or via instant message will be transcribed and recorded as formal comments.</p> <p>Provision of project information and consultation via various means including:</p> <ul style="list-style-type: none"> ▪ Telephonic consultation. ▪ Email correspondence. ▪ SMS and/or WhatsApp. ▪ The Dedicated data free portal platform will ensure that I&APs are afforded sufficient opportunity to participate in the project and raise comments on the project with interest in the BA process for the project. This online stakeholder engagement platform which will include the following: <ul style="list-style-type: none"> ○ Background information on the project ○ Project maps (including locality map, layout map, sensitivity map, landowner map, etc.) ○ Photos of the project site and surrounds ○ Presentation providing a summary of the project details and the findings of the BA ○ Posters providing a summary of the findings of the BA ○ A means of submitting written comment or queries. ▪ Virtual meetings, if required, will be conducted using an appropriate platform agreeable to all parties (such as Zoom, Skype or Microsoft Teams). The meeting will be recorded, and the attendees' details captured in an attendance register. Confirmation of their attendance will also be requested by e-mail and the correspondence will be included in the report. <p><i>It should be noted that the use of postage will only be required should and I&AP request that the documents be sent to them via CD or flash drive. All I&APs and OoS have either email / sms and will be sent an electronic link to the website where the reports can be reviewed or downloaded, as well as a data free portal where the reports can be reviewed. Should any I&APs / stakeholders / Oos request documents via post or courier, this will be indicated and proof of postage will be provided in the BA Report. In addition, the project database in the BA Report will reflect whether any I&AP / stakeholder / OoS / Authority received the documents via post or courier.</i></p>
Regulation 41(2)(a) – Site notice	<ul style="list-style-type: none"> • Placement of site notices in English and Afrikaans (as per regulations) along the entrance road to the Gatsrivier Holiday Farm (an affected property - Portion 5 of the Farm Bantamsfontein No 168) during a site visit undertaken in November 2020 (33° 2'21.54"S, 20° 7'56.99"E). • Size and content is in accordance with Regulation 41(3) & 41(4). • Proof incorporated into the DBAR (Appendix 7A)

Regulation/ circular	Approach & Methodology to meet requirements
Regulation 41(2)(b) – Written notification to affected and neighbouring landowners and occupiers; municipality; ward councilors; Organs of State & other parties required by the CA	<ul style="list-style-type: none"> • Notification letters to all I&APs (Appendix 1 of PP Plan – Appendix 7J) and OoS (Appendix 2 of PP Plan – Appendix 7J) will be sent via email and SMS. • Proof of notifications will be incorporated into the Final BA Reports (Appendix 7B)
Regulation 41(2)(c) – (e) – Advertisements	<ul style="list-style-type: none"> • Public notification of the BA process will be advertised in a local newspaper (namely <i>the Noordwester</i>) as well as a Provincial Newspaper (namely <i>Die Burger</i>), as required according to Regulation 41 (2) (c) of the EIA Regulations (2014), as amended. • Process notices (A4 size) with site notice details will be placed at the Sutherland Police Station and Witzenberg Local Municipality offices**.
Regulation 42 – Project database	<ul style="list-style-type: none"> • I&APs have been identified through a process of networking and referral, obtaining information from the SiVEST existing stakeholder database, the neighboring WEF (14/12/16/3/3/1/1976/AM1) and Oya Energy Facility (14/12/16/3/3/2/2009) database and liaison with potentially affected parties in the greater surrounding area. • OoS, key stakeholders and affected and surrounding landowners have been identified and registered on the project database. • Other stakeholders will be required to formally register their interest in the project through either directly contacting the SiVEST Public Participation team via phone, email or fax or use of the SiVEST or Oya website. • In order to access the Oya Data Free Portal platform for a specific project, I&APs will be required to provide their details such that they are automatically registered on the project database. • The register of I&APs will contain the names of: <ul style="list-style-type: none"> ○ all persons who requested to be registered on the database through the use of the Oya website, or in writing and disclosed their interest in the project; ○ all OoS which hold jurisdiction in respect of the activity to which the application relates; and ○ all persons who submitted written comments or attended virtual meetings and viewed virtual presentations on the Oya website during the public participation process. • The information captured on the project database will contain the names, organisation and contact details, as required. <p>All I&APs have access to either email or a cellphone.</p>
Regulation 44 – Comments to be	<ul style="list-style-type: none"> • Comments will be able to be submitted directly to the EAP using the SiVEST sivest_ppp@sivest.co.za email

Regulation/ circular	Approach & Methodology to meet requirements
recorded	<p>address or cell phone via call, SMS or WhatsApp.</p> <ul style="list-style-type: none"> • Written comments can also be submitted via calls, SMS, WhatsApp, email or fax. • Any comments provided telephonically or via instant message will be transcribed and recorded as formal comments. • I&APs without the applicable electronic facilities to access the Oya website will be provided with the opportunity to submit their comments and communicate with the public participation team via SMS, WhatsApp or by sending a Please-call-me notification. These comments will be transcribed and recorded as formal comments. • All comments received throughout the BA process will be acknowledged and captured in the C&RR, with a relevant response. • The C&RR will be included in the final report submitted to the CA. <p><i>It should be noted that I&APs / stakeholders / OoS will be notified throughout the BA process to provide comments via the methods mentioned in this PPP. They will also be advised to contact SiVEST directly, if required, in which case other arrangements can be made (if required). SiVEST's public participation email address is monitored on a daily basis to confirm whether any comments or queries have been received. Once a comment is received the project team will save a copy, respond accordingly (using an appropriate method) and the comment / query will also be added to the Comments and Response Report (C&RR) (along with an appropriate response), which will be attached to the BA Report for consideration. SiVEST will also include all proof of correspondence with I&APs, stakeholder and OoS as part of the BA Report, while the project database in the BA Report will reflect whether any I&AP / stakeholder / OoS / Authority received the documents via post or courier.</i></p>
Regulation 4(2) – Notification of decision on application	<p><u>Notification of Environmental Authorisation (EA)</u> using the following means:</p> <ul style="list-style-type: none"> • Notification letter with details as outlined in the EA issued will be sent via email and SMS (same method used during public consultation described above). • Notification will be available on the project website, as well as the Data Free Portal.

Input into the public participation process by members of the public, I&APs and key stakeholders can be given at various stages of the BA process. Registration on the project database can take place at any time during the BA process up until the final BA report is submitted to the DEFF for decision-making.

Any I&APs that wished to register as an I&AP or comment on the various reports are encouraged to contact SiVEST environmental division.

The contact details were as follows:

Contact: Stephan Jacobs / Hlengiwe Ntuli

✉ PO Box 2921, RIVONIA, 2128

☎ Phone:(011) 798 0600

✉ E-mail:stephanj@sivest.co.za / hlengiwen@sivest.co.za or sivest_ppp@sivest.co.za

☎ Fax:(011) 803 7272

Websites:www.sivest.co.za

There are however established periods in which comments are required from I&APs and key stakeholders to ensure that these are captured in time for the submission of the various reports. The comment periods during the BA process will be implemented according to the EIA Regulations, 2014 (as amended). The comment periods which will be implemented during the BA process (as set out by the EIA Regulations, 2014) are as follows:

- Comment and review period for the Draft Basic Assessment Report (DBAR): 30 days.

As stipulated in the EIA Regulations, 2014 (as amended), and as approved by the DEFF in the PPP Plan, the DBAR will undergo a 30-day comment and review period that will be from **13 November 2020** until **14 December 2020** (excluding public holidays). Where I&APs may not have the applicable facilities i.e. access to internet, provision has been made for the use of electronic tablets which will contain the full DBAR, where all members of the communities can view the report. As such, electronic copies of the DBAR will be made available on digital Tablets at public venues (namely the Sutherland Police Station⁴³ and Witzenberg Local Municipality⁴⁴) and an electronic copy is also available to view or download on an open website (see **section 9.8**). All I&APs and key stakeholders, such as OoS / authorities, who are registered on the project database will be notified of the submission of the DBAR as well as the 30-day comment and review period accordingly. In addition, all OoS / authorities will be sent electronic links of the DBAR. Comments received on the DBAR will be taken into consideration, incorporated into the report (where possible) and will be used when compiling the FBAR, which will be submitted to the competent authority for decision-making.

The EIA Regulations, 2014 (as amended), emphasise the importance of public participation, and even more so during the CoVID-19 lockdown. In terms of these regulations, registered I&APs and key stakeholders –

- may participate in the application process;
- must comment within the timeframes as stipulated by the EIA Regulations, 2014 (as amended);

⁴³ In light of the requirements enforced by the Government Gazette 43096 and the limits on the movement and gatherings of people in an effort to curb the spread CoVID-19, Constable Koopman (PSmTis@saps.gov.za) has confirmed that the report will be sanitised after every viewing. There will also be a bottle of hand sanitiser next to the tablet where the user can sanitise themselves and the report as well to prevent the spread of CoVID-19. A site notice will also be placed next to the report detailing the project details and encouraging the public to practice social distance (i.e.: one at a time), ensure the wearing of masks and the use of hand sanitiser while viewing the report.

⁴⁴ Mr. Hennie Taljaard of the Witzenberg Local Municipality confirmed that he will meet any I&APs wishing to view the digital Tablet in order to explain how the digital Tablet works and to provide assistance (if possible).

- must send a copy of any comments to the applicant or EAP, if the comments were submitted directly to the competent authority; and
- must disclose any direct business, financial, personal or other interests that the person has in the application being granted or refused.

Further, in terms of the EIA Regulations, 2014 (as amended), the EAP:

- manages the application process;
- must be independent;
- must undertake the work objectively, even if this results in views and findings that are not favourable to the applicant;
- must disclose material information that may influence the decision; and
- must conduct a public participation process.

It should be noted that the Public Participation Process is being undertaken in line with Chapter 6 of the EIA Regulations, 2014 (as amended) as well as the agreed PPP Plan and the recent Department circulars.

No Comments / queries / issues / concerns related to the proposed development have been received to date. However, any comments received will be included in **Appendix 7D** of the FBAR. The following actions are undertaken by SiVEST PPP upon receiving comments / queries / issues:

- Once a comment / query / issue / concern has been obtained from an I&AP and/or key stakeholder who was not yet been included in the project database, the contact details provided will be included in the project database for use in future notifications;
- Comments will be addressed in an email (if required) or in the Comments & Response Report (C&RR);
- The C&RR will be updated throughout the BA process to address any comments / queries / issues / concerns received'
- The C&RR will be made available to all I&APs and key stakeholders and will be included in the FBAR (**Appendix 7E**).

The sub-sections below detail the Public Participation Process which has been undertaken to date.

9.3 Overview of the Public Participation Process to date

As mentioned, the Public Participation Process has been undertaken in line with Chapter 6 of the EIA Regulations, 2014 (as amended), as well as the considering the past repealed department circulars⁴⁵ as a guide and the approved Public Participation Plan (PPP).

The public participation process was initiated in October / November 2020 with initial landowner consultation and included the following activities to date:

- An I&AP database was compiled which includes all affected landowners, adjacent landowners, occupiers of affected and adjacent land, other I&APs, key stakeholders (such as OoS).

⁴⁵ In light of the requirements enforced by the Government Gazette 43096 and the limits on the movement and gatherings of people in an effort to curb the spread CoVID-19, Constable Koopman (PSmTis@saps.gov.za) has confirmed that the report will be sanitised after every viewing. There will also be a bottle of hand sanitiser next to the tablet where the user can sanitise themselves and the report as well to prevent the spread of CoVID-19. A site notice will also be placed next to the report detailing the project details and encouraging the public to practice social distance (i.e.: one at a time), ensure the wearing of masks and the use of hand sanitiser while viewing the report.

- The I&AP database is included in **Appendix 7F**. The OoS list is incorporated in **Appendix 7I**.
- English and Afrikaans site notices (as per regulations) were placed within the study area during a site visit undertaken on 05 November 2020.
 - Proof of the site notices is shown in **Appendix 7A**. Refer to **section 9.6** for more information regarding the site notices.
- A Background Information Document (BID) (English and Afrikaans) was compiled will be distributed to I&APs and key stakeholders registered on the project database the week of 16-20 November 2020, along with written notification to all I&APs and key stakeholders.
 - Copies of the BID as well as the written notifications to all I&APs and key stakeholders will be provided in the FBAR (**Appendix 7B**). Proof of distribution will also be included in **Appendix 7B** and **Appendix 7D** of the FBAR.
- Public notification of the BA process was advertised (in English and Afrikaans) in a newspaper (namely *the Noordwester*), as well as a Provincial newspaper (namely *Die Burger*), as required under the EIA Regulations, 2014 (as amended), in November 2020.
 - Proof of the advertisements is provided in **Appendix 7C**.
- Contacting all affected and adjacent landowners to request contact details of the occupiers residing on their land was undertaken and informed the I&AP database.
 - Proof of this is included in **Appendix 7H**.
 - **Table 38** provides details regarding the landowners / occupiers (affected and adjacent) who have been contacted and/or notified with regards to the BA process, as well as the method in which they were contacted.
- The DBAR will be released for public review and comment on 13 November 2020 and will remain in the public domain for 30 days (excluding public holidays), until 14 December 2020.
 - Notificaitons regarding the submission of the DBAR and its availability will be sent the week of 16 – 20 November 2020.
 - Proof of these notifications will be provided in **Appendix 7B** and **Appendix 7I** of the FBAR.
- All OoS will be sent electronic copies of the DBAR, which will be made available for review and comment for a period of 30-days (excluding public holidays).
 - Reminder notifications of the closing period of the DBAR will be sent out approximately one (1) to two (2) weeks, as well as two (2) days prior to the comment period ending in order to ensure that comments and/or concerns are received from the OoS. This will be included in **Appendix 7I** of the FBAR.
- Electronic copies in the form of digital Tablets of the DBAR will also be available from the Sutherland Police Station and Witzenberg Local Municipality offices (details of viewing times below) and an electronic copy will be made available on the following website: <http://ppp.g7energies.com/K6hqwnjlf87>
 - The digital Tablets will be located at the following locations and will be available for review at the below designated times:

Table 37: Details of the tablet viewing

Locations	Address	Open Hours	Contact**
Sutherland Police Station	21 Piet Retief Street Sutherland 6920	8am-5pm for viewing	023-5718040
Witzenberg Local Municipality	53 Voortrekker Street Ceres	8am-4pm for viewing	023-3168554

**** In light of the requirements enforced by the Government Gazette 43096 and the limits on the movement and gatherings of people in an effort to curb the spread CoVID-19, Constable Koopman (PSmTis@saps.gov.za) has confirmed that the report will be sanitised after every viewing. There will also be a bottle of hand sanitiser next to the tablet where the user can sanitise themselves and the report as**

well to prevent the spread of CoVID-19. A site notice will also be placed next to the report detailing the project details and encouraging the public to practice social distance (i.e. one at a time), ensure the wearing of masks and the use of hand sanitiser while viewing the report.

**** Mr. Hennie Taljaard of the Witzenberg Local Municipality confirmed that he will meet any I&APs wishing to view the digital Tablet in order to explain how the digital Tablet works and to provide assistance (if possible).**

The stages that typically form part of the public participation process during a BA process are reflected in **Figure 82** below.

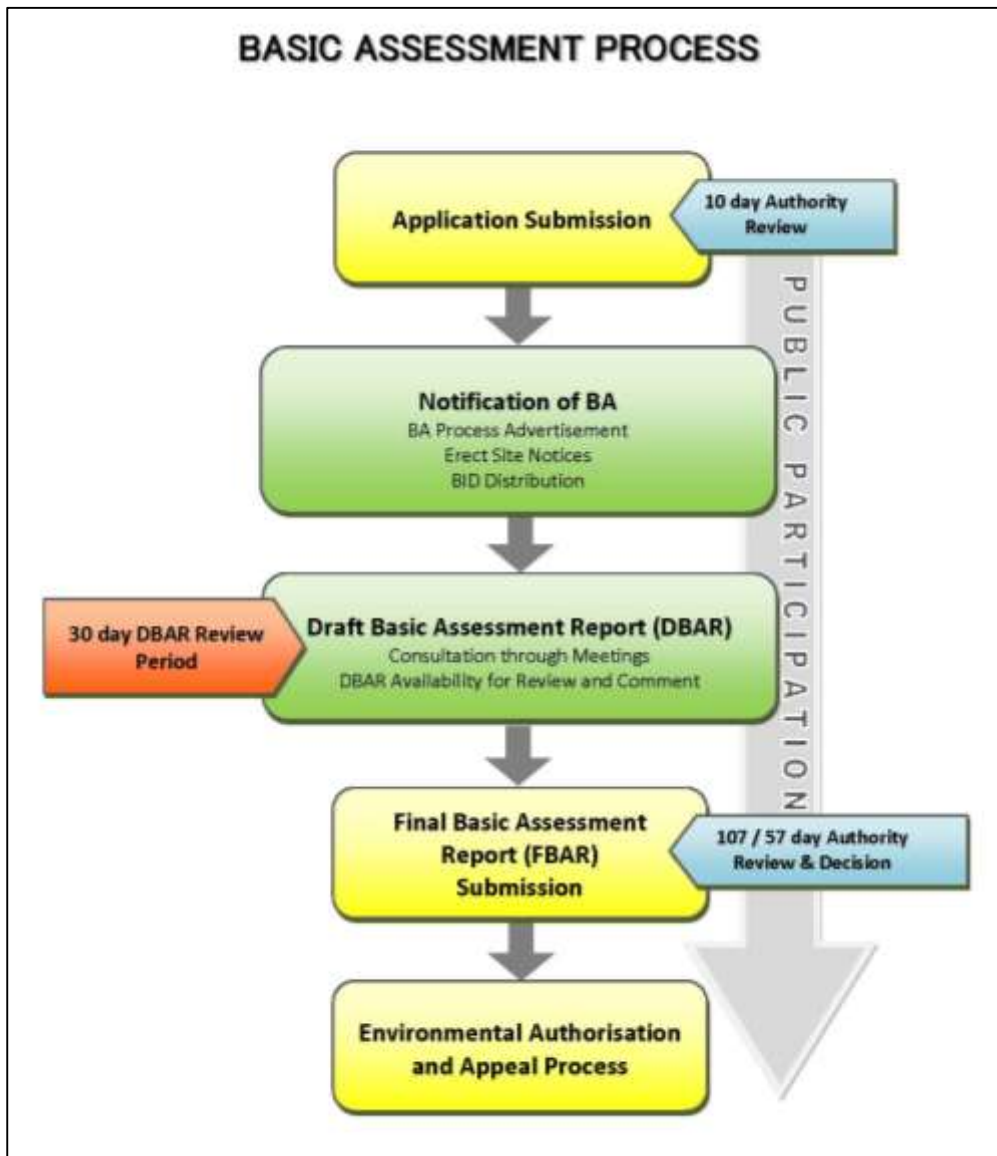


Figure 82: BA and Public Participation Process

On-going consultation with key stakeholders (e.g. provincial, district and local authorities, relevant government departments, local business etc.) and identified I&APs will ensure that I&APs and key stakeholders are kept informed regarding the BA process. Networking with I&APs and key stakeholders will effectively continue throughout the BA process until the final BA report is submitted to the DEFF for decision-making. Where required, key stakeholders and I&APs will be engaged on an individual basis.

During the BA process, individuals, businesses, institutions and organisations, and the following sectors of society have been identified and will be afforded the opportunity to comment and/or raise concerns (the full stakeholder / Organ of State database is included in **Appendix 7I**):

- ATNS
- Birdlife South Africa
- Breede Gouritz Catchment Management Agency
- CapeNature
- Cape Winelands District Municipality
- Department of Agriculture, Forestry and Fisheries
- Department of Agriculture
- Department of Agriculture, Land Reform & Rural Development
- Department of Cultural Affairs & Sport
- Department of Environment, Forestry and Fisheries - Biodiversity
- Department of Environment, Forestry and Fisheries – Air Quality
- Department of Environmental Affairs & Development Planning
- Department of Mineral Resources (DmR)
- Department of Transport and Public Works
- Department of Water and Sanitation
- Endangered Wildlife Trust (EWT)
- ESKOM
- Heritage Western Cape (HWC)
- Independent Communications Authority of South Africa (ICASA)
- National Defence Force
- National Energy Regulator of South Africa (NERSA)
- Northern Cape Department of Agriculture, Land Reform & Rural Development
- Northern Cape Department of Environment and Nature Conservation (NC DENC)
- Northern Cape Provincial Heritage Resources Authority (NCPHRA)
- SA Civil Aviation Authority (SA CAA)
- South African Heritage Resources Agency (SAHRA)
- SANRAL - Western Region
- SANRAL
- SENTECH
- South African Astronomical Observatory (SAAO)
- South African Local Government Association
- South African Weather Service
- Southern African Large Telescope (SALT)
- Square Kilometre Array (SKA)
- TELKOM
- Transnet Freight Rail
- Western Cape Department of Environmental Affairs and Development Planning (WC DEA&DP)
- Wildlife and Environment Society South Africa (WESSA)
- Witzenberg Local Municipality (Environmental)

9.4 Landowner Consent and Notification

Regulation 39 (1) of the EIA Regulations, 2014 (as amended), states that *'if the proponent is not the owner or person in control of the land on which the activity is to be undertaken, the proponent must, before applying for an environmental authorisation in respect of such activity, obtain the written consent of the landowner or person in control of the land to undertake such activity on that land'*.

Regulation 39 (2) of the 2014 NEMA EIA Regulations, 2014 (as amended), further states that '*sub-regulation (1) does not apply in respect of: (a) linear activities; (b) activities constituting, or activities directly related to prospecting or exploration of a mineral and petroleum resource or extraction and primary processing of a mineral or petroleum resource; and (c) strategic integrated projects as contemplated in the Infrastructure Development Act, 2014.*

Since the proposed development constitutes a linear activity according to (b) of Regulation 39 (2) of the 2014 NEMA EIA Regulations, 2014 (as amended), namely the construction of an overhead power line, landowner consent is not required.

The landowners and/or occupants of the affected farm portions, on which the proposed grid connection infrastructure (substation overhead and power line) is proposed, will however been notified. The notifications will be included as **Appendix 7H** of the FBAR and will be submitted to the DEFF for consideration together with the FBAR for comment.

In terms of the Chapter 6, Section 39 of the EIA Regulations, 2014 (as amended), notification of directly adjacent landowners and occupiers is required. As a result, the affected and adjacent landowners will be notified of the proposed development accordingly. Proof of this correspondence will be provided in **Appendix 7H** of the FBAR. **Table 38** below show the landowners / occupiers who will be contacted and/or notified.

Table 38: Landowner / Occupier Database

Parcel_Num	Farm Name	Owner	Stake	Contact Person	Cell	Email	Method of Communication	
							SMS	Email
14/168	Bantamsfontein	Adrian David Marais	Adjacent Owner	David Marais	076 755 6755.	david.marais@uct.ac.za		✓
1/172	Hoek Doornen	Buhr Erhard Johann Ernst	Adjacent Owner	Ernst Erhard Johann Buhr	082 822 5588.	ejebuhr@gmail.com		✓
1/243	Rietpoort	Die Rietpoort Trust	Adjacent Owner	Raplh Demonse	082 344 5911.	damo@iafrica.com		✓
13/168	Bantamsfontein	Elim Trust	Owner	CP Du Tiot	083 388 9757.	margiej@prudent.co.za		✓
1/169	Lower Roodewal	HARUSPEX TRADING PTY LTD	Adjacent Owner	Louis Egbert Greef	082 561 5352.		✓	
171	Witte Wall		Adjacent Owner				✓	
1/164	Brandenburg	Hansie De Jongh Familietrust	Adjacent Owner	Hansie Dejong	084 582 0420.		✓	
1/156	Gats Rivier	Hendrik Jakobus Visser	Adjacent Owner	Hennie Visser	086 606 8297.	anetenhenni@worldonline.co.za		✓
RE/155	Baakens Rivier		Owner				✓	
7/168	Bantamsfontein	Jan Gabriel Du Toit	Adjacent Owner	Heinie Du Tiot	083 229 9132.	remhoogte@ceresremhoogte.co.za		✓
RE/168	Bantamsfontein		Adjacent Owner				✓	
4/168	Bantamsfontein		Owner				✓	
RE/163	Smits Winkel		Johannes Abraham Heyns				Adjacent Owner	Mathys Heyns
5/168	Bantamsfontein	Joseph Fourie Barnard	Adjacent Owner	Fourie Barnard	076 210 3659.	fmfouriebarnard @outlook.com		✓
RE/152	Bakovens Kloof	Kromfontein Plase Pty Ltd	Adjacent Owner	Gys Du Toit Jr.	082 491 7214.	gysjr@dutoit.com		✓
2/152	Bakovens Kloof		Adjacent Owner				✓	
1/152	Bakovens Kloof		Adjacent Owner				✓	
2/168	Bantamsfontein		Adjacent Owner				✓	
RE/164	Brandenburg	Lakenvlei Trust	Adjacent Owner	JW van Wyk	082 855 9904.		✓	

3/155	Baakens Rivier		Adjacent Owner				✓	
RE/236	Fontein Kop	Lambrechts Cornelis Du Toit	Adjacent Owner	Lambrechts Cornelis Du Toit	082 787 9204.		✓	
RE/169	Lower Roodewal	Mauritz Johannes Walters	Owner	Mauritz Walters	082 895 5226.	riverside.ceres1@gmail.com		✓
447	Doringrivier		Adjacent Owner					✓
241	Die Brak	Meulenhof Inv Pty Ltd	Owner	Andre Corneluis	078 422 6226.	andre.sadawa@gmail.com		✓
258	Tierberg	P B Malherbe Trust	Adjacent Owner	Deon Malherbe	082 389 4202.	deon@eselfontein.co.za		✓
RE/243	Rietpoort	QUALITY POWER PROP PTY LTD	Owner	Johan Geldenhuys	082 448 7106.	kingspring@breede.co.za		✓
239	Sadawa	ESELFONTEIN VRUGTE PTY LTD	Adjacent Owner	Gideon Francois Malherbe	023 312 2996.	eselfontein@worldonline.co.za		✓
240	Platfontein	RSA	Owner	N/A	N/A	N/A		
RE/252	Zand Rivier	Silver Crow Prop 8 Pty Ltd	Adjacent Owner	Mark Catling	084 248 1234.		✓	
RE/172	Hoek Doornen	Slagboom C C	Adjacent Owner	Ernst Erhard Johann Buhr*	082 443 4881.	ejebuhr@gmail.com		✓
9/154	Klipfontein		Adjacent Owner					✓
3/157	Riet Fontein	Spitskop Trust	Adjacent Owner	Thinus van der Merwe	083 444 9752.	admin@fonteintjie.co.za		✓
RE/244	Toover Berg	Tooverberg Boerdery Pty Ltd	Adjacent Owner	Kosie Moller	083 303 0408.	kmoller@kparys.co.za		
1/155	Baakens Rivier		Adjacent Owner				✓	
2/155	Baakens Rivier		Adjacent Owner				✓	
RE/154	Klipfontein		Adjacent Owner				✓	
8/154	Klipfontein	William James Gibson	Adjacent Owner	William James Gibson	082 493 0569.		✓	
6/168	Bantamsfontein		Adjacent Owner				✓	
247	Bruwelsfontein	Witzenberg Properties Pty Ltd	Adjacent Owner	Pieter Johannes Graaff	082 447 4375.		✓	

9.5 Notification of Stakeholders and I&APs

In line with Regulation 41 (2) (b) of GN R. 326 and prior to the commencement of the BA process (and advertising the BA Process in the local print media), an initial database of I&APs (including key stakeholders and OoS) was developed for the BA process. This was supplemented with input from the applicant as well as the EAP's experience. **Appendix 7F** contains a detailed copy of the I&AP database. All key stakeholders and I&APs have been added to the project database.

In line with Regulation 41 (2)(b) of the EIA Regulations, 2014 (as amended), the database includes the details of the following:

- Landowners of the affected properties / farm portions;
- Landowners of the neighbouring adjacent properties / farm portions;
 - Contact details of known occupiers of the affected properties / farm portions and neighbouring adjacent properties / farm portions (Refer to **Appendix 7H**);
- The municipal councilors of the wards in which the proposed development will be undertaken;
- The municipalities which have jurisdiction in the areas (i.e. the Witzenberg and Karoo Hoogland Local Municipalities, as well as Cape Winelands and Namakwa District Municipalities);
- Relevant OoS that have jurisdiction in respect of any aspect of the activity; and
- Any other party as required by the DEFF.

Communication with I&APs and key stakeholders will be conducted by means of telephone and email in order to obtain the necessary background information to compile this report. **All I&APs and OoS have either email or cellphones as per the I&AP database.**

An advertisement was placed in *the Noordwester* and *Die Burger* newspapers in November 2020. Proof of the above-mentioned advertisement that was placed is provided in **Appendix 7C**.

In addition, site notices (as per regulations) were erected along the entrance road to the Gatsrivier Holiday Farm (an affected property - Portion 5 of the Farm Bantamsfontein No 168) during a site visit undertaken on 05 November 2020 (33° 2'21.54"S, 20° 7'56.99"E). Proof of the site notices which were erected is provided in **Appendix 7A**.

As I&APs and key stakeholders respond to the above-mentioned advertisements, they will be registered on the project database and sent letters of invitation to participate, as well as the BID. The EAP will continue to register I&APs and key stakeholders on the project database and send them letters of invitation to participate as well as the BID, as they respond to the above-mentioned advertisements.

It should be noted that all key stakeholders and I&APs who are registered on the project database will receive written notification of the commencement of the BA process, as well as a copy of the BID. These notifications will be sent out the week of 16 – 20 November 2020 and proof will be provided in the FBAR. In addition, they will also receive written notification about the availability of the DBAR for review and comment. All OoS will also be sent electronic copies of the DBAR for comment and review. Proof of these notifications will be provided in **Appendix 7B** and **Appendix 7I** of the FSR.

9.6 Proof of Notification

Appendix 7 includes the proof of all notifications to I&APs and key stakeholders to date. More specifically, the types of proofs are as follows:

- Site notice text (**Appendix 7A**);

- Photographs of site notices (**Appendix 7A**);
- BID (to be sent out week of 16 – 20 November 2020 and proof will be included in **Appendix 7B** of FSR. A copy of the BID has however been provided in **Appendix 7B** of this DBAR);
- Proof of BID Distribution (to be included in **Appendix 7B** of FSR);
- Notification of commencement of BA process (to be sent out week of 16 – 20 November 2020 and proof will be included in **Appendix 7B** of FSR);
- Proof of advertisements in local and provincial newspapers (**Appendix 7C**);
- Notification to landowners of affected and neighbouring adjacent farm portions (to be sent out week of 16 – 20 November 2020 and proof will be included in **Appendix 7H** of the FSR); and
- Notification to OoS / key stakeholders (**Appendix 7I**).

9.7 Site Notices

As mentioned, site notices (as per regulations) were erected along the entrance road to the Gatsrivier Holiday Farm (an affected property - Portion 5 of the Farm Bantamsfontein No 168) during a site visit undertaken on 05 November 2020 (33° 2'21.54"S, 20° 7'56.99"E), before commencement of the 30-day public review period. Please refer to **Appendix 7A** for proof of the site notices.

9.8 Comment and Review of Draft Basic Assessment Report (DBAR)

The DBAR will be circulated to all I&APs and key stakeholders for comment and review for a period of 30-days after submission to the DEFF, from **13 November 2020** to **14 December 2020**, excluding public holidays.

The report will be made available to the public for review and comment for a period of 30 calendar days, excluding public holidays (**Table 37**).

The report can also be downloaded from the following website: <http://ppp.g7energies.com/K6hqwnjlf87>, as well as a Data Free Portal (the link to this portal will be on the main website whereby all registered I&APs can download the document at no cost) during the 30-day comment and review period.

Written notice via email and SMS will be given to all registered I&APs and key stakeholders on the project database that the DBAR is available for comment and review (proof to be included in **Appendix 7B** of FBAR). Electronic copies (Flash Disk / CD) of the DBAR will also be distributed on written request, otherwise a link to the DBAR will be shared with all I&APs.

Issues, comments and concerns will be captured in the C&RR, which will be included in **Appendix 7E** of the FBAR. This will include all comments received following the 30-day comment and review period of the DBAR. The C&RR provides a summary of the issues and concerns raised, as well as responses provided to I&APs and key stakeholders.

9.9 Review of the Draft Basic Assessment Report (DBAR) by Organs of State (OoS) / Key Stakeholders

In terms of section 40 (2) of the EIA Regulations, 2014 (as amended), public participation must include consultation with all OoS which have jurisdiction in respect of the activity to which the application relates.

Table 39 below includes all the OoS who will be e-mailed the DBAR and sent electronic copies of the full report, including all appendices as well as the method in which they will be notified. Telephonic follow-up will be done throughout the 30-day DBAR comment and review period in order to provide them with ample opportunity to comment.

Table 39: Organs of State (OoS) database

BASIC ASSESSMENT (BA) FOR THE PROPOSED DEVELOPMENT OF THE 132kV OYA POWERLINE NEAR MATJIESFONTEIN IN THE WESTERN CAPE PROVINCE								
DISTRIBUTION OF THE DRAFT BASIC ASSESSMENT REPORT TO ORGANS OF STATE FOR COMMENT								
TITLE	SURNAME	NAME	POSITION	EMAIL ADDRESS	FORMAT DOCUMENT IS SHARED	METHOD OF COMMUNICATION		
						EMAIL	SMS	
CAPE WINELANDS DISTRICT MUNICIPALITY								
Mr	Mgajo	M	Municipal Manager	mm@capewinelands.gov.za	Email will be sent to explain the project between 16 November 2020 to 20 November 2020. A link to the website will be shared The report will also be set via we Transfer	✓		
Mr	Du Plessis	Kobus	LED and Land Use Planning	kobusdp@capewinelands.gov.za		✓		
WITZENBERG LOCAL MUNICIPALITY								
Mr	Nasson	David	Municipal Manager	david@witzenberg.gov.za	Email will be sent to explain the project between 16 November 2020 to 20 November 2020. A link to the website will be shared The report will also be set via we Transfer	✓		
Mr	Taljaard	Hennie	Senior Town Planner	htaljaard@witzenberg.gov.za		✓		
NAMAKWA DISTRICT MUNICIPALITY								

Mr	Fortuin	Chris	Municipal Manager	chrisf@namakwa-dm.gov.za	Email will be sent to explain the project between 16 November 2020 to 20 November 2020. A link to the website will be shared The report will also be set via we Transfer	✓	
KAROO HOOGLAND LOCAL MUNICIPALITY							
Mr	Fortuin	Jannie	Municipal Manager	munman@karoohoogland.gov.za	Email will be sent to explain the project between 16 November 2020 to 20 November 2020. A link to the website will be shared The report will also be set via we Transfer	✓	
Mr	Gibbons	Allistar	Community Service Manager	a.gibbons@karoohoogland.gov.za	A link to the website will be shared The report will also be set via we Transfer	✓	
ATNS							
Ms	Smit	Ferdi	System Specialist Radar Technical Services CT International Airport	ferdis@atns.co.za	Email will be sent to explain the project between 16 November 2020 to 20 November 2020.	✓	
Mr	Mondzinger	Graham	Obstacle Evaluator	GrahamM@atns.co.za	A link to the website will be shared	✓	
Mr	De Lange	Phillip	Manager: Manager of Western and Northern Cape	phillipd@atns.co.za	The report will also be set via we Transfer	✓	
DEPARTMENT OF AGRICULTURE							
Mr	van der Walt	Cor		CorvdW@elsenburg.com	Email will be sent to explain the project	✓	
Mr	Layman	Brandon		landuse.elsenburg@elsenburg.com BrandonL@elsenburg.com	between 16 November 2020 to 20 November	✓	

Mr	Opperman	Carl		carl@awk.co.za info@awk.co.za	2020. A link to the website will be shared The report will also be set via we Transfer	✓	
BIRDLIFE SOUTH AFRICA							
Mr	Booth	Jonathan	Policy Manager	advocacy@birdlife.org.za	Email will be sent to explain the project between 16 November 2020 to 20 November 2020. A link to the website will be shared The report will also be set via we Transfer	✓	
Ms	Ralston	Samantha		energy@birdlife.org.za		✓	
BREDE GOURITZ CATCHMENT MANAGEMENT AGENCY							
Ms	Mthimkhulu	Makhosi		MMthimkhulu@bgcma.co.za	Email will be sent to explain the project between 16 November 2020 to 20 November 2020. A link to the website will be shared The report will also be set via we Transfer	✓	
Ms	Sam	Andiswa		ASam@bgcma.co.za		✓	
CAPE NATURE							
Ms	Simons	Megan	Land Use Advice	msimons@capenature.co.za	Email will be sent to explain the project between 16 November 2020 to 20 November 2020. A link to the website will be shared The report will also be set via we Transfer	✓	
Mr	Fordham	Colin	Scientist: Land Use Advice	cfordham@capenature.co.za		✓	

ENDANGERED WILDLIFE TRUST								
Mr	Little	Ian	Senior Manager	ianl@ewt.org.za	Email will be sent to explain the project between 16 November 2020 to 20 November 2020. A link to the website will be shared The report will also be set via we Transfer	✓		
Mr	Leeuwner	Lourens	Renewable Energy Project Manager	lourensl@ewt.org.za		✓		
ESKOM								
Mr	Crous	Andre	Eskom Telecommunications	andre.crous@eskom.co.za	Email will be sent to explain the project between 16 November 2020 to 20 November 2020. A link to the website will be shared The report will also be set via we Transfer	✓		
Mr	Nala	Bheki	Manager Telecommunications	nalamb@eskom.co.za		✓		
Mr	Geeringh	John	Chief Planner	GeerinJH@eskom.co.za		✓		
Ms	Hector	Ambrose		HectorA@eskom.co.za		✓		
DEPARTMENT OF ENVIRONMENT, FORESTRY AND FISHERIES - BIODIVERSITY								
Mr	Lekota	Seoka		slekota@environment.gov.za	Email will be sent to explain the project between 16 November 2020 to 20 November 2020. A link to the website will be shared The report will also be set via we Transfer	✓		
Mr	Rabothata	Mmatlala		slekotamrabothata@environment.gov.za		✓		
DEPARTMENT OF WATER AND SANITATION								
Mr	Roberts	John		RobertsJ@dwa.gov.za		✓		

Ms	Schwartz	Chantel	Director: Institutional Establishment	MahunonyaneM@dws.gov.za	Email will be sent to explain the project between 16 November 2020 to 20 November 2020. A link to the website will be shared The report will also be set via we Transfer	✓	
Mr	Khan	Rashid		KhanR@dws.gov.za		✓	
DEPARTMENT OF MINERAL RESOURCES (DMR)							
Ms	Kunene	Dudzile	Regional Manager	Dudzile.Kunene@dmr.gov.za	Email will be sent to explain the project between 16 November 2020 to 20 November 2020. A link to the website will be shared The report will also be set via we Transfer	✓	
DEPARTMENT OF AGRICULTURE, FORESTRY AND FISHERIES							
<i>Provincial Department - Western Cape Department</i>							
Mr	van Rhyn	Petro	Head of Communication	petrov@elsenburg.com	Email will be sent to explain the project between 16 November 2020 to 20 November 2020. A link to the website will be shared The report will also be set via we Transfer	✓	
<i>National Department</i>							
Ms	Buthelezi	Thoko	AgriLand Liaison Office	ThokoB@daff.gov.za	Email will be sent to explain the project	✓	

Ms	Gabriel	Mary Jean		maryjeang@daff.gov.za	between 16 November 2020 to 20 November 2020. A link to the website will be shared The report will also be set via we Transfer	✓	
DEPARTMENT OF CULTURAL AFFAIRS & SPORT							
Ms	Heli	Vuyokazi	Heritage Resource Management	Vuyokazi.Heli@westerncape.gov.za HWC.HWC@westerncape.gov.za	Email will be sent to explain the project between 16 November 2020 to 20 November 2020. A link to the website will be shared The report will also be set via we Transfer	✓	
DEPARTMENT OF AGRICULTURE, LAND REFORM & RURAL DEVELOPMENT							
Mr	Legodi	Lucky		lucky.legodi@drdlr.gov.za	Email will be sent to explain the project between 16 November 2020 to 20 November 2020. A link to the website will be shared The report will also be set via we Transfer	✓	
DEPARTMENT OF ENVIRONMENTAL AFFAIRS & DEVELOPMENT PLANNING							
Mr	Toefy	Zaahir	Director: Development Facilitation	Zaahir.toefy@westerncape.gov.za	Email will be sent to explain the project between 16 November 2020 to 20 November 2020. A link to the website will be shared	✓	
Mrs	La Meyer	Adri	Directorate: Development Facilitation	Adri.Lameyer@westerncape.gov.za		✓	

					The report will also be set via we Transfer		
DEPARTMENT OF TRANSPORT AND PUBLIC WORKS							
<i>Provincial Department - Western Cape Department</i>							
Mr	Carstens	Schalk	Chief Engineer	Schalk.Carstens@westerncape.gov.za	Email will be sent to explain the project between 16 November 2020 to 20 November 2020.	✓	
Ms	Swanepoel	Grace		Grace.Swanepoel@westerncape.gov.za		✓	
National Department							
Mr	Welman	Ben		bigben@mweb.co.za	A link to the website will be shared The report will also be set via we Transfer	✓	
Mr	Manyathi	T		Transport.Publicworks@westerncape.gov.za		✓	
HERITAGE WESTERN CAPE							
Ms	Peters	Ameerah	PA to CEO	ceoheritage@westerncape.gov.za	Email will be sent to explain the project between 16 November 2020 to 20 November 2020. A link to the website will be shared The report will also be set via we Transfer	✓	
Ms	Scheermeyer	Colette	Heritage Officer	Colette.Scheermeyer@westerncape.gov.za		✓	
SANRAL - WESTERN REGION							
Ms	Abrahams	Nicole	Environmental Coordinator	abrahamsn@nra.co.za	Email will be sent to explain the project between 16 November 2020 to 20 November 2020. A link to the website will be shared The report will also be set via we Transfer	✓	

SQUARE KILOMETRE ARRAY							
Dr	Tiplady	Adriaan	Manager: Site Categorisation	atiplady@ska.ac.za	Email will be sent to explain the project between 16 November 2020 to 20 November 2020. A link to the website will be shared The report will also be set via we Transfer	✓	
SA CIVIL AVIATION AUTHORITY (SA CAA)							
Ms	Stoh	Lizell	Obstacle Specialist	strohl@caa.co.za	Email will be sent to explain the project between 16 November 2020 to 20 November 2020. A link to the website will be shared The report will also be set via we Transfer	✓	
SOUTH AFRICAN ASTRONOMICAL OBSERVATORY							
Prof	Ted	Williams	Director	williams@sao.ac.za	Email will be sent to explain the project between 16 November 2020 to 20 November 2020. A link to the website will be shared The report will also be set via we Transfer	✓	
Dr	Sefako	Ramotholo	Telescope Operations (TOPS)	rrs@sao.ac.za		✓	
SOUTHERN AFRICAN LARGE TELESCOPE							
Mr	Chris	Coetzee	Technical Operations Manager Southerland Site	chris@salt.ac.za	Email will be sent to explain the project between 16 November	✓	

Ms	Hlazo	Mavela		salt@salt.ac.za	2020 to 20 November 2020. A link to the website will be shared The report will also be set via we Transfer	✓	
SOUTH AFRICAN WEATHER SERVICE							
Ms	Nelly	Boshielo	South African Weather Service	Nelly.Boshielo@weathersa.co.za	Email will be sent to explain the project between 16 November 2020 to 20 November 2020. A link to the website will be shared The report will also be set via we Transfer	✓	
SENTECH							
Mr	Koegelenberg	Johan	Broadcast Coverage Planner: RF Networks	koegelenbergj@sentech.co.za	Email will be sent to explain the project between 16 November 2020 to 20 November 2020. A link to the website will be shared The report will also be set via we Transfer	✓	
Mr	Motlhake	Serame	Network Planning Manager	motlhakes@sentech.co.za		✓	
Mr	Creese	Frank	Senior TCC Manager: Operations and Maintenance (Western Region)	creeseef@sentech.co.za		✓	
Ms	Pretorius	Alisha		pretoriusa@sentech.co.za		✓	
SOUTH AFRICAN LOCAL GOVERNMENT ASSOCIATION							
Ms	Harigobin	Chantal		sharigobin@salga.org.za	Email will be sent to explain the project between 16 November 2020 to 20 November 2020.	✓	

					A link to the website will be shared The report will also be set via we Transfer		
TELKOM							
Mr	Shaw	Leonard		leonardS@openserve.co.za	Email will be sent to explain the project between 16 November 2020 to 20 November 2020. A link to the website will be shared The report will also be set via we Transfer	✓	
Mr	Thurling	Keverne		Thurling@telkom.co.za		✓	
Mrs	Hartman	Loretta	Wayleave Officer	LorettaH@openserve.co.za		✓	
TRANSNET FREIGHT RAIL							
Mr	Coetzee	Herman	Radio Communication Department	herman.coetzee2@transnet.net	Email will be sent to explain the project between 16 November 2020 to 20 November 2020. A link to the website will be shared The report will also be set via we Transfer	✓	
Mr	Govender	Devon		devon.govender@transnet.net		✓	
WESSA							
Mr	Griffiths	Morgan	Environmental Governance Programme Manager	morgan.griffiths@wessa.co.za	Email will be sent to explain the project between 16 November 2020 to 20 November 2020. A link to the website will be shared The report will also be set via we Transfer	✓	

9.10 Comments and Response Report (C&RR)

It should be noted that no comments have been received to date. All comments received throughout the BA process will be included in the C&RR, which will be submitted as part of the FBAR (**Appendix 7E**). The C&RR provides a summary of the comments received and issues raised by I&APs and key stakeholders, as well as the responses provided. This information will be used to feed into the evaluation of environmental and social impacts and will be taken into consideration when compiling this FBAR.

10 ASSESSMENT IN TERMS OF EQUATOR PRINCIPLES

The Equator Principles (EPs) are a financial industry benchmark for determining, assessing and managing social and environmental risk in project financing. Several banks, exchanges and organisations worldwide have adopted the EPs as requirements to be undertaken for project funding on application and approval. Furthermore, certain funding institutions have not formally adopted the EPs, but require clients to be compliant with them in order to qualify for loans. The EPs are summarised below:

Principle 1: Review and Categorisation

When a project is proposed for financing subject to adherence to EPs, the Equator Principles Funding Institution (“EPFI”) will categorise the project based on the magnitude of its potential environmental and social impacts and risks.

Principle 2: Environmental and Social Assessment

For each project assessed as being either Category A or Category B, the client / borrower must conduct a Social and Environmental Assessment (“Assessment”) process to address the relevant impacts and risks of the proposed project. The Assessment should also propose mitigation and management measures relevant and appropriate to the nature and scale of the proposed project. This BA meets this requirement.

Principle 3: Applicable Environmental and Social Standards

The Assessment will refer to the applicable IFC Performance Standards and applicable Industry Specific Environmental, Health, and Safety (EHS) Guidelines.

Principle 4: Environmental and Social Management System and Equator Principles Action Plan

The client / borrower must prepare an Environmental and Social Management System (ESMS). Further, an Environmental and Social Management Plan (ESMP) must be prepared by the client to address issues raised in the Assessment process and incorporate actions required to comply with the applicable standards. Where applicable standards are not met to the EPFI’s satisfaction, the client and the EPFI will agree to an Equator Principles Action Plan to outline gaps and commitments. The EMPr meets this requirement.

Principle 5: Stakeholder Engagement

For all Category A and Category B Projects, the EPFI will require the client to demonstrate effective Stakeholder Engagement as an on-going process in a structured and culturally appropriate manner with Affected Communities and, where relevant, Other Stakeholders. For projects with potentially significant adverse impacts on Affected Communities, the client will conduct an Informed Consultation and Participation process. The client will tailor its consultation process to the risks and impacts of the Project; the Project’s phase of development; the language preferences of the Affected Communities; their decision-making processes; and the needs of disadvantaged and vulnerable groups.

Principle 6: Grievance Mechanism

The EPFI will require the client, as part of the ESMS, to establish a grievance mechanism designed to receive and facilitate resolution of concerns and grievances about the project's environmental and social performance. The grievance mechanism is required to be scaled to the risks and impacts of the Project and have Affected Communities as its primary user. It will seek to resolve concerns promptly, using an understandable and transparent consultative process that is culturally appropriate, readily accessible, at no cost, and without retribution to the party that originated the issue or concern. The mechanism should not impede access to judicial or administrative remedies.

Principle 7: Independent Review

For all Category A projects and, as appropriate, for Category B projects, an independent social or environmental expert not directly associated with the borrower must review the Assessment, AP and consultation process documentation in order to assist the EPFIs due diligence and assess EPs compliance.

Principle 8: Covenants

An important strength of the EPs is the incorporation of covenants linked to compliance. For all projects, the client will covenant in the financing documentation to comply with all relevant host country environmental and social laws, regulations and permits in all material respects. For Category A and B projects, the client / borrower will covenant in financing documentation:

- To comply with the ESMPs and EPs AP (where applicable) during the construction and operation of the Project in all material respects;
- To provide periodic reports in a format agreed with the EPFI (with the frequency of these reports proportionate to the severity of impacts, or as required by law, but not less than annually), prepared by in-house staff or third-party experts, that i) document compliance with the ESMPs and EPs AP (where applicable), and ii) provide representation of compliance with relevant local, state and host country environmental and social laws, regulations and permits; and
- To decommission the facilities, where applicable and appropriate, in accordance with an agreed decommissioning plan.

Principle 9: Independent Monitoring and Reporting

To ensure on-going monitoring and reporting over the life of the loan, EPFIs will, for all Category A projects, and as appropriate, for Category B projects, require appointment of an independent environmental and/or social expert, or require that the borrower to retain qualified and experienced external experts to verify its monitoring information, which would be shared with EPFIs.

Principle 10: Reporting and Transparency

For all Category A and, as appropriate, Category B Projects:

- The client will ensure that, at a minimum, a summary of the ESIA is accessible and available online.
- The client will publicly report GHG emission levels (combined Scope 1 and Scope 2 Emissions) during the operational phase for Projects emitting over 100,000 tonnes of CO² equivalent annually.

Although this report is not written in terms of the EPs, it fully acknowledges that EPs will need to be complied with should funding for the proposed development be required from a development financial institution. In general, the following documentation will need to be considered in that regard:

- The "Equator Principles" 2013
- International Finance Corporations Performance Standards on Social and Environment, IFC, January 2012, namely:

- Performance Standard 1: Social and Environmental Assessment and Management Systems
- Performance Standard 2: Labour and Working Conditions
- Performance Standard 3: Pollution Prevention and Abatement
- Performance Standard 4: Community Health, Safety and Security
- Performance Standard 5: Land Acquisition and Involuntary Resettlement
- Performance Standard 6: Biodiversity Conservation and Sustainable Natural Resource Management
- Performance Standard 7: Indigenous Peoples
- Performance Standard 8: Cultural Heritage
- International Finance Corporation – World Bank Guidelines, General EHS Guidelines 2007.

EHS Guidelines are technical reference documents with general and industry-specific examples of Good International Industry Practice. These EHS Guidelines are applied as required by the World Bank's respective policies and standards. These General EHS Guidelines are designed to be used together with the relevant Industry Sector EHS Guidelines which provide guidance to users on EHS issues in specific industry sectors.

- The EHS Guidelines contain the performance levels and measures that are generally considered to be achievable in new facilities by existing technology at reasonable costs.

According to these principles, the performance standards relevant to the proposed development are summarised in **Table 40**.

Table 40: IFC 2012 Performance Standards

Performance Standard	Intent and objective	Requirements	Project Specific Applicability
Assessment and Management of Environmental and Social Risks and Impacts (1)	<p>Underscores the importance of managing environmental and social performance throughout the life of a project. An effective Environmental and Social Management System (ESMS) is a dynamic and continuous process initiated and supported by management, and involves engagement between the client, its workers, local communities directly affected by the project (the Affected Communities) and, where appropriate, other stakeholders.</p> <p>Objectives:</p> <ul style="list-style-type: none"> ▪ To identify and evaluate environmental and social risks and impacts of the project. ▪ To adopt a mitigation hierarchy to anticipate and avoid, or where avoidance is not possible, minimize, and, where residual impacts remain, compensate/offset for risks and impacts to workers, Affected Communities, and the environment. ▪ To promote improved environmental and social performance of clients through the effective use of management systems. ▪ To ensure that grievances from Affected Communities and external communications from other stakeholders are responded to and managed appropriately. ▪ To promote and provide means for adequate engagement with Affected Communities throughout the project cycle on issues that could potentially affect them and to ensure that relevant environmental and social information is disclosed and disseminated. 	<ul style="list-style-type: none"> ▪ Policy ▪ Identification of Risks and Impacts Management Programmes ▪ Organisational Capacity and Competency ▪ Emergency Preparedness and Response ▪ Monitoring and Review ▪ Stakeholder Engagement ▪ External Communication and Grievance Mechanism ▪ Ongoing Reporting to Affected Communities 	<p>A formal Environmental and Social Management System will be compiled, of which the EMPr (Appendix 8) can form the basis of.</p>
Labour and Working Conditions (2)	<ul style="list-style-type: none"> ▪ Looks at the working conditions by following these principles; ▪ To establish and maintain the worker- management relationship (including specifically a human resources policy). 	<ul style="list-style-type: none"> ▪ Working Conditions and Management of Worker Relationship ▪ Protecting the Work Force ▪ Occupational Health and Safety 	<p>A Formal human resource and labour policies will be compiled in the event that the project is developed.</p>

Performance Standard	Intent and objective	Requirements	Project Specific Applicability
	<ul style="list-style-type: none"> ▪ To promote fair treatment, non-discrimination and equal opportunity of employees (and some contractors) and meet national employment laws. ▪ To protect the workforce by addressing child labour and forced labour. ▪ To promote healthy and safe working conditions. 	<ul style="list-style-type: none"> ▪ Workers Engaged by Third Parties ▪ Supply Chain 	
Resource Efficiency and Pollution Prevention (3)	<ul style="list-style-type: none"> ▪ To avoid and minimize adverse impacts on human health and the environment by avoiding or minimizing pollution from project activities. ▪ To promote the reduction of emissions that contributes to climate change. 	<ul style="list-style-type: none"> ▪ Resource Efficiency ▪ Pollution Prevention 	The project entails the construction and operation of a substation and overhead power line to feed electricity from renewable energy generation facilities as well as hybrid generation facilities specifically designed for the RMIPPPP requiring base-load generation. The proposed project therefore brings a unique value add that it can deliver some renewable energy to government instead of pure fuel-based facilities.
Community Health Safety and Security (4)	<ul style="list-style-type: none"> ▪ To avoid or minimise risks to and impacts on the health and safety of the local community during the project life cycle from both routine and non-routine circumstances. ▪ To ensure that the use of security personnel is carried out in a legitimate manner that avoids or minimizes risks to the community's safety and security. 	Community Health and Safety Security Personnel	<p>The requirements included in PS 4 have been addressed in the BA process and the development of the EMPr (Appendix 8). The appropriate management plans have been included in the EMPr and Emergency Response Plan.</p> <p>All plans have been made site specific for the financial close process, in the event that the project is developed. Furthermore a Health and Safety Plan will be implemented during construction.</p>

Performance Standard	Intent and objective	Requirements	Project Specific Applicability
Land Acquisition and Involuntary Resettlement (5)	<ul style="list-style-type: none"> To avoid or at least minimize involuntary resettlement wherever feasible by exploring alternative project designs. To mitigate adverse social and economic impacts from land acquisition or restrictions on affected persons' use of land by; (i) providing compensation for loss of assets at replacement cost, and (ii) ensuring that resettlement activities are implemented with appropriate disclosure of information, consultation, and the informed participation of those affected. To improve or at least restore the livelihoods and standards of living of displaced persons. To improve living conditions among displaced persons through provision of adequate housing with security of tenure at resettlement sites. 	Displacement Private Sector Responsibilities Under Government-Managed Resettlement	No resettlement applicable
Biodiversity Conservation and Sustainable Management of Living Natural Resources (6)	<ul style="list-style-type: none"> To promote and conserve biodiversity. To avoid the introduction of alien invasive species. To promote sustainable management and use of natural resources (NRM). 	<ul style="list-style-type: none"> Protection of Conservation of Biodiversity Management of Ecosystem Services Sustainable Management of Living Resources Supply Chain 	The requirements included in PS 6 have been addressed via numerous specialist studies and the findings and assessment associated with these aspects have been discussed in the BA process (sections 6 and 7). The EMPr (Appendix 8) incorporates mitigation measures from the specialist reports to ensure that aspects such as conservation of biodiversity and alien plants control are considered.
Indigenous People (7)	<ul style="list-style-type: none"> To foster full respect for the dignity, human rights, aspirations, cultures and natural resource-based livelihoods of Indigenous Peoples (IP). To avoid impacts or where avoidance is not feasible, minimize, mitigate and compensate in a culturally appropriate fashion and within the framework of successful good faith negotiation (a form of stakeholder engagement requiring approval of both parties). 	<ul style="list-style-type: none"> Circumstances Requiring Free, Prior and Informed Consent Mitigation and Development Benefits Private Sector Responsibilities where Government is Responsible for Managing Indigenous Peoples Issues 	The requirements included in PS 7 have been addressed in the BA process and the development of the EMPr (Appendix 8). An extensive public participation process is undertaken as part of the BA process which engages all stakeholders, authorities and

Performance Standard	Intent and objective	Requirements	Project Specific Applicability
	<ul style="list-style-type: none"> ▪ To establish and maintain effective relationships with IPs over the course of the project. 	<ul style="list-style-type: none"> ▪ 	<p>interested and affected persons who may be affected (refer to section 9). Furthermore, a Socio-Economic Study (Appendix 6F) was undertaken and recommendations from this study incorporated into the EMPr (Appendix 8).</p>
Cultural Heritage (8)	<ul style="list-style-type: none"> ▪ To protect cultural heritage from adverse impacts of project activities and support its preservation. ▪ To promote the equitable sharing of benefits from the use of cultural heritage in business activities. 	<ul style="list-style-type: none"> ▪ Protection of Cultural Heritage in Project Design and Execution ▪ Project's Use of Cultural Heritage 	<p>The requirements included in PS 8 have been addressed through a heritage study, which includes cultural landscapes (Appendix 6E), that was undertaken as part of the BA process. Recommendation and mitigation measures from this study are incorporated into the EMPr (Appendix 8).</p>

10.1 Assessment Results

This section details the current compliance level with which the proposed development meets with the EPs and the related Performance Standards which are outlined below.

The coding key is as follows:

Compliance Level			
Clear			
Not assessed / determined	Not compliant	Partially compliant	Compliant

Table 41: Compliance level of proposed development in terms of EPs and related performance standards

Principles	Compliance Level	Reference
General, Performance Standard 1 Environmental & Social Reporting		
1. Baseline Information		Refer to section 3 – Technical Details and section 6 – Description of the receiving environment
2. Alternatives (Assessment of alternatives)		Refer to section 8
3. Impacts and risks		Refer to section 7
4. Global impacts	N/A	N/A
5. Legal requirements		Refer to section 4 for legal requirements and guidelines
6. Transboundary	N/A	N/A
7. Disadvantaged / vulnerable groups		Addressed in Appendix 6D as part of the Socio-Economic Impact Assessment. This has also been addressed as part of the EMPr (Appendix 8)
8. Third party		Refer to section 1.1 and Appendix 6D .
9. Mitigation measures		Addressed in section 7 , as well as part of specialist assessments (Appendix 6). Also addressed as part of the EMPr (Appendix 8)
10. Documentation process		Refer to section 1 , section 4 and section 9
11. Action Plans		Partially addressed in section 12 . No major Action Plans required as mostly generic mitigation measures have been required
12. Organisational capacity		Refer to Appendix 1
13. Training		

Principles	Compliance Level	Reference
14. Grievance mechanism		Refer to Appendix 1 . The applicant will commit to full compliance with this standard when financial closure has been reached. The applicant is fully aware of the implications of this standard and this information will be made available in due course as part of the development planning for the project.
15. Report content		Refer to section 1
Performance Standard 2, Labour & Working Conditions		
1. Human Resource Policy		Refer to Appendix 1 . The applicant will commit to full compliance with this standard when financial closure has been reached. The applicant is fully aware of the implications of this standard and this information will be made available in due course as part of the development planning for the project.
2. Working relationship		Refer to Appendix 1
3. Working conditions with and terms of employment		
4. Workers organisation		
5. Non-discrimination and equal opportunities		Refer to Appendix 1 . Partly addressed in section 7 as part of the Social Impact Assessment (Appendix 6D). This issue has also been addressed as part of the EMPr (Appendix 8)
6. Grievance mechanism		Refer to Appendix 1 . Addressed as part of the EMPr (Appendix 8)
7. Occupational Health and Safety		
8. Non-employee workers		
9. Supply Chain		
10. Labour Assessment Component of a Social and Environmental Assessment		
Performance Standard 3, Pollution		
1. Pollution Prevention, Resource Conservation and Energy Efficiency		Refer to EMPr in Appendix 8
2. Wastes		
3. Hazardous material		
4. Dangerous substances		

Principles	Compliance Level	Reference
5. Emergency preparedness and response		Refer to EMPr in Appendix 8 . The applicant will commit to full compliance with this standard when financial closure has been reached. The applicant is fully aware of the implications of this standard and this information will be made available in due course as part of the development planning for the project
6. Technical guidance – ambient considerations		Refer to Appendix 1
7. Greenhouse gas emissions		N/A. No greenhouse gas emissions will result from the proposed development apart from the manufacturing of the components and limited emissions during construction phase
Performance Standard 4, Health & Safety		
1. Hazardous materials safety		Refer to EMPr in Appendix 8
2. Environmental and natural resource issues		Refer to section 7
3. Emergency preparedness and response		Refer to EMPr in Appendix 8 . The applicant will commit to full compliance with this standard when financial closure has been reached. The applicant is fully aware of the implications of this standard and this information will be made available in due course as part of the development planning for the project
Performance Standard 5, Land Acquisition		
Performance Standard 6, Biodiversity		
Performance Standard 7, Indigenous People		
Performance Standard 8, Cultural Heritage		

It is important to note that most of the issues listed per performance standard in the table above will only be addressed during the pre-construction and construction phase of the proposed development.

11 ENVIRONMENTAL MONITORING AND AUDITING

The Environmental Management Programme (EMPr) becomes a tool by which compliance on the proposed site can be measured against. In order to utilise this tool, environmental monitoring needs to take place with regular audits against the EMPr to ensure that all aspects are attended to.

Environmental monitoring establishes benchmarks to judge the nature and magnitude of potential environmental and social impacts.

Some of the key parameters for monitoring and auditing of the proposed development include the following *inter alia*:

- Impacts on Terrestrial Ecology;
- Impacts on Avifauna;
- Impacts to Agriculture and Soils;
- Impact on Surface Water;
- Visual impacts on the area imposed by the components of the proposed development;
- Impacts on heritage resources, including archaeology, paleontology and the cultural landscape; and
- Positive and negative socio-economic impacts.

The overall objective of environmental and social monitoring is to ensure that mitigation measures are implemented and that they are effective. Environmental and social monitoring will also enable responses to new and developing issues of concern. The activities and indicators that have been recommended for monitoring are presented in the EMPr.

The EMPr is included in **Appendix 8**. It should be noted that a **Final EMPr will be submitted to the DEFF for review and approval** along with the Final BA Report (BAR)

Environmental monitoring will be carried out to ensure that all construction and operation activities comply and adhere to environmental provisions and standard specifications, so that all mitigation measures are implemented. The contractor shall employ an officer responsible for implementation of social / environmental requirements. This person will maintain regular contact with the local / district Environmental Officers. The contractor and applicant will have a responsibility to ensure that the proposed mitigation measures are properly implemented during the construction phase.

A monitoring programme will be implemented for the duration of the lifecycle of the proposed development.

This programme will include:

- Regular Audits During the Construction Phase;
- According to the EMPr, EA and permit conditions which will be conducted by the Environmental Control Officer (ECO). These audits can be conducted randomly and do not require prior arrangement with the project manager;
- Compilation of an audit report with a rating of the compliance with the EMPr. This report will be submitted to the relevant authorities;
- Annual Audits conducted during the Operational Phase; and
- Undertaken by the ECO.

In terms of section 4.5 of the Regulations prescribing the format of the Atmospheric Impact Report (DEA, 2013), details of any air quality compliance and enforcement actions undertaken against the

enterprise in the last five (5) years must be specified. These actions include directives, compliance notices, interdicts, prosecutions, fines, etc that may have been received by the facility

The environmental monitoring program will operate throughout the pre-construction, construction, and operation phases. It will consist of a number of activities, each with a specific purpose with key indicators and criteria for significance assessment.

11.1 Planning and Design Phase

- Ensures that the design of the development responds to the identified environmental constraints and opportunities;
- Ensures that pre-construction activities are undertaken in accordance with all relevant legislative requirements;
- Ensures that adequate regard has been taken of identified environmental sensitivities, as well as any landowner and community concerns and that these are appropriately addressed through design and planning (where applicable);
- Enables the construction activities to be undertaken without significant disruption to other land uses and activities in the area; and
- Ensures that the best environmental options are selected for the development.

11.2 Construction Phase

- Ensures that construction activities are properly managed in respect of environmental aspects and impacts;
- Enables construction activities to be undertaken without significant disruption to other land uses and activities in the area, in particular concerning noise impacts, farming practices, traffic and road use, and effects on local residents;
- Minimises the impact on the indigenous natural vegetation, protected tree species, and habitats of ecological value;
- Minimises impacts on fauna using the site; and
- Minimises the impact on heritage sites, should they be uncovered.

11.3 Operation Phase

- Ensures that operational activities are properly managed in respect of environmental aspects and impacts;
- Enables the operation activities to be undertaken without significant disruption to other land uses in the area, in particular with regard to farming practices, traffic and road use, and effects on local residents; and
- Minimises impacts on fauna.

During the operation phase, the Holder of the EA must undertake the following activities (as required):

- Conduct annual basis reviews of the EMP to evaluate its effectiveness.
- Take appropriate action as a result of findings and recommendations in management reviews and audits.
- Develop and implement an Environmental Management System (EMS) for the development (including all associated infrastructure).
- Manage and report on the development's environmental performance.

- Maintain a register of all known environmental impacts and manage the monitoring thereof.
- Conduct internal environmental audits and co-ordinate external environmental audits.
- Liaise with statutory bodies such as the National and Provincial departments of Environment, Forestry and Fisheries (DEFF, WC DEA&DP, CapeNature and DENC) on environmental performance and other issues.
- Conduct environmental training and awareness for the employees who operate and maintain the development.
- Compile environmental policies and procedures.
- Liaise with I&APs on environmental issues of common concern.
- Track and control the lodging of any complaints regarding environmental matters.

11.4 Decommissioning Phase

At the end of the operational phase of the proposed development, the proposed development might need to be decommissioned. This would include the decommissioning of the substations as well as the overhead power lines connecting the substations to the grid (i.e. the 132kV overhead power lines). Should the proposed development need to be decommissioned, the applicant will rehabilitate the project site as per the requirements in the NEMA Regulations, following the decommissioning of the project site. The aim of the decommissioning phase would be to return the site to its original pre-construction condition or as close to that as possible. In the unlikely event that decommissioning is required (i.e. PPA not renewed, facility becoming outdated or the land being required for other purposes), the decommissioning phase will be undertaken in line with the EMPr and the requirements in the NEMA Regulations, and the site will be rehabilitated to its original pre-construction condition.

Most of the components of the proposed development are considered to be re-usable or recyclable. In the event of the proposed development being decommissioned, the components will be re-used and recycled (where possible) or disposed of (where necessary) in accordance with the relevant regulatory requirements. Certain components may also be traded or sold, should there be an active second-hand market for these components. Alternatively, in the event that sale is not possible, certain components may be used as scrap metal. It must be noted that the decommissioning phase of the proposed development will also create skilled and un-skilled employment opportunities.

The general specifications of Construction and Rehabilitation are relevant to the decommissioning of the proposed development and must be adhered to. These include the following, amongst others:

- All structures not required for the post-decommissioning use of the site are dismantled and/or demolished, removed and waste material disposed of at an appropriately licensed waste disposal site or as required by the relevant legislation.
- Rehabilitate access / service roads and servitudes not required for the post-decommissioning use of the development. If necessary, an Ecologist must be consulted to give input into rehabilitation specifications.
- All disturbed areas must be compacted, sloped and contoured to ensure drainage and run-off and to minimise the risk of erosion.
- Monitor rehabilitated areas quarterly for at least a year following decommissioning and implement remedial action, as and when required.
- Any fauna encountered during decommissioning activities must be removed to safety by a suitably qualified person.
- All vehicles to adhere to low speed limits (i.e.40km/h max) on the project site, to reduce risk of faunal collisions as well as reduce dust.
- Retrenchments must comply with South African Labour legislation of the day.

Monitoring must be undertaken at a number of levels (**Figure 83**). Firstly, it must be undertaken by the Contractor at work sites during construction, under the direction and guidance of the Supervision Consultant who is responsible for reporting the monitoring to the implementing agencies. It is not the Contractor's responsibility to monitor land acquisition and compensation issues. It is recommended that the Contractor employ local full time qualified environmental inspectors for the duration of the Contract. The Supervision Consultant must include the services of an independent environmental and monitoring specialist on a part-time basis as part of their team.

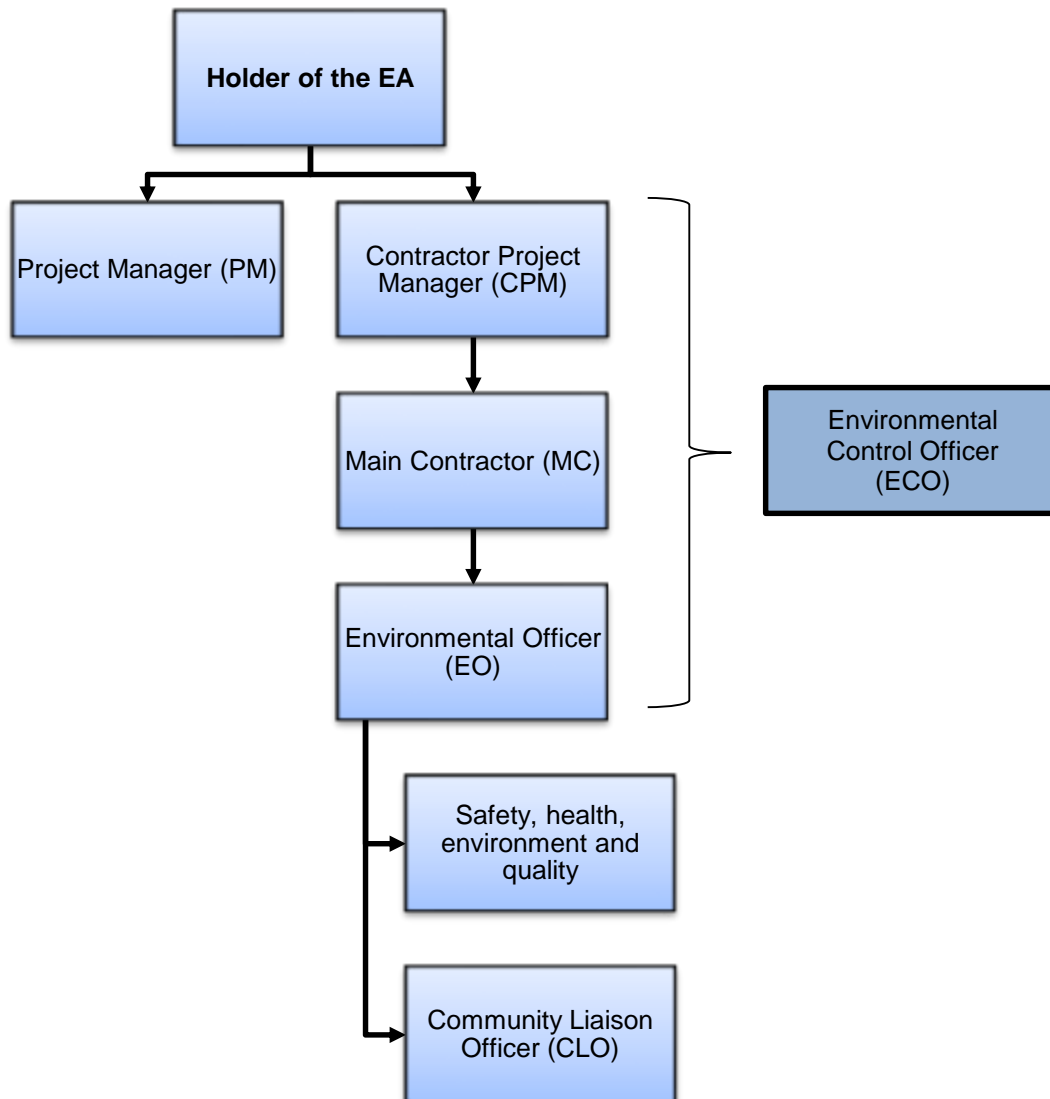


Figure 83: Organogram indicating the organisational structure

Environmental monitoring is also an essential component of project implementation. It facilitates and ensures the follow-up of the implementation of the proposed mitigation measure, as they are required. It helps to anticipate possible environmental hazards and/or detect unpredicted impacts over time.

Periodic on-going monitoring will be required during the life of the proposed development and the level can be determined once the proposed development is operational.

12 CONCLUSIONS AND RECOMMENDATIONS

Oya Energy is proposing to construct a 132kV overhead power line and 33/132kV substations near Matjiesfontein in the Western and Northern Cape Provinces (hereafter referred to as the “proposed development”). The overall objective of the proposed development is to feed the electricity generated by the proposed Oya Energy Facility (part of separate on-going EIA process with **DEFF Ref No.: 14/12/16/3/3/2/2009**) as well as potentially the nearby developments into the national grid. The grid connection and substations (this application) require separate EAs, in order to allow the EAs to be handed over to Eskom.

The BA process for the proposed development has been conducted in accordance with the EIA Regulations, 2014 (as amended), promulgated in terms of Chapter 5 of the NEMA (as amended).

A detailed public participation process is being followed during the BA process which conforms to the public consultation requirements as stipulated in the EIA Regulations, 2014 (as amended) as well as Government Gazette 43096 (refer to **section 9**). In addition, all issues raised by I&APs and key stakeholders will be captured in the FBAR and where possible, mitigation measures provided in the EMPr (**Appendix 8**) to address these concerns.

As sustainable development requires all relevant factors to be considered, including the principles contained in section 2 of the NEMA, as amended, the DBAR has strived to demonstrate that where impacts were identified, these have been considered in the determination of the preferred layout.

A summary of the findings for each identified environmental impact evaluated in the context of the proposed development (both biophysical and social) is provided in **Table 42** below.

12.1 Summary of Findings

A summary of the findings for each identified environmental impact evaluated in the context of the proposed development (both biophysical and social) is provided in the table below.

Table 42: Summary of environmental issues identified in Specialist Studies

Specialist	Key findings	Impacts	Impact pre mitigation	Impact post mitigation
Specialist Studies				
Agricultural and Soils Compliance Statement	<p>The key findings include:</p> <ul style="list-style-type: none"> ▪ The aridity of the area is a significant agricultural constraint that seriously limits the level of agricultural production (including grazing) which is possible across the site. ▪ Shallow, sandy soils on underlying rock or carbonate hardpan are a further agricultural limitation. ▪ As a result of these limitations, the study area is unsuitable for cultivation and agricultural land use is limited to low density grazing. The majority of land within the development area is classified as low agricultural sensitivity by the screening tool, but includes areas of medium sensitivity. ▪ The only possible agricultural impact is minimal soil and land degradation (erosion and topsoil loss) as a result of land disturbance during construction and decommissioning. ▪ The conclusion of this assessment is that the proposed development will not have an unacceptable negative impact on the agricultural production capability of the site. The proposed development is therefore acceptable. This is substantiated by the facts that the land is of very low agricultural potential, the amount of agricultural land loss is insignificant, and that the proposed development poses a low risk in terms of causing soil degradation. ▪ From an agricultural impact point of view, it is recommended that the proposed development be approved. 	Please refer to Section 9 of Agriculture and Soils Compliance Statement (Appendix 6A of DBAR)		
Surface Water (including walkdown)	The purpose of the Surface Water Impact Assessment Report is to define the ecology of the proposed development in terms of the watercourse characteristics, including mapping of the natural watercourse, defining areas of increased Ecological Importance and Sensitivity (EIS), and defining the Present Ecological State (PES) of the watercourses associated with the proposed development. The Department of Water and Sanitation (DWS) Risk Assessment Matrix as promulgated in Government Notice 509 as published in the Government Gazette 40229 of 2016 as it relates to the National Water Act, 1998 (Act No. 36 of 1998) (NWA) and EIA Regulations, 2014 (as amended) in terms of the NEMA was applied to determine the significance of the impacts	Construction Phase		
		Direct Impacts		
		Watercourse drivers and receptors such as hydrology, water quality (when surface water is present), geomorphology, habitat and biota.	- Medium	- Low
		Indirect Impacts		

Specialist	Key findings	Impacts	Impact pre mitigation	Impact post mitigation
	associated with the proposed development and mitigatory measures were identified which aim to minimise the potential impacts.	Watercourse drivers and receptors such as hydrology, water quality (when surface water is present) and geomorphology	- Low	- Low
	During the site visit undertaken on the 22 nd to 24 th of October 2020, several ephemeral tributaries with riparian vegetation, ephemeral rivers and episodic drainage lines (EDLs) without riparian vegetation were identified in the investigation area. Although these episodic drainage lines cannot be classified as rivers or streams in the traditional sense thereof due to the lack of saturated soils and riparian vegetation, they do still function as waterways, through episodic conveying of water. Based on the definition of a watercourse as per the National Water Act, 1998 (Act No. 36 of 1998), water does flow regularly or intermittently within these drainage lines, conveying water from the upgradient catchment area into the downgradient tributaries and the ephemeral rivers. As such, they can be considered as watercourses due to their importance for hydrological functioning and therefore enjoy protection in terms of the National Water Act, 1998 (Act No. 36 of 1998). Several areas hosting episodic preferential flow paths (PFP) were also identified. As with the EDLs, these preferential flow paths also lack riparian and wetland characteristics and may potentially only convey surface water for a short period of time after rainfall events. Thus, these features are not considered of ecological importance but contributes to the hydrological functioning of the drainage systems at large. The PFP cannot be considered as watercourses (thus no ecological assessment undertaken) and may potentially only enjoy protection in terms of the National Water Act, 1998 (Act No. 36 of 1998) should a floodline be applicable to these features. The results of the ecological assessment of the watercourses are discussed in Section 6.1 of the Surface Water Impact Assessment Report.	Watercourse drivers and receptors such as vegetation, geomorphology and sediment balance.	- Low	- Low
		Operation Phase		
		Indirect Impacts		
		Watercourse drivers and receptors such as vegetation, geomorphology and sediment balance.	- Low	- Low
		Decommissioning Phase		
		Direct Impacts		
		Watercourse drivers and receptors such as hydrology, water quality (when surface water is present), geomorphology, habitat and biota.	- Medium	- Low
		Cumulative		
		Direct Impacts		
		Drainage system habitat integrity and hydrological functioning	- Medium	- Low
		'No-Go'		
		No-Go Alternative (the option of not fulfilling the proposed project)	+ Low	+ Low
	The activities associated with the construction and operational phases of the proposed power line and substation development based on the alignment provided by the proponent, includes site preparation, excavation of pits installation of the pylons. Section 6.4 of the Surface Water Impact Assessment Report provides the outcome of the impact assessment.			
	Direct negative medium impacts associated with creating new access roads to service the power line and substation development are expected to occur to the watercourse drivers and receptors during the construction phase. Should the recommended			

Specialist	Key findings	Impacts	Impact pre mitigation	Impact post mitigation			
	<p>mitigation measures be implemented with specific mention of only installing pylons outside the delineated extent of the watercourses and its associated 32m NEMA Zone of Regulation, a negative low impact significance is expected to occur. It is therefore recommended that the mitigation measures as stipulated in Table 10 and 11 and the good housekeeping measures as per Appendix F be implemented to prevent and direct/indirect impacts from occurring on the watercourses. None of the proposed power line development alternatives are considered fatally flawed, however preference is given to power line alternative 3 and 4 since these power line routes are routed along existing power line infrastructure which has already incurred environmental disturbances and have existing access roads which may be utilised during the current proposed construction and operational phases of the power line between the Oya Energy Facility and the Kappa substation, and these power line alternatives are considered to have the least amount of watercourse crossings. As such, it is the opinion of the freshwater specialist that EA may be granted for the proposed development. Should the construction of the road crossings in the watercourses be undertaken in the driest period of the year when no surface flow is present and the recommended mitigation measures are applied, the risk significance of the proposed development can be reduced and Water Use Authorisation by means of General Authorisation (GA) in terms of Section 21(c) and (i) water uses may potentially be obtained in consultation with the Department of Water and Sanitation (DWS). However, the DWS, the custodian of water resources in South Africa, must be consulted with regards to the outcome of this assessment.</p> <p>Based on the findings of the freshwater ecological assessment and the results of the impact and risk assessments, it is the opinion of the ecologist that the proposed development poses a negative low risk to the integrity of the watercourses in the investigation area provided that adherence to cogent, well-conceived and ecologically sensitive construction plans are implemented and the mitigation measures provided in this report as well as general good construction practice are adhered to, the development is considered acceptable.</p>						
Avifauna (including walkdown)	The proposed development will have several direct impacts on priority avifauna. No indirect impacts are envisaged. Direct impacts can be summarised as follows:	<table border="1"> <tr> <td>Planning Phase</td> </tr> <tr> <td>None</td> </tr> <tr> <td>Construction Phase</td> </tr> </table>	Planning Phase	None	Construction Phase		
Planning Phase							
None							
Construction Phase							

Specialist	Key findings	Impacts	Impact pre mitigation	Impact post mitigation
	<ul style="list-style-type: none"> Displacement of priority species due to habitat destruction in the substation footprint, and due to disturbance associated with the construction activities. Mortality of priority species due to electrocutions in the substation yard. Mortality of priority species due to collisions with the 132kV OHL. <p>CONSTRUCTION PHASE <i>Displacement of priority species due to habitat destruction in the substation footprint and disturbance associated with the construction activities</i></p> <p>Construction activities could impact on birds breeding, foraging and roosting in or in close proximity of the proposed transmission substation through transformation of habitat, which could result in temporary or permanent displacement. Unfortunately, very little mitigation can be applied to reduce the significance of this impact as the total permanent transformation of the natural habitat within the construction footprint of the substation yard is unavoidable. Fortunately, due to the nature of the vegetation, and judged by the existing power lines, very little if any vegetation clearing will be required in the power line servitudes. The habitat in the study area is very uniform from a bird impact perspective; therefore, the loss of habitat for priority species due to direct habitat transformation associated with the construction of the proposed substation is likely to be fairly minimal. The species most likely to be directly affected by this impact would be small, non-Red Data species.</p> <p>Apart from direct habitat destruction, the above-mentioned activities also impact on birds through disturbance; this could lead to breeding failure if the disturbance happens during a critical part of the breeding cycle. Construction activities in close proximity to breeding locations could be a source of disturbance and could lead to temporary breeding failure or even permanent abandonment of nests. A potential mitigation measure is the timeous identification of nests and the timing of the construction activities to avoid disturbance during a critical phase of the breeding cycle, although in practice that can admittedly be very challenging to implement. Large terrestrial species namely Ludwig's Bustard, Karoo Korhaan and Southern Black Korhaan are most likely to be affected by displacement due to disturbance. Cliff-nesting Jackal Buzzards, Booted Eagles, Verreaux's Eagles and Black Storks could also potentially be vulnerable to this impact.</p>	<p>Direct Impacts</p> <p>Displacement of priority species due to habitat destruction in the substation footprint</p> <p>Displacement of priority species due to disturbance associated with the construction activities</p> <p>Indirect Impacts</p> <p>None</p> <p>Operation Phase</p> <p>Direct Impacts</p> <p>Mortality of priority species due to electrocutions in the substation yard</p> <p>Mortality of priority species due to collisions with the 132kV OHL</p> <p>Indirect Impacts</p> <p>None</p> <p>Decommissioning Phase</p> <p>Direct Impacts</p> <p>Displacement of priority species due to disturbance associated with the decommissioning activities</p> <p>Indirect Impacts</p> <p>None</p> <p>Cumulative</p>	<p>- Low</p> <p>- Medium</p> <p>- Medium</p> <p>- Low</p> <p>- Medium</p> <p>- Low</p> <p>- Low</p>	<p>- Low</p> <p>- Low</p> <p>- Low</p> <p>- Medium</p> <p>- Medium</p> <p>- Low</p> <p>- Low</p>

Specialist	Key findings	Impacts	Impact pre mitigation	Impact post mitigation
	<p>The priority species which are potentially vulnerable to this impact are listed in Table 2 of the Avifauna Impact Assessment Report (Appendix 6B).</p> <p>This impact is assessed to be medium to low and can be reduced to low through mitigation.</p> <p>OPERATIONAL PHASE Electrocutions in the substation yard Electrocution refers to the scenario where a bird is perched or attempts to perch on the electrical structure and causes an electrical short circuit by physically bridging the air gap between live components and/or live and earthed components (Van Rooyen 2004). The electrocution risk is largely determined by the pole/tower design. In the case of the proposed power lines, no electrocution risk is envisaged because the proposed design of the 132kV line, namely the steel monopole and self-supporting lattice structures, should not pose an electrocution threat to any of the priority species which are likely to occur in the study area. Electrocutions within the proposed substation yard are possible but should not affect the more sensitive Red Data bird species, as these species are unlikely to use the infrastructure within the substation yard for perching or roosting. Species that are more vulnerable to this impact are corvids, owls and certain species of waterbirds.</p> <p>The priority species which are potentially vulnerable to this impact are listed in Table 2 of the Avifauna Impact Assessment Report (Appendix 6B).</p> <p>This impact is assessed to be low and can be further reduced through mitigation.</p> <p>Collisions with the 132kV OHL Collisions are the biggest threat posed by transmission lines to birds in southern Africa (Van Rooyen 2004). Most heavily impacted upon are bustards, storks, cranes and various species of waterbirds, and to a lesser extent, vultures. These species are mostly heavy-bodied birds with limited manoeuvrability, which makes it difficult for them to take the necessary evasive action to avoid colliding with transmission lines (Van Rooyen 2004, Anderson 2001). The most likely Red Data candidates for collision</p>	<p>Direct Impacts</p> <p>Displacement of priority species due to habitat destruction in the substation footprint</p> <p>Displacement of priority species due to disturbance associated with the construction activities</p> <p>Mortality of priority species due to electrocutions in the substation yard</p> <p>Mortality of priority species due to collisions with the 132kV OHL</p> <p>Displacement of priority species due to disturbance associated with the decommissioning activities</p> <p>Indirect Impacts</p> <p>None</p> <p>'No-Go'</p> <p>Direct Impacts</p> <p>None</p> <p>Indirect Impacts</p> <p>None</p>	<p>- Low</p> <p>- Medium</p> <p>- Medium</p> <p>- Medium</p> <p>- Low</p>	<p>- Low</p> <p>- Low</p> <p>- Low</p> <p>- Medium</p> <p>- Low</p>

Specialist	Key findings	Impacts	Impact pre mitigation	Impact post mitigation
	<p>mortality on the proposed OHL are large terrestrial species e.g. bustards, korhaans and Secretarybird, certain raptors and storks, particularly Verreaux's Eagles, Jackal Buzzards and Black Storks where the line drops down the escarpment, and waterbirds at drainage lines and waterbodies.</p> <p>The priority species which are potentially vulnerable to this impact are listed in Table 2 of the Avifauna Impact Assessment Report (Appendix 6B).</p> <p>This impact is assessed to be medium and can be reduced through mitigation, but it will remain at medium level after mitigation.</p> <p>Environmental sensitivities</p> <p>The following environmental sensitivities were identified from an avifaunal perspective for the proposed power line grid connections:</p> <ul style="list-style-type: none"> ▪ High sensitivity (Mitigation required): Surface water <p>Included are areas within 300m of water troughs and earth dams, and all major drainage lines. Surface water in this semi-arid habitat is crucially important for priority avifauna, including several Red Data species such as Martial Eagle, Lanner Falcon, Verreaux's Eagle and Black Stork and many non-priority species. Drainage lines when flowing also attract waterbirds on occasion, as do the large pools that remain in the channel after the flow has stopped. Power lines that are routed near these sources of surface water pose a collision risk to birds using the water for drinking and bathing, and drainage lines, when flowing, are natural flight paths for birds. These areas will require mitigation with Bird Flight Diverters (BFDs).</p> <ul style="list-style-type: none"> ▪ High sensitivity (Mitigation required): Cliffs <p>The proposed OHL runs down two escarpment areas, where it will pose a risk to cliff nesting species such as Verreaux's Eagle, Booted Eagle, Lanner Falcon, Jackal Buzzard and Black Stork. These species all use the declivity wind currents along the</p>			

Specialist	Key findings	Impacts	Impact pre mitigation	Impact post mitigation	
	<p>cliff faces and slopes for lift and they will be at risk of collisions with the OHL where it traverses these cliffs and slopes. These areas will require mitigation with BFDs.</p> <ul style="list-style-type: none"> ▪ Medium sensitivity (Mitigation preferred): Succulent Karoo <p>The entire study area is rated as medium sensitivity due to the regular presence of collision-prone species such as Ludwig's Bustard, Karoo Korhaan and Southern Black Korhaan. It would therefore be advisable to mitigate the whole OHL with BFDs if possible.</p> <p>Conclusion The proposed Oya 132kV OHL is expected to have a medium impact on priority species. This impact could be reduced to low through the application of appropriate mitigation measures. No fatal flaws were discovered in the course of the investigations.</p> <p>Impact Statement Based on the outcome of the investigations into the impact of the proposed 132kV OHL on avifauna, the authorization of the OHL is supported, provided the mitigation measures contained in this specialist report are strictly implemented. The proposed layout is acceptable from an avifauna perspective and should be approved as part of the EA.</p>				
Heritage (including walkdown), including: <ul style="list-style-type: none"> ▪ Archaeology ▪ Palaeontology ▪ Cultural Landscapes 	<p>Anticipated Impacts on Heritage Resources: Some significant heritage resources are located within the 300m (150m x2) corridor for the proposed Alternative 4 alignment. The lithic material identified is of low significance, and even though the resources may be destroyed during the construction, the impact is inconsequential for the majority of the heritage resources identified during the archaeological and palaeontological assessments conducted for this project. These are detailed in Table 4 of the Heritage Impact Assessment (HIA) Report and various mitigation measures are proposed in order to ensure that no impact to these resources takes place. These resources include archaeological sites 130734, 130981 and 131154 around which a buffer of 50m is proposed. Site 130730 is a burial ground site and is very sensitive in terms of impacts. As such, a 100m buffer area around this site is recommended.</p>	HERITAGE IMPACTS (INCLUDING ARCHAEOLOGY, PALAEOLOGY AND CULTURAL LANDSCAPES)	HERITAGE IMPACTS (INCLUDING ARCHAEOLOGY, PALAEOLOGY AND CULTURAL LANDSCAPES)		
Planning and Design Phase			No impacts to heritage resources are anticipated during this phase		
Construction Phase			Impacts to archaeological heritage resources	- Medium	- Low

Specialist	Key findings	Impacts	Impact pre mitigation	Impact post mitigation		
	<p>No significant fossils were identified during the field analysis. This is mostly due to the soil cover and lack of outcrop in the area. Only four fossils were identified in the field assessment and the fossils found were all silicified wood from the Abrahamskraal Formation. None of the samples were found in situ. However, significant palaeontological resources have been previously identified within the 300m corridor for Alternative 4 (SAHRIS Site IDs 130760, 130761, 130768 and 130772). 50m buffers are proposed around these sites to ensure that no impact takes place.</p> <p>The primary heritage impact anticipated for this proposed development is impact to the cultural landscape. Previous Cultural Landscape Assessments conducted in the immediate vicinity of the proposed OHL alignment have identified cultural landscape features of significance including the Cultural Landscape Areas of the Baakensrivier and the Gatsrivier, river confluences, ridge lines, outspans, the historic trunk road and where this road crosses rivers (road river crossings). Various mitigation measures are proposed to mitigate the negative impacts to the cultural landscape including buffer zones, 'no-go' areas and general development guidelines included in section 5.4 of the HIA Report. Importantly, this proposed OHL development is located within a REDZ area with many proposed and already authorised renewable energy facilities in its immediate proximity. In general, it is preferred for this kind of infrastructure to be concentrated on the landscape instead of sprawled out.</p> <p>Alternative 4 is preferred by the developer for the Oya to Kappa overhead power line corridor route, and in light of the above information, also in terms of impacts to heritage resources. The proposed development is unlikely to have a negative impact on significant heritage resources situated within the corridor for the proposed Oya OHL on condition that the proposed mitigation measures including buffer areas and 'no-go' areas are implemented.</p> <p>Recommendations: There is no objection to the proposed development on heritage grounds and the following is recommended:</p> <ul style="list-style-type: none"> Alternative Alignment 4 for the Oya to Kappa overhead power line corridor route is preferred in terms of impacts to heritage No mitigation is required prior to construction operations commencing. 	Impacts to palaeontological resources	- Medium	- Low		
		Impacts to the cultural landscape	- High	- Medium		
		Operation Phase				
		Impacts to archaeological heritage resources	- Medium	- Low		
		Impacts to palaeontological resources	- Medium	- Low		
		Impacts to the cultural landscape	- High	- Medium		
		Decommissioning Phase				
		Impacts to archaeological heritage resources	- Medium	- Low		
		Impacts to palaeontological resources	- Medium	- Low		
		Impacts to the cultural landscape	- High	- Medium		
		Cumulative				
		Impacts to archaeological heritage resources	- Medium	- Low		
		Impacts to palaeontological resources	- Medium	- Low		
		Impacts to the cultural landscape	- High	- Medium		
		'No-Go'				
		The 'no-go' option is a feasible option, however, this would prevent the proposed development from				

Specialist	Key findings	Impacts	Impact pre mitigation	Impact post mitigation
	<ul style="list-style-type: none"> ▪ The recommended buffer areas and 'no-go' areas identified in Table 4 of the HIA Report must inform the final alignment and must be implemented during the construction phase. ▪ During the construction phase all excavations must be monitored for fossil remains by the responsible Environmental Control Officer (ECO) using the HWC Chance Fossil Finds Procedure. Should substantial fossil remains such as vertebrate bones and teeth, petrified wood, plant-rich fossil lenses or dense fossil burrow assemblages be exposed during construction, the responsible ECO should safeguard these, preferably in situ, and alert the South African Heritage Resources Authority (SAHRA) in the Northern Cape and HWC in the Western Cape so that appropriate action can be taken by a professional palaeontologist, ▪ Should 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 be found during the proposed development, SAHRA APM Unit (Natasha Higgitt/Phillip Hine 021 462 5402) in the Northern Cape and HWC in the Western Cape must be alerted. ▪ If unmarked human burials are uncovered in the Northern Cape, the SAHRA Burial Grounds and Graves (BGG) Unit (Mimi Seetelo 012 320 8490), and in the Western Cape, HWC must be alerted immediately as per section 36(6) of the NHRA. A professional archaeologist must be contracted as soon as possible to inspect the findings. A Phase 2 rescue excavation operation may be required subject to permits issued by SAHRA and/or HWC 	contributing to the environmental, social and economic benefits associated with the development of the renewables sector		
Desktop Socio - Economic	<p><i>Comparative Assessment of Layout Alternatives</i></p> <p>Considered purely on a social basis, no clear route alternatives emerge in respect of any of these routes. Taking into account the results of other specialist studies that may have secondary social consequences, such as the archaeological; heritage; palaeontological and visual studies, no least preferred route emerges. Consequently, no social preference has emerged in respect of these 5 route alternatives.</p>		Planning and Design Phase	
		A sensitivity verification, undertaken on 08 October 2020, did not identify any socially linked restrictions, exclusions or prohibitions that apply to the proposed development site or any socially sensitive features on the site. It is therefore unlikely that any negative social impacts will be associated with the planning/pre-construction phase of the project.		

Specialist	Key findings	Impacts	Impact pre mitigation	Impact post mitigation
	<p>The objective of the proposed development is to feed electricity generated by the proposed Oya Energy Facility into the National Grid and, as such, it is an integral component required to ensure the success of the Oya Energy Facility. An additional advantage of the power line is that it provides a potential opportunity to connect nearby developments to the grid, thus eliminating any need for additional infrastructure in the area. Once commissioned, the power line will be absorbed; operated and maintained by Eskom; thus resulting in the power line becoming an Eskom asset and eliminating any risk attached to privately owned transmission grid infrastructure. In this regard, Eskom indicates a commitment “...to developing the electricity supply industry by facilitating the integration of independent power producers (IPPs) into the national grid and buying electricity from IPPs for national distribution”.</p> <p>The entire extent of the proposed overhead power line and substations is located within the Central Strategic Transmission Corridor while also remaining within the boundaries of Renewable Energy Development Zone, Komsberg – REDZ 2 as delineated in GN No. 113.</p> <p>Regarding the negative impacts associated with the project, it is evident that most apply over the short term to the construction phase of the project. Of these impacts, all can be mitigated to within acceptable ranges and there are no fatal flaws associated with the construction or operation of the project. Although over the operational phase, the project will be visible and is likely to alter the sense of place of the area, this should be limited to the extent that it is placed within a REDZ and Strategic Transmission Corridor.</p> <p>In accordance with international and governmental requirements, the project will shift the country away from a high reliance on fossil fuels towards a far greener and cleaner energy generation mix. The proposed development also supports the objectives of the RMIPPPP, which serves as an “emergency” power generation programme for</p>	Construction Phase ⁴⁶		
		Health & social well-being:	- Low	- Low
		Quality of the living environment:	- Low	- Low
		Economic:	+ Low	+ Low
		Operation Phase		
		Health & well-being:	- Low	- Low
		Quality of the living environment:	- Medium	- Medium
		Economic:	+ Medium	+ Medium
		Decommission Phase		

⁴⁶ The Socio-Economic Impact Assessment is based on perceptions and assumptions. It is thus not possible to address direct and indirect impacts as this creates a complicated situation. An example includes sense of place, which incorporates far more than just the visual aspect and is based on perceptions. The specialist was therefore unable to specify whether impacts were direct or indirect. Clarity has however been provided in the Socio-Economic Report (**Appendix 6D**), where possible.

Specialist	Key findings	Impacts	Impact pre mitigation	Impact post mitigation
	<p>accelerated assistance to the national grid amid electricity supply constraints. The DMRE issued a RFP for the emergency procurement of 2000 MW of electricity. Due to the emergency nature of the RMIPPPP, the objective is to procure energy from projects that are near ready and can connect to the grid quickly. The proposed development is deemed to meet these requirements and can reduce the risk of load shedding. Grid capacity is also available and no deep grid works are required, which are beneficial for the connection timelines of the RMIPPPP.</p> <p>The Minister of Mineral Resources and Energy also recently welcomed the concurrence by the NERSA to the second Section 34 Ministerial Determination, which enables the Department to undertake procurement of additional electricity capacity in line with the IRP (2019). 6 800 MW of capacity is determined to be generated from renewable energy sources (PV and Wind), 513 MW from storage and 3 000 MW from gas. The proposed development will be able to contribute to this diverse electricity requirement and will thus actively contribute to the commitments made to increase generation capacity, and ensure the security of energy supply to society rapidly and significantly.</p> <p>Impact Statement</p> <p>Considering all social impacts associated with the project, it is evident that the positive elements outweigh the negative and that the project carries with it a significant social benefit. In addition, the project fits with international and governmental policy and legislation. Consequently, the Proposed 132 kV Oya Power Line and Substation development is supported at the social level</p>	<p>Considering the time to decommissioning, the uncertainty of what would exactly occur over this period and the significance of the impact in isolation; it would be rather meaningless to attach assessment criteria to decommissioning at this point. Apart from this, once the project is commissioned it will become an Eskom and as such could have an extended life span.</p>		
Cumulative				
Health:		- High	- High	
Quality of the living environment:		- Medium	- Medium	
Economic:		+ Very High	+ Very High	
No-go Alternative				
No project alternative		- High	No mitigation measures	
Terrestrial Ecology	<p>The project study area consists of natural habitat within a largely rural area. This is within an area where portions of the natural habitat have been assessed as having potential conservation value, although this project site falls outside of the NPAES entirely and are therefore not earmarked for future conservation. Currently, the rates of transformation within the vegetation in this area is low. The regional vegetation types that occur on site are listed as Least Threatened in the National List of Ecosystems that are Threatened and need of protection (GN 1002 of 2011), published under the National Environmental Management: Biodiversity Act (Act No. 10, 2004).</p>	Planning and Design Phase		
		<p>The Planning / Pre-construction Phase includes any activities associated with planning of the project. This does not involve any physical disturbance of the landscape. There are therefore no impacts on biodiversity / ecology that are relevant to this phase. Nevertheless, measures taken during the Design Phase of the project can potentially have a significant effect on the nature, extent and intensity of impacts experienced during the Construction Phase.</p>		

Specialist	Key findings	Impacts	Impact pre mitigation	Impact post mitigation	
	<p>The Western Cape Biodiversity Spatial Plan, published in 2017 (Pool-Stanvliet et al. 2017) indicates that there are CBA1 areas in two parts of the powerline study area:</p> <ol style="list-style-type: none"> 1. associated with the floodplain of the Grootrivier, corresponding largely with the Tanqua Wash Riviere regional vegetation type - it is not possible to avoid this CBA1 area, although powerline Option 3 traverses this area entirely adjacent to an existing powerline. 2. in the northern side of the study area, which are mostly excluded from the direct footprint of the proposed project, with the exception of a 550 m section within a steep valley across which the powerline corridor traverses - due to the topography, it is possible that this section can be almost completely spanned with a tower structure on each side. <p>All riparian and drainage areas on site are included in Ecological Support Areas, but these have been designated as sensitive on their own merits.</p> <p>There is one (1) plant species, <i>Hoodia gordonii</i>, protected according to the National Environmental Management: Biodiversity Act, that could potentially occur on site, although none were seen during the field survey. There are a number of species protected according to the Cape Nature and Environmental Conservation Ordinance Act (Act No. 19 of 1974) that were recorded on site. None of the species listed that were found on site are of conservation concern, but the fact that they are protected means that a permit will be required for their removal. This is a standard flora permit obtained from the provincial department. Final species and numbers have been determined from a walk-through survey of the proposed infrastructure, for which details are provided in this report (in the section, "Protected Plants: Cape Nature and Environmental Conservation Ordinance 19 of 1974"), where a list of 32 species are known to occur within the footprint of the proposed infrastructure, many of these being common on site and in surrounding areas.</p> <p>There are a small number of fauna of possible conservation concern that were assessed as having a possibility of occurring on site. This includes the Vulnerable Leopard and Black-footed Cat, the near threatened Karoo Dwarf Tortoise, Grey Rhebok (seen on site) and Spectacled Dormouse, and a number of protected species,</p>	Construction Phase			
		Direct Impacts			
		Indigenous natural vegetation		- Medium	- Medium
		Listed or protected plant species		- Medium	- Low
		Faunal habitat and refugia		- Low	- Low
		Fauna		- Low	- Low
		Indigenous natural vegetation		- Low	- Low
		Critical Biodiversity Areas		- Low	- Low
		Indirect Impacts			
		Flora and fauna		- Low	- Low
		Indigenous natural vegetation		- Medium	- Low
		Fauna		- Low	- Low
		Indigenous natural vegetation		- Medium	- Low
		Operational Phase			
		Direct Impacts			
		Indigenous natural vegetation		- Low	- Low
		Fauna		- Low	- Low
		Indigenous natural vegetation		- Medium	- Low
		Indirect Impacts			
		Indigenous natural vegetation		- Medium	- Low
	Fauna		- Low	- Low	
	Decommissioning Phase				

Specialist	Key findings	Impacts	Impact pre mitigation	Impact post mitigation	
	<p>including the Armadillo Girdled Lizard, the Honey Badger, the Black-footed Cat, the Leopard and the Cape Fox. The likelihood of these occurring on site varies between species, with the Grey Rhebok highly likely to occur on site, the Leopard almost certain to occur there, the Spectacled Dormouse and Karoo Dwarf Tortoise having a high probability, and the Black-footed Cat having a moderate probability of occurring there. Based on distribution, habitat requirements and other monitoring research, the Riverine Rabbit is unlikely to occur on site. Some of the species that could potentially occur on site are highly mobile species that are unlikely to be affected by any activities on site, but others are more restricted or territorial and could be more significantly affected. Of those that are more likely to be affected, if they occur there, are the Black-footed Cat, the Spectacled Dormouse, the Armadillo Girdled Lizard and the Karoo Dwarf Tortoise.</p> <p>The vegetation on site consists largely of succulent dwarf shrubland typical of the regional vegetation types. The vegetation on site is relatively uniform within regional vegetation types but varies across the geographical distance of the proposed powerline corridor. The pattern observed on site is that local diversity increases with increased elevation and with higher local surface rockiness. This means that the greatest diversity is at the highest elevations, but also located within specific habitats. Mountain summits, crests and plateau, as well as rocky outcrops, riparian habitats, and scarp valleys were identified as sensitive, either due to having higher diversity, higher value as refugia, or as being particularly sensitive to disturbance.</p> <p>For all infrastructure components, loss of habitat will occur. This will be relatively insignificant in comparison to the total area of the regional vegetation types concerned but may be more significant in terms of local patterns and diversity that could be affected. There is some variability between sites due to local conditions (microhabitats), which has a greater influence on floristic variability than any geographical gradient across the site.</p> <p>The main sensitivity on site is the presence of various watercourses in which there are dry riverbeds and associated riparian vegetation. This habitat is disproportionately</p>	Direct Impacts			
		Indigenous vegetation	natural	- Low	- Low
		Fauna		- Low	- Low
		Indigenous vegetation	natural	- Medium	- Low
		Indirect Impacts			
		Fauna		- Low	- Low
		Indigenous vegetation	natural	- Medium	- Low
		Fauna		- Low	- Low
		'No-Go'			
		Direct Impacts			
		Indigenous vegetation	natural	- Low	- Low
		Indirect Impacts			
		None			
		Cumulative			
		Direct Impacts			
		Indigenous vegetation	natural	- Medium	- Medium
		Listed or protected plant species		- Medium	- Medium
		Landscape processes	ecological	- Medium	- Low
		Critical Areas	Biodiversity	- Medium	- Medium
		Indirect Impacts			
Fauna		- Medium	- Medium		
Indigenous vegetation	natural	- Medium	- Low		

Specialist	Key findings	Impacts	Impact pre mitigation	Impact post mitigation
	<p>important due to the functional value of these watercourses and the important habitat and forage that they provide for animal populations. The habitat is also interconnected and any damage to one point will affect all downstream areas. For this reason, these riparian habitats, along with their floodplains, have been designated as especially sensitive. Other important habitats on site include rocky outcrops, small quartz patches, as well as some steep, south-facing slopes.</p> <p>The project involves construction of a powerline (the tower structures being the primary ground-level construction) as well as substations, and maintenance access roads for the powerline (for which some already exist along the proposed alignments). It is important to avoid local sensitivities and ensure that ecological processes are not compromised. This will ensure that impacts on site do not unnecessarily affect surrounding areas.</p> <p>A detailed assessment of potential impacts was undertaken which identified that loss of habitat is probably the most important potential impact on site. This is a typical outcome for a project proposed to be constructed within a Greenfields area. However, it is important to emphasize that the spatial scale of transformation of natural habitats on site due to the proposed project is negligible in area compared to the total area of vegetation types concerned, as well as any Critical Biodiversity Areas. The footprint of the proposed project will be relatively small due to the fact that each tower structure probably does not occupy more than a 10 x 10 m area. Assuming a total distance of close to 50 km for the powerline, and a tower structure on average every 400 m, this amounts to total area of less than 2 ha. This is in comparison to the total area of Koedoesberge-Moordenaars Karoo, for example, which occupies in the vicinity of close to five hundred (500) square kilometres, or 50 million hectares. The loss of habitat associated with this project is therefore seven orders of magnitude smaller than this and therefore regionally insignificant.</p> <p>Biodiversity patterns on site have been established to a moderate degree of confidence, including a detailed desktop assessment, two reconnaissance field surveys and a detailed walkthrough survey of the entire alignment of proposed alternatives. From this assessment, the following has been established:</p>	Protected fauna	- Medium	- Medium

Specialist	Key findings	Impacts	Impact pre mitigation	Impact post mitigation
	<ol style="list-style-type: none"> 1. No threatened plant or animal species are likely to be affected by the proposed project; 2. A number of plant species protected according to Provincial legislation will be affected, but these are all common and / or widespread species, none of which are of conservation concern. The presence of these species triggers a permit requirement, but does not affect rare or threatened species; 3. The vegetation types affected by the project are widespread and have been transformed overall to a small degree. They are therefore of low conservation concern. The amount of transformation due to the proposed project is small in absolute terms and also relative to the overall distribution of the regional vegetation; 4. There are habitats on site that have been identified as being of higher sensitivity and value than the general vegetation, including wetland and riparian vegetation. These have all been mapped in detail and should be avoided by the project. Residual impacts on these areas of elevated sensitivity are small compared to the distribution of these on site. 5. The only matter of concern for the site is the presence of Critical Biodiversity Areas, which occur in specific areas, and Ecological Support Areas, which coincide entirely within drainage lines and riparian areas. Mitigation measures have been proposed to minimise potential impacts on these areas. <p>Conclusion</p> <p>At the site-specific scale, some sensitivities have been identified, primarily related to natural habitat, but also to some individual (protected) species. Many of these can be minimised or avoided with the application of appropriate mitigation or management measures, including, in some cases, avoidance of sensitive locations. There will be residual impacts, primarily on natural habitat. The amount of habitat that will be lost to the project is insignificant compared to the area in hectares of the regional vegetation type that occurs on site and over the entire geographical range of the vegetation type. In most cases, the exact locations of important biodiversity features have been identified in the field at a relatively high level of confidence.</p> <p>Impact Statement</p>			

Specialist	Key findings	Impacts	Impact pre mitigation	Impact post mitigation
	It is unlikely that the proposed project will have an unacceptable impact on the natural environment or any ecological features of concern. Based on the analysis provided in this report, the overall impact will have LOW significance, the only residual impact of medium significance being on loss of vegetation due to clearing for construction. The conclusion is that the project should be authorised. For the section from Oya to Kappa, the preferred alignment is Option 3 with Option 4 being favourable.			
Visual	<p>The study area has a largely natural, untransformed visual character with some elements of rural / pastoral infrastructure and as such, the proposed power line and substation development would alter the visual character and contrast significantly with the typical land use and/or pattern and form of human elements present across the broader study area. The level of contrast will however be reduced by the presence of the Perdekraal East WEF, Kappa substation and existing high voltage power lines located in the south-western sector of the study area.</p> <p>A broad-scale assessment of landscape sensitivity, based on the physical characteristics of the study area, economic activities and land use that predominates, determined that the area would have a low to moderate visual sensitivity. However, an important factor contributing to the visual sensitivity of an area is the presence, or absence of visual receptors that may value the aesthetic quality of the landscape and depend on it to produce revenue and create jobs.</p> <p>The area is not typically valued for its tourism significance and no formal protected areas, leisure-based tourism activities or recognised tourism routes were identified in the area. In addition, there is limited human habitation resulting in sensitive or potentially sensitive receptors in the area.</p> <p>The Visual Impact Assessment (VIA) identified twenty-three (23) potentially sensitive receptors in the study area, i.e. within 5kms from the outer boundary of the combined power line assessment corridors and substation sites. Two (2) of these receptors are considered to be sensitive receptors as they are linked to leisure/nature-based tourism activities in the area. The remaining eighteen (18) receptors are all farmsteads which are regarded as potentially sensitive visual receptors as they are located within a mostly natural setting and the proposed development will likely alter natural vistas</p>	Planning and Design Phase		
		None		
		Construction Phase		
		Direct Impacts		
		<ul style="list-style-type: none"> Potential alteration of the visual character and sense of place Potential visual impact on receptors in the study area 	- Low	- Low
		Indirect Impacts		
		None		
		Operational Phase		
		Direct Impacts		
		<ul style="list-style-type: none"> Potential alteration of the visual character and sense of place Potential visual impact on receptors in the study area Potential visual impact on the night time visual environment 	- Low	- Low

Specialist	Key findings	Impacts	Impact pre mitigation	Impact post mitigation
<p>experienced from these dwellings. Five of these potentially sensitive receptor locations were however found to be outside the viewshed of the proposed development and thus are not expected to experience any visual impacts as a result of the proposed development, and therefore were removed from the assessment, resulting in only 13 potentially sensitive receptors.</p> <p>The VIA determined that the proposed development will have a high level of impact on one (1) of the sensitive receptors (Remainder of the Farm Baakens Rivier No 155). As this receptor is located on the proposed Oya Energy Facility (DEFF Ref No: 14/12/16/3/3/2/2009) development site, the owner of this farm portion has a vested interest in the proposed development and associated grid connection infrastructure and would therefore not perceive the proposed power line and substations in a negative light. The remaining sensitive receptor, which is located on the Remainder of the Farm Gats Rivier No 156, is only expected to experience moderate impacts from the proposed development, which is part of an adjacent WEF (DEFF Ref No: 14/12/16/3/3/2/2009) the owner of this farm portion has a vested interest in the proposed development and associated grid connection infrastructure and would therefore not perceive the proposed power line and substations in a negative light.</p> <p>Fifteen (15) potentially sensitive receptors will be subjected to moderate levels of visual impact as a result of the proposed power line development, while one (1) receptor will be subjected to low levels of visual impact.</p> <p>The overall impact rating revealed that the proposed development is expected to have a negative low visual impact rating during construction, operation and decommissioning phases with relatively few mitigation measures available to reduce the visual impact.</p> <p>Several renewable energy developments are being proposed within a 35 km radius of the combined power line assessment corridors and substation sites. These renewable energy developments have the potential to cause large scale visual impacts and the location of several such developments in close proximity to each other could significantly alter the sense of place and visual character in the broader region. It was</p>	<p>experienced from these dwellings. Five of these potentially sensitive receptor locations were however found to be outside the viewshed of the proposed development and thus are not expected to experience any visual impacts as a result of the proposed development, and therefore were removed from the assessment, resulting in only 13 potentially sensitive receptors.</p> <p>The VIA determined that the proposed development will have a high level of impact on one (1) of the sensitive receptors (Remainder of the Farm Baakens Rivier No 155). As this receptor is located on the proposed Oya Energy Facility (DEFF Ref No: 14/12/16/3/3/2/2009) development site, the owner of this farm portion has a vested interest in the proposed development and associated grid connection infrastructure and would therefore not perceive the proposed power line and substations in a negative light. The remaining sensitive receptor, which is located on the Remainder of the Farm Gats Rivier No 156, is only expected to experience moderate impacts from the proposed development, which is part of an adjacent WEF (DEFF Ref No: 14/12/16/3/3/2/2009) the owner of this farm portion has a vested interest in the proposed development and associated grid connection infrastructure and would therefore not perceive the proposed power line and substations in a negative light.</p> <p>Fifteen (15) potentially sensitive receptors will be subjected to moderate levels of visual impact as a result of the proposed power line development, while one (1) receptor will be subjected to low levels of visual impact.</p> <p>The overall impact rating revealed that the proposed development is expected to have a negative low visual impact rating during construction, operation and decommissioning phases with relatively few mitigation measures available to reduce the visual impact.</p> <p>Several renewable energy developments are being proposed within a 35 km radius of the combined power line assessment corridors and substation sites. These renewable energy developments have the potential to cause large scale visual impacts and the location of several such developments in close proximity to each other could significantly alter the sense of place and visual character in the broader region. It was</p>	Indirect Impacts		
		None		
		Decommissioning Phase		
		Direct Impacts		
		<ul style="list-style-type: none"> ▪ Potential visual intrusion resulting from vehicles and equipment involved in the decommissioning process ▪ Potential visual impacts of increased dust emissions from decommissioning activities and related traffic ▪ Potential visual intrusion of any remaining infrastructure on the site 	- Low	- Low
		Indirect Impacts		
		None		
		Cumulative		
		Direct Impacts		
		<ul style="list-style-type: none"> ▪ Potential alteration of the visual character and sense of place in the broader area ▪ Potential visual impact on receptors in the study area 	- Medium	- Medium

Specialist	Key findings	Impacts	Impact pre mitigation	Impact post mitigation
	<p>however determined that only six (6) of these would have any significant impact on the landscape within the study area. These facilities are Kudusberg WEF (14/12/16/3/3/1/1976/AM1) and Oya Energy Facility in the north-eastern sector of the study area and Perdekraal East WEF, Perdekraal West WEF and Tooverberg WEF in the south-west. The concentration of these facilities could potentially alter the inherent sense of place and introduce an increasingly industrial character into a largely rural area, thus giving rise to significant cumulative impacts. In light of this, cumulative impacts have been rated as negative medium during both construction and operation phases of the project. It is however anticipated that these impacts could be mitigated to acceptable levels with the implementation of the recommendations and mitigation measures stipulated for each of these developments by the visual specialists. It is important to note, however, that the study area is located within the REDZ 2, namely the Komsberg REDZ, and thus the relevant authorities support the concentration of renewable energy developments in this area.</p> <p>A comparative assessment of alternatives for the proposed on-site substation sites was undertaken in order to determine which of the alternatives would be preferred from a visual perspective. No fatal flaws were identified for any of the proposed power line corridor alternatives. Power Line Corridor Alternative 3 was identified as the Preferred Alternative, while Power Line Corridor Options 1, 2, 4 and 5 were found to be favourable.</p> <p>From a visual perspective therefore, the proposed Oya 132kV power line and associated substation project is deemed acceptable and the EA should be granted. SIVEST is of the opinion that the visual impacts associated with the construction, operation and decommissioning phases can be mitigated to acceptable levels provided the recommended mitigation measures are implemented</p>	<ul style="list-style-type: none"> ▪ Potential visual impact on the night time visual environment <p style="text-align: center;">Indirect Impacts</p> <p>None</p> <p style="text-align: center;">‘No-Go’</p> <ul style="list-style-type: none"> ▪ Potential alteration of the visual character and sense of place in the broader area ▪ Potential visual impact on receptors in the study area ▪ Potential visual impact on the night time visual environment 	<p style="text-align: center;">NIL</p>	<p style="text-align: center;">- Low</p>

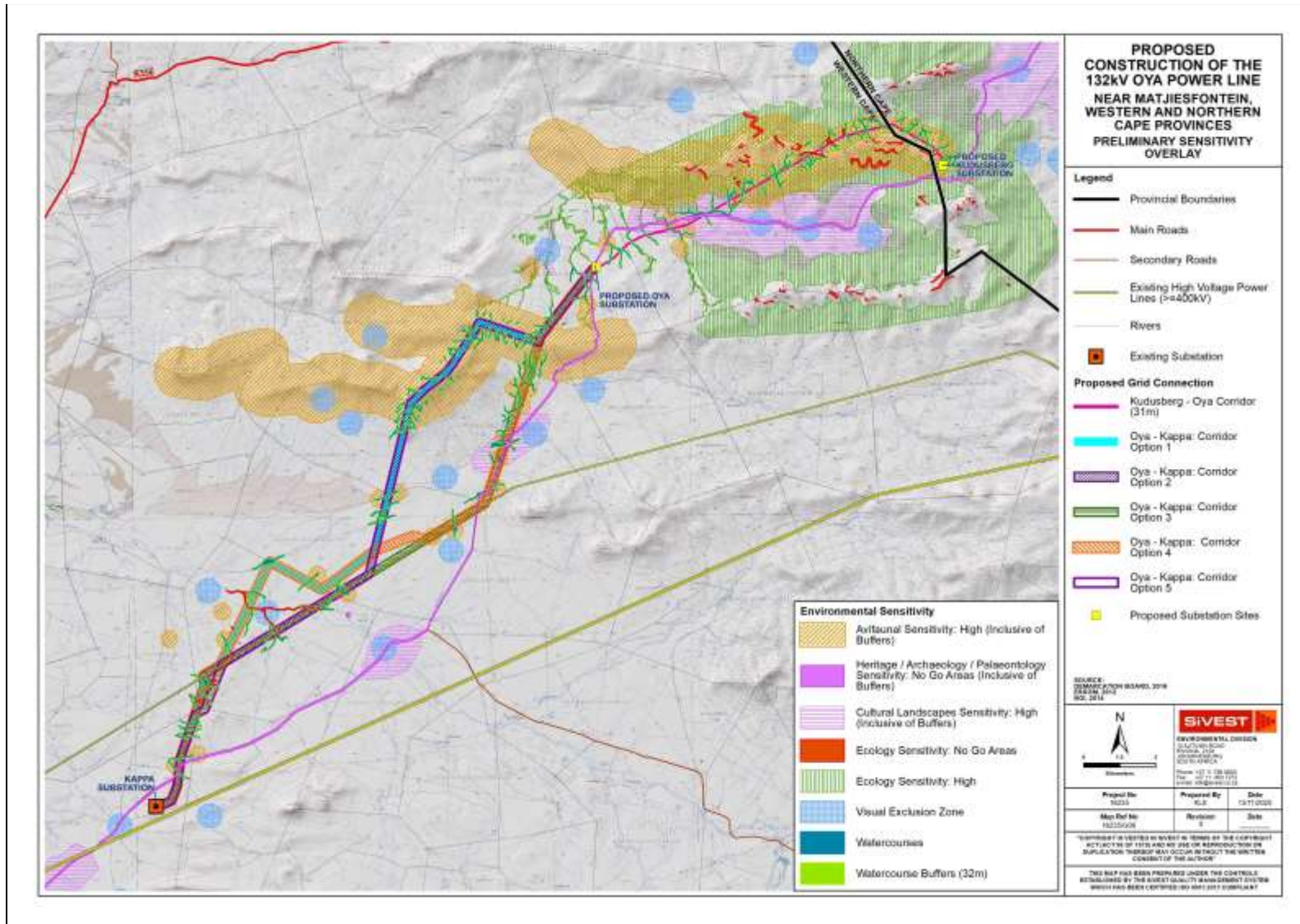


Figure 84: Proposed layout (including alternatives) in relation to environmental sensitive areas

The results of the comparative assessment of alternatives are summarised in **Table 43** below. In addition, the preferred site layout in relation to the sensitive / “no-go” areas identified by the specialists is indicated in **Figure 85** below.

Key

PREFERRED	The alternative will result in a low impact / reduce the impact
FAVOURABLE	The impact will be relatively insignificant
LEAST PREFERRED	The alternative will result in a high impact / increase the impact
NO PREFERENCE	The alternative will result in equal impacts

Table 43: Summary of comparative assessment of layout alternatives

POWER LINE CORRIDOR ROUTE ALTERNATIVES (OYA TO KAPPA)					
Specialists	Power Line Corridor Alternative 1	Power Line Corridor Alternative 2	Power Line Corridor Alternative 3	Power Line Corridor Alternative 4	Power Line Corridor Alternative 5
Surface Water	No preference	No preference	Preferred	Preferred	No preference
Ecology	Least preferred	Least preferred	Preferred	Favourable	Least preferred
Heritage (including Archaeology, Palaeontology and Cultural Landscapes)	Least preferred	Least preferred	Least preferred	Preferred	Least preferred
Visual	Favourable	Favourable	Preferred	Favourable	Favourable
Socio-Economic	No preference	No preference	No preference	No preference	No preference
Agriculture	Preferred	Preferred	Preferred	Preferred	Preferred
Birds	Least preferred	Favourable	Preferred	Least preferred ⁴⁷	Favourable
Fatal Flaw	No	No	No	No	No
PREFERRED (YES / NO)	-	-	-	YES	-

⁴⁷ Despite being “Least Preferred”, this alternative was not found to be fatally flawed, as confirmed by the specialist (see **Appendix 6B**)

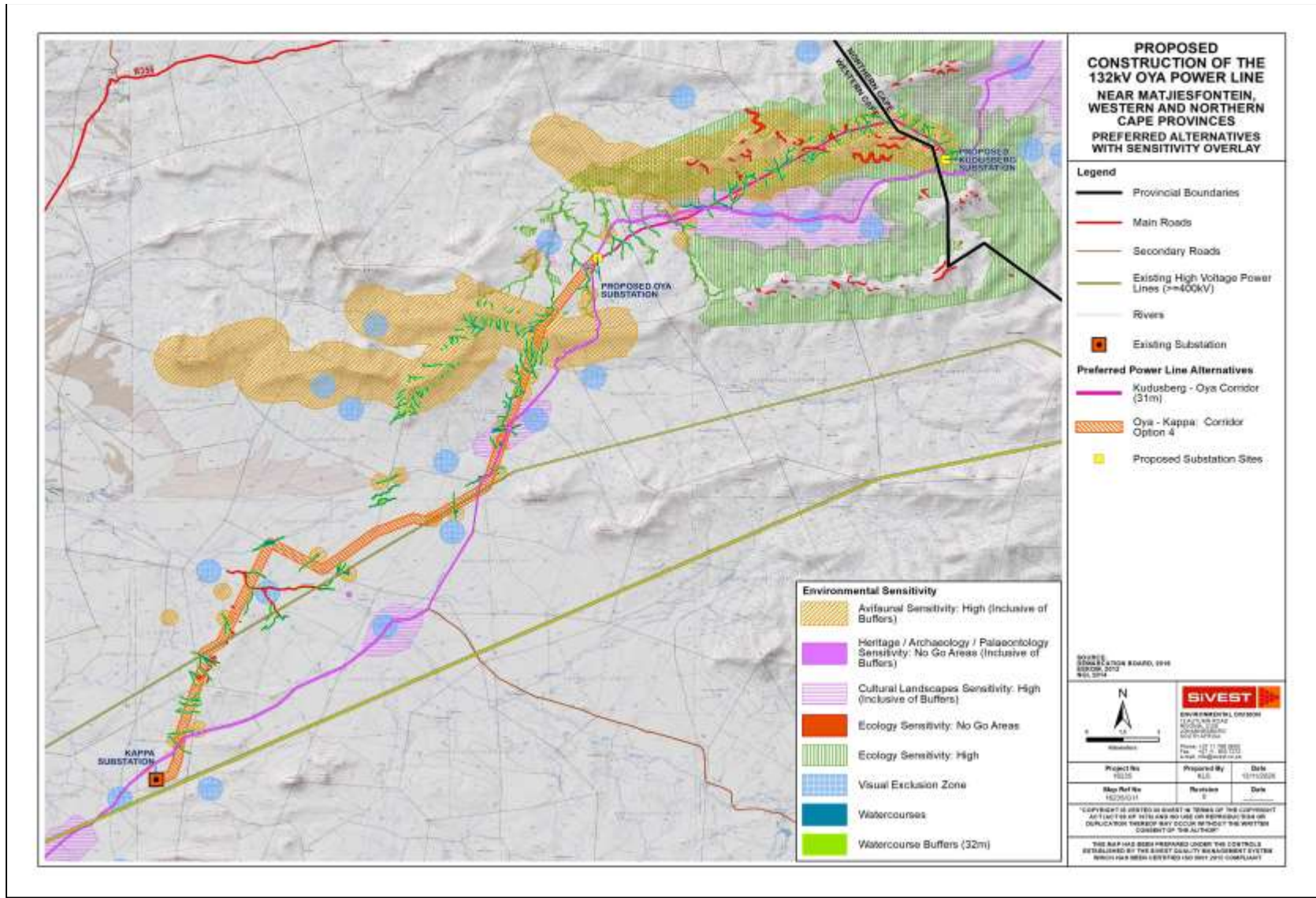


Figure 85: Preferred site layout in relation to identified environmental sensitive areas

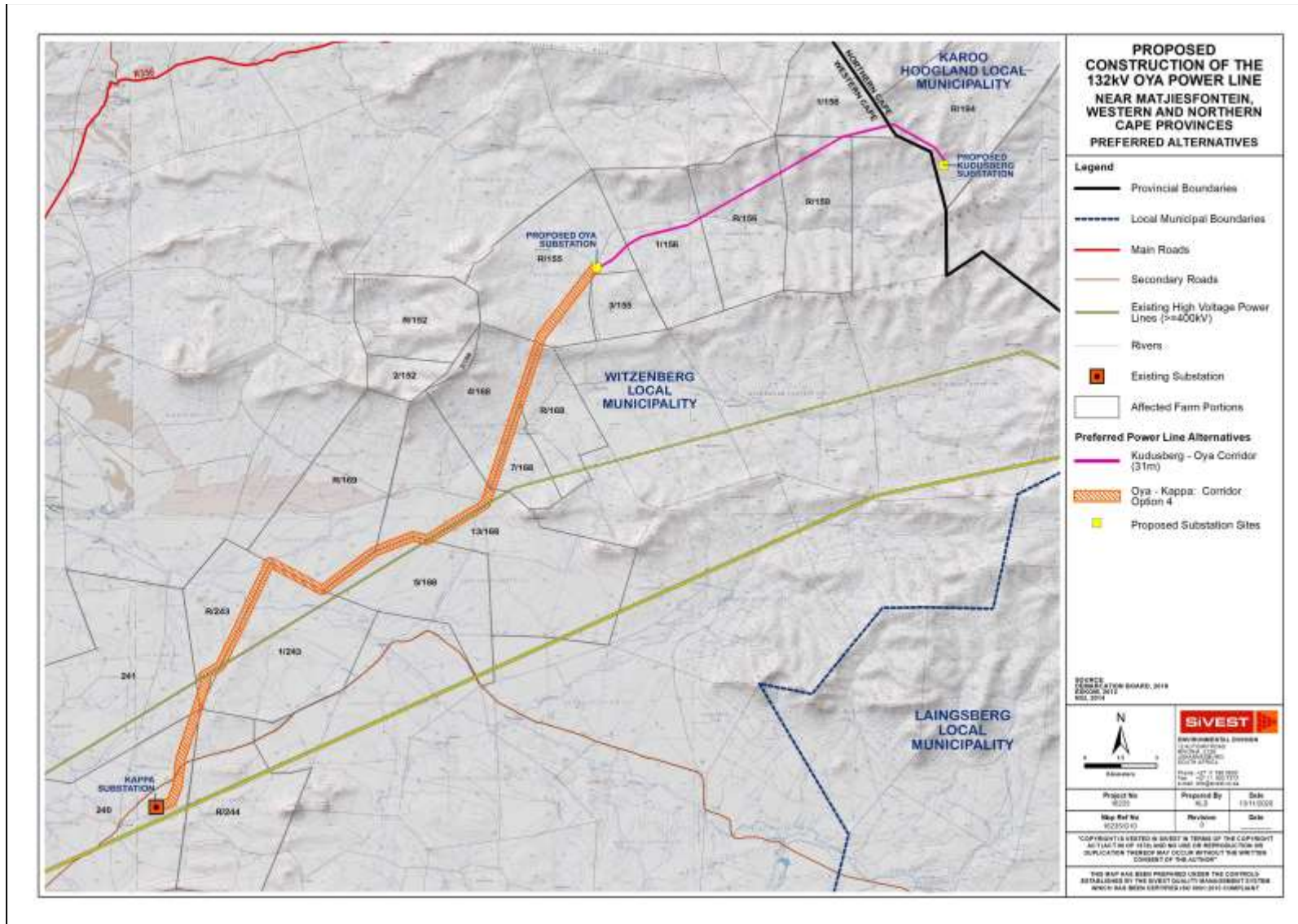


Figure 86: Refined Layout Map

It should be noted that micro-siting may be required within the authorised power line corridors during the detailed design phase. In addition, alignment of the power line within the authorised power line corridors will take the identified sensitive / “no-go” areas into account. This is to enable the avoidance of any unidentified features within the proposed corridors, including those identified as a result of the detailed walkdowns, or any design constraints when the development reaches construction. In addition, routing the power line within the authorised corridors would not be regarded as a change to the scope of work or the findings of the impact assessments undertaken during the BA process. This is based on the understanding that the specialists have assessed the larger area / corridors in detail and all identified sensitive / “no-go” areas have been excluded from the area / corridors, if possible. Therefore, moving the components within the assessed corridors would not change the impact significance. Any changes to the power line route within the boundaries of the authorised corridors following the issuing of the EA (should it be granted) will therefore be considered to be non-substantive.

12.2 Environmental Impact Statement

It is the opinion of the EAP that the information and data provided in this DBAR is sufficient to enable the DEFF to consider all identified potentially significant impacts and to make an informed decision on the application once the FBAR is provided. Furthermore, it is the opinion of the EAP that based on the findings of the BA and the specialist studies, that the proposed development should be granted an EA and allowed to proceed, provided the following conditions are adhered to:

- All mitigation measures recommended by the various specialists must be implemented, where applicable;
- Where applicable, monitoring should be undertaken to evaluate the success of the mitigation measures recommended by the various specialists;
- It is requested that the corridor submitted as part of this DBAR **be approved** by the DEFF; and
- The Final EMP, which will accompany the FBAR, **should be approved** by the DEFF as part of the EA.

SiVEST, as the independent EAP, is therefore of the view that:

- Feasible and practical mitigation measures have been recommended by the various specialists and have been incorporated into the Final Environmental Management Programme (EMP);
- The project location and project description can be authorised based on the findings of the suite of specialist assessments;
- A **power line corridor for the Kudusberg to Oya power line corridor route** has been identified which is environmentally acceptable and will not result in significant impacts, provided that the recommended mitigation measures are implemented and the routing of the power line within the assessed corridor avoids tower placement within the identified sensitive and “no-go” areas;
- An **acceptable power line corridor route alternative for the Oya to Kappa route (i.e. Power Line Corridor Route Alternative 4)** has been identified which is environmentally acceptable and will not result in significant impacts, provided that the recommended mitigation measures are implemented and the routing of the power line within the assessed corridor avoids tower placement within the identified sensitive and “no-go” areas;
- **Preferred on-site substations (namely the Oya on-site Eskom Substation and Kudusberg on-site Eskom Substation)** have been identified which are environmentally acceptable and will not result in significant impacts, provided that the recommended mitigation measures are implemented and the placement of the substation sites avoid the identified sensitive and “no-go” areas;
- A cumulative impact assessment of similar developments in the area was undertaken by the respective specialists. Based on their findings, majority of the cumulative impacts associated

with the proposed development can be kept low after the implementation of mitigation measures, with the exception of Socio-Economic, which will be negative high even after the implementation of mitigation measures. It should however be noted that the Socio-Economic specialist also found there to be Very High positive economic impacts. In addition, some of the specialists (namely Avifauna, Terrestrial Ecology and Heritage) found that the cumulative impacts associated with the proposed development can be kept to Medium after the implementation of mitigation measures. Despite the high cumulative impact from a Socio-Economic perspective, no fatal flaws have been identified and thus the proposed development should proceed from a cumulative impact assessment perspective; and

- Through the implementation of mitigation measures, together with adequate compliance monitoring, auditing and enforcement thereof by the appointed Environmental Control Officer (ECO) as well as the competent authority, the potential detrimental impacts associated with the proposed development can be mitigated to acceptable levels.

The date on which the activity will commence (i.e. enter construction) cannot be determined at this stage. The construction of the proposed power line and substation development is dependent on the Oya Energy Facility (DEFF Ref No.: 14/12/16/3/3/2/2009) and/or Kudusberg WEF (14/12/16/3/3/1/1976/AM1) entering into a PPA with an off taker or being selected as preferred bidder under the DMRE's REIPPPP, RMIPPPP or other government run procurement programmes. The proposed development will therefore require an EA of at least ten (10) years and it is requested that this be taken into consideration within the EA.

It is trusted that the DBAR provides adequate information to the I&APs / stakeholders to provide input and for the competent authority to make an informed decision regarding the proposed development. It should be noted that this section (and namely the Environmental Impact Statement) is deemed to be in line with the requirements of Appendix 1 of the EIA Regulations 2014, as amended, and contains a summary of the key findings of the environmental impact assessment, 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 (**Table 1**, and **Figure 85**) and a summary of the positive and negative impacts and risks of the proposed activity and identified alternatives.

12.3 Decision-Making Authority Consultation

The stages at which the competent authority will be consulted are as follows:

- Pre-application meeting;
- Submission of the DBAR for comment;
- Submission of FBAR for decision-making; and
- Response from competent authority regarding the application.

Additional consultation may occur with the DEFF during the BA process, should the need arise.

12.4 Cumulative Impact Assessment

The potential cumulative impact of the proposed development in combination with other renewable energy facilities (including associated power line and substation infrastructure) within a 35km radius from the proposed development has been identified and assessed per environmental aspect in **section 7.5**.

In addition, mitigation measures were identified to address the cumulative impacts, where possible. The specialist reports included a detailed cumulative impact assessment, including a review of other specialist studies conducted for other renewable energy developments (including associated power line and substation infrastructure) within a 35km radius of the proposed development. It should be noted that the cumulative impact assessment was based on information available at the time of writing this report and as such there may be several other renewable energy projects proposed within the study area. The projects were identified using the DEFF's Renewable Energy EIA Application Database for SA in conjunction with information provided by IPPs operating in the broader region.

The recommendations contained in the specialist reports reflect the mitigation measures provided in the DBAR and EMPr (**Appendix 8**). Cumulative impacts are also rated as part of the impact rating system and have been used to determine the significance of the impacts.

12.5 Environmental Management Programme (EMPr)

In accordance with Appendix 4 of the EIA Regulations, 2014 (as amended), a **Final EMPr** will be included within the FBAR **for review and approval (Appendix 8)**. The EMPr includes the mitigation measures formulated by the various specialists and all information as required in Appendix 4 of the EIA Regulations, 2014 (as amended). The EMPr can be found in **Appendix 8**.

12.6 Public Participation

The Public Participation during the BA process will involve the following:

Table 44: Public Participation activities still to take place

Regulation/ circular	Approach & Methodology to meet requirements
<p>Regulation 40(1), Regulation 40(3) & Regulation 43 – provide all potential or registered interested and affected parties, including the competent authority, access to project related information, access to the BA report which will be made available for a period of at least 30 days to submit comments on draft reports prior to submission of final reports for decision-making.</p>	<p><u>It is the intention to release all relevant project information to all interested and affected parties for a 30-day period.</u></p> <p>Notification of Basic Assessment (BA) process to be undertaken for application for Environmental Authorisation (EA) <u>to be distributed using the following means:</u></p> <ul style="list-style-type: none"> • Issuing of the Background Information Document (BID) and initial landowner consultation (to be circulated to all I&APs in November 2020) (proof to be included in Final BA Report). • Placement of site notices in English and Afrikaans (as per regulations) along the entrance road to the Gatsrivier Holiday Farm (an affected property - Portion 5 of the Farm Bantamsfontein No 168) during a site visit undertaken in November 2020 (33° 2'21.54"S, 20° 7'56.99"E). • Notification letter to be sent via E-mail or sms (if cellphone number / email is available, it is assuming the I&AP have an email or cellphone). • ALL identified I&APs has access to at least email or cellphone (Appendix 1 and Appendix 2) • Public notification of the BA process will be advertised in a local newspaper (namely <i>the Noordwester</i>) as well as a Provincial Newspaper (namely <i>Die Burger</i>), as required according to Regulation 41 (2) (c) of the EIA Regulations (2014), as amended. <p><u>Availability of report for review:</u></p> <ul style="list-style-type: none"> • Report available on the Oya website for free download. • Dedicated data free portal for online stakeholder engagement platform. • Digital Tablet uploaded with the DBAR at the Sutherland Police Station and Witzenberg Local Municipality offices***. • Electronic copies can be made available to parties via a secure digital link that will be emailed upon request for the documentation.

Regulation/ circular	Approach & Methodology to meet requirements			
	<ul style="list-style-type: none"> • CDs / Flash drive to be posted, only if requested⁴⁸. • Digital Tablet** uploaded with the DBAR at the Sutherland Police Station and Witzenberg Local Municipality offices. 			
	The tablet will be located at the following location and will be available for review at the below designated time:			
	Locations	Address	Open Hours	Contact**
	Sutherland Police Station	21 Piet Retief Street Sutherland	8am-5pm for viewing	023-5718040
	Witzenberg Local Municipality	53 Voortrekker Street, Ceres	8am-4pm for viewing	023-3168554
Regulation 40(2) - Provide access to all project information that has the potential to influence any decision regarding the application, unless protected by law,	<p>** In light of the requirements enforced by the Government Gazette 43096 and the limits on the movement and gatherings of people in an effort to curb the spread CoVID-19, Constable Koopman (PSmTis@saps.gov.za) has confirmed that the report will be sanitised after every viewing. There will also be a bottle of hand sanitiser next to the tablet where the user can sanitise themselves and the report as well to prevent the spread of CoVID-19. A site notice will also be placed next to the report detailing the project details and encouraging the public to practice social distance (i.e. one at a time), ensure the wearing of masks and the use of hand sanitiser while viewing the report.</p> <p>** Mr. Hennie Taljaard of the Witzenberg Local Municipality confirmed that he will meet any I&APs wishing to view the digital Tablet in order to explain how the digital Tablet works and to provide assistance (if possible).</p> <p><u>Availability to comment:</u> Comments can be submitted in various mediums detailed in the row below, and will be captured and responded to by the SiVEST PPP Office.</p> <p>*** Where I&APs do not have the applicable facilities i.e. access to internet, mobile phones, or computers, provision will be made for the use of an electronic tablets which will contain the full DBAR, where all members of the communities can view the report.</p> <ul style="list-style-type: none"> • Report will be submitted to the DEFF using the DEFF online portal. • Report will be submitted to OoS and commenting authorities via an agreed electronic platform (via a secure digital link). 			

⁴⁸ The use of postage will only be required should and I&AP request that the documents be sent to them via CD or flash drive. All I&APs and OoS have either email / sms and will be sent an electronic link to the website where the reports can be reviewed or downloaded, as well as a data free portal where the reports can be reviewed. Should any I&APs / stakeholders / OoS request documents via post or courier, this will be indicated and proof will be provided in the BA Report.

Regulation/ circular	Approach & Methodology to meet requirements
<p>and must include consultation with Competent Authority, Organs of State & registered I&APs.</p> <p>Regulation 41(6) – Relevant information available and accessible</p>	<p><u>Availability of report via means described above.</u></p> <p><u>Submission of comments to EAP:</u></p> <ul style="list-style-type: none"> • Comments will be able to be submitted directly to the EAP using the SiVEST sivest_ppp@sivest.co.za email address or cell phone via call, SMS or WhatsApp. • Written comments can also be submitted via email or fax. • This is deemed to be sufficient as all I&APs have either access to email or cellphone. <p>Any comments provided telephonically or via instant message will be transcribed and recorded as formal comments.</p> <p>Provision of project information and consultation via various means including:</p> <ul style="list-style-type: none"> ▪ Telephonic consultation. ▪ Email correspondence. ▪ SMS and/or WhatsApp. ▪ The Dedicated data free portal platform will ensure that I&APs are afforded sufficient opportunity to participate in the project and raise comments on the project with interest in the BA process for the project. This online stakeholder engagement platform which will include the following: <ul style="list-style-type: none"> ○ Background information on the project ○ Project maps (including locality map, layout map, sensitivity map, landowner map, etc.) ○ Photos of the project site and surrounds ○ Presentation providing a summary of the project details and the findings of the BA ○ Posters providing a summary of the findings of the BA ○ A means of submitting written comment or queries. ▪ Virtual meetings, if required, will be conducted using an appropriate platform agreeable to all parties (such as Zoom, Skype or Microsoft Teams). The meeting will be recorded, and the attendees' details captured in an attendance register. Confirmation of their attendance will also be requested by e-mail and the correspondence will be included in the report. <p><i>It should be noted that the use of postage will only be required should and I&AP request that the documents be sent to them via CD or flash drive. All I&APs and OoS have either email / sms and will be sent an electronic link to the website where the reports can be reviewed or downloaded, as well as a data free portal where the reports can be reviewed. Should any I&APs / stakeholders / Oos request documents via post or courier, this will be indicated and proof of postage will be provided in the BA Report. In addition, the project database in the BA Report will reflect whether any I&AP / stakeholder /</i></p>

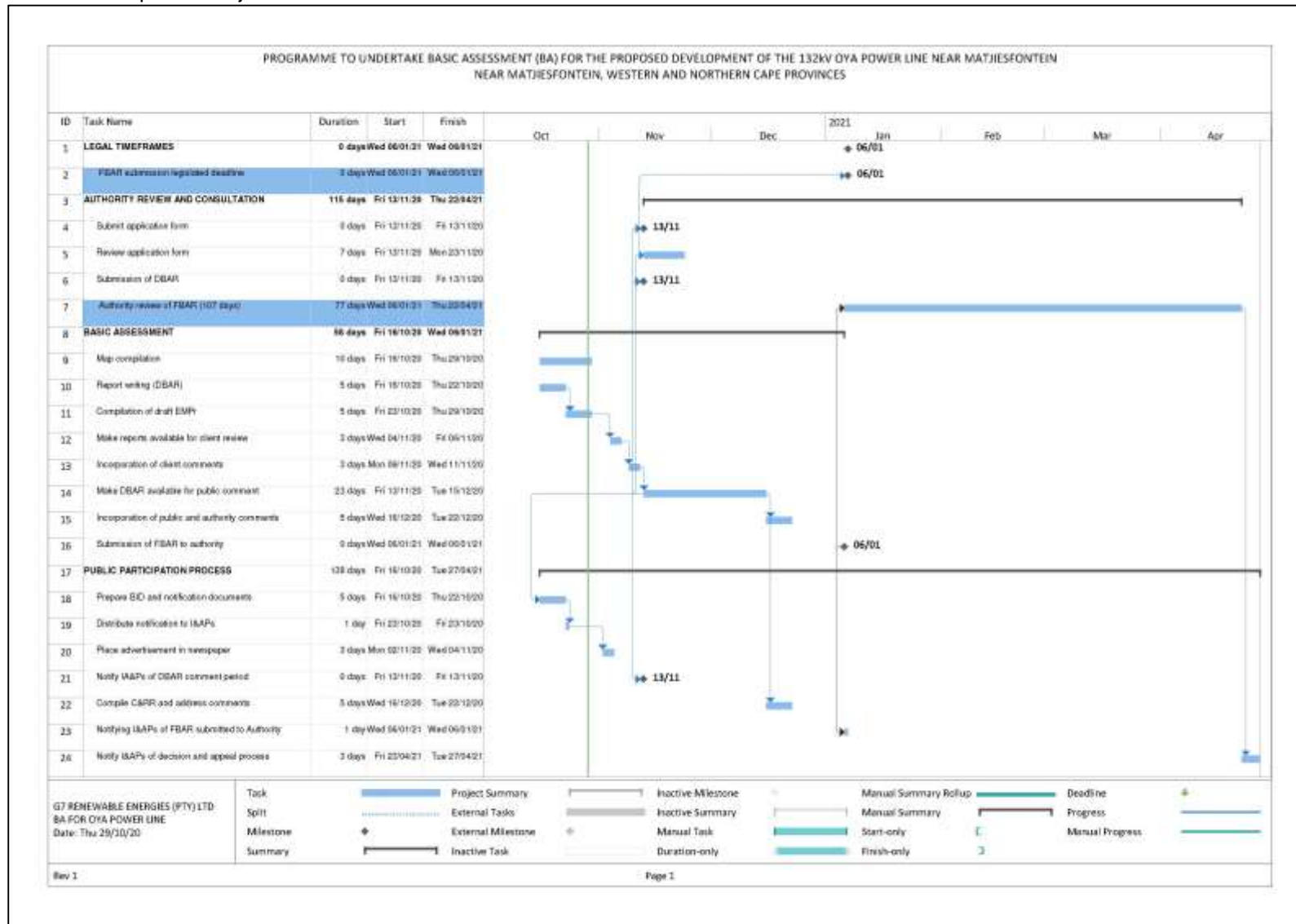
Regulation/ circular	Approach & Methodology to meet requirements
	OoS / Authority received the documents via post or courier.
Regulation 41(2)(a) – Site notice	<ul style="list-style-type: none"> • Placement of site notices in English and Afrikaans (as per regulations) along the entrance road to the Gatsrivier Holiday Farm (an affected property - Portion 5 of the Farm Bantamsfontein No 168) during a site visit undertaken in November 2020 (33° 2'21.54"S, 20° 7'56.99"E). • Size and content is in accordance with Regulation 41(3) & 41(4). • Proof incorporated into the DBAR (Appendix 7A)
Regulation 41(2)(b) – Written notification to affected and neighbouring landowners and occupiers; municipality; ward councilors; Organs of State & other parties required by the CA	<ul style="list-style-type: none"> • Notification letters to all I&APs (Appendix 1 of PP Plan – Appendix 7J) and OoS (Appendix 2 of PP Plan – Appendix 7J) will be sent via email and SMS. • Proof of notifications will be incorporated into the Final BA Reports (Appendix 7B)
Regulation 41(2)(c) – (e) – Advertisements	<ul style="list-style-type: none"> • Public notification of the BA process will be advertised in a local newspaper (namely <i>the Noordwester</i>) as well as a Provincial Newspaper (namely <i>Die Burger</i>), as required according to Regulation 41 (2) (c) of the EIA Regulations (2014), as amended. • Process notices (A4 size) with site notice details will be placed at the Sutherland Police Station and Witzenberg Local Municipality offices**.
Regulation 42 – Project database	<ul style="list-style-type: none"> • I&APs have been identified through a process of networking and referral, obtaining information from the SiVEST existing stakeholder database, the neighboring WEF (14/12/16/3/3/1/1976/AM1) and Oya Energy Facility (14/12/16/3/3/2/2009) database and liaison with potentially affected parties in the greater surrounding area. • OoS, key stakeholders and affected and surrounding landowners have been identified and registered on the project database. • Other stakeholders will be required to formally register their interest in the project through either directly contacting the SiVEST Public Participation team via phone, email or fax or use of the SiVEST or Oya website. • In order to access the Oya Data Free Portal platform for a specific project, I&APs will be required to provide their details such that they are automatically registered on the project database. • The register of I&APs will contain the names of: <ul style="list-style-type: none"> ○ all persons who requested to be registered on the database through the use of the Oya website, or in writing and disclosed their interest in the project; ○ all OoS which hold jurisdiction in respect of the activity to which the application relates; and

Regulation/ circular	Approach & Methodology to meet requirements
	<ul style="list-style-type: none"> ○ all persons who submitted written comments or attended virtual meetings and viewed virtual presentations on the Oya website during the public participation process. ● The information captured on the project database will contain the names, organisation and contact details, as required. <p>All I&APs have access to either email or a cellphone.</p>
Regulation 44 – Comments to be recorded	<ul style="list-style-type: none"> ● Comments will be able to be submitted directly to the EAP using the SiVEST sivest_ppp@sivest.co.za email address or cell phone via call, SMS or WhatsApp. ● Written comments can also be submitted via calls, SMS, WhatsApp, email or fax. ● Any comments provided telephonically or via instant message will be transcribed and recorded as formal comments. ● I&APs without the applicable electronic facilities to access the Oya website will be provided with the opportunity to submit their comments and communicate with the public participation team via SMS, WhatsApp or by sending a Please-call-me notification. These comments will be transcribed and recorded as formal comments. ● All comments received throughout the BA process will be acknowledged and captured in the C&RR, with a relevant response. ● The C&RR will be included in the final report submitted to the CA. <p><i>It should be noted that I&APs / stakeholders / OoS will be notified throughout the BA process to provide comments via the methods mentioned in this PPP. They will also be advised to contact SiVEST directly, if required, in which case other arrangements can be made (if required). SiVEST's public participation email address is monitored on a daily basis to confirm whether any comments or queries have been received. Once a comment is received the project team will save a copy, respond accordingly (using an appropriate method) and the comment / query will also be added to the Comments and Response Report (C&RR) (along with an appropriate response), which will be attached to the BA Report for consideration. SiVEST will also include all proof of correspondence with I&APs, stakeholder and OoS as part of the BA Report, while the project database in the BA Report will reflect whether any I&AP / stakeholder / OoS / Authority received the documents via post or courier.</i></p>
Regulation 4(2) – Notification of decision on application	<p><u>Notification of Environmental Authorisation (EA)</u> using the following means:</p> <ul style="list-style-type: none"> ● Notification letter with details as outlined in the EA issued will be sent via email and SMS (same method used during public consultation described above). ● Notification will be available on the project website, as well as the Data Free Portal.

12.7 Proposed Project Schedule going forward

The table below represents the proposed schedule for the BA process.

Table 45: Proposed Project Schedule



13 WAY FORWARD

The DBAR is currently being circulated for public participation for a period of 30 days⁴⁹ (excluding public holidays) from 13 November 2020 until 14 December 2020. In light of the countrywide restriction enforced in terms of Government Gazette 43096⁵⁰, which has resulted in the entire country being placed in a national state of disaster, which limits the movement and gathering of people in an effort to curb the spread CoVID-19, the public participation process has been amended and adjusted in light of these restrictions. In response, SiVEST has formulated a unique Public Participation process which is as closely related to the requirements of Regulations 39 to 44 of the EIA Regulations, 2014, as amended, (GN R 326) as possible (**Appendix 4**).

SiVEST thus have implemented a virtual and electronic public participation process, in which electronic Tablets will be located at public venues (namely the Sutherland Police Station and Witzenberg Local Municipality offices) in conjunction with a 'data free' website which will be set up in a way where the DBAR can be either viewed and/or downloaded free of charge. Furthermore, an electronic copy will also be made available on a website which is a Data Free Portal (DFP) (to <http://ppp.g7energies.com/K6hqwnjlf87>), whereby all registered I&APs can download the document at no data cost to themselves (see **section 9.8**). This will ensure that all project related information associated with the BA process is readily available and accessible to any person with interest in the project, enabling the public participation process to be undertaken in line with Regulations 41 to 44 of the EIA Regulations, 2014, as amended. All I&APs and key stakeholders, such as OoS / authorities, who are registered on the project database will be notified of the submission of the DBAR and the above-mentioned, DEFF approved, 30-day public review and comment period accordingly. In addition, all OoS / authorities will be sent electronic copies (via email) of the DBAR. The 30-day public review and comment period is provided for the general public and for the I&APs and key stakeholders, as required by the EIA Regulations, 2014 (as amended). It should be noted that A Public Participation Plan (**Appendix 7J**) was compiled by the EAP and was subsequently approved by the DEFF (**Appendix 4** and **Appendix 7J**). All comments received will be responded to in a C&RR, which will be included prior to submission of the FBAR to the decision-making authority, namely the DEFF. Comments received on the DBAR will be taken into consideration, incorporated into the report (where possible) and will be used when compiling the FBAR.

Once the FBAR has been submitted and the DEFF have acknowledged receipt thereof, a decision to either grant or refuse the EA for the proposed development will be made by the DEFF. In addition, once a decision regarding the EA has been received from the DEFF, all registered I&APs, stakeholders and OoS / authorities will be notified accordingly and provided details regarding the appeal process. The BA process will thus come to an end once appeals (if any) have been dealt with adequately and the appeal process closes.

⁴⁹ DEFF have approved a 30-day Public Participation Process (Refer to **Appendix 7J** – Additional information).

⁵⁰ General Notice issued by DEFF on 24 March 2020, as well as Government Notice No. 650 issued by DEFF on 05 June 2020, were being adhered to during Level 3 of national lockdown period. However, during a meeting held with SAWEA on 25 August 2020, DEFF indicated that the Directive issued by the Department on 05 June 2020 (Government Gazette 43412) relating to level 3 lockdown, has been repealed, based on the current lockdown level. Therefore, as it stands, there is no indication that a new directive will be issued, and the "normal" EIA Regulations are currently in force. DEFF however highlighted that Applicants must continue to adhere to the applicable provisions of the Disaster Management Act and associated Regulations (e.g. restrictions on gatherings for public meetings) and hence some elements included in the lockdown directive (05 June 2020 - Government Gazette 43412), mainly as it pertains to PPP, are still relevant and that this directive can be used as a consultation guide for all new applications. Applicant will thus continue to adhere to applicable provisions of Disaster Management Act and associated Regulations

All I&APs and key stakeholders will be provided with an opportunity to participate in the BA process through the public participation process which will be undertaken during the BA process.

All I&APs and key stakeholders are invited to register as I&APs in order to be kept informed throughout the process. To register as an I&AP / stakeholder and/or to obtain additional information, please submit your name, contact details (telephone number, postal address and email address) and the interest which you have in the application to SiVEST Environmental Division, as per the details below:

Contact: Hlengiwe Ntuli or Stephan Jacobs

✉ PO Box 2921, RIVONIA, 2128

☎ Phone: (011) 798 0600

✉ E-mail: hlengiwen@sivest.co.za / stephanj@sivest.co.za / sivest_ppp@sivest.co.za

☎ Fax:(011) 803 7272

Websites: www.sivest.co.za

Please reference “*Oya Grid*” in your correspondence. SiVEST shall keep all registered I&APs / key stakeholders informed of the BA process.

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