

**SOCIAL IMPACT ASSESSMENT  
FOR  
KARREEBOSCH POWER LINE AND  
SUBSTATION  
NORTHERN AND WESTERN CAPE  
PROVINCE**

**OCTOBER 2022**

**Prepared for**

**WSP**

**by**

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## **EXECUTIVE SUMMARY**

### **INTRODUCTION AND LOCATION**

Tony Barbour was appointed by WSP on behalf of Karreebosch Wind Farm RF (Pty) Ltd (the applicant), to undertake a Social Impact Assessment (SIA) as part of the Basic Assessment (BA) process for the establishment of a 132kV overhead powerline (OHPL), 33/132kV substation and associated infrastructure to connect the proposed Karreebosch Wind Energy Facility (WEF) to the national grid via the existing Eskom Komsberg substation. Six alternative options have been identified, namely Option 1A-1C and Option 2A-2C. Option 1A-1C are associated with Substation Option 1. Option 2A-2C are associated with Substation Option 2. The majority of each of the six alternatives are located in the Northern Cape Province with a smaller section located in the Western Cape Province. The study area is located within the Komsberg Renewable Energy Zone (REDZ) and Central Transmission Corridor.

This report contains the findings of the Social Impact Assessment (SIA) Report undertaken as part of the BA process.

### **SITE SENSITIVITY VERIFICATION**

Where a specialist assessment is required and no specific environmental theme protocol has been prescribed (as per Government Gazette 43110, 20 March 2020), the required level of assessment must be based on the findings of the site sensitivity verification and must comply with Appendix 6 of the EIA Regulations.

In accordance with GN 320 and GN 1150 of the NEMA EIA Regulations of 2014, prior to commencing with a specialist assessment, a site sensitivity verification must be undertaken to confirm the current land use and environmental sensitivity of the proposed project area as identified by the National Web-Based Environmental Screening Tool (Screening Tool).

No preliminary socio-economic sensitivities or sensitivity rating was identified or provided based on the DFFE Screening Tool (i.e. a preliminary sensitivity rating was not provided that could then be confirmed or altered based on further assessment).

Nevertheless, this assessment report contains a detailed assessment of the socio-economic impacts of the proposed project. As such, it provides all the necessary information and assessment data to provide an opinion on the sensitivity rating of the site. In particular, Section 4 and Section 5 of the report speaks to social sensitivities identified of the site as confirmed by a site visit undertaken in 2021.

### **SUMMARY OF KEY FINDINGS**

The key findings of the study are summarised under the following sections:

- Fit with policy and planning.

- Construction phase impacts.
- Operational phase impacts.
- Cumulative impacts.
- Decommissioning phase impacts.
- No-development option.

## **FIT WITH POLICY AND PLANNING**

The development of renewable energy and the associated energy infrastructure is strongly supported at a national, provincial, and local level. The development of and investment in renewable energy and associated energy distribution infrastructure is supported by the National Development Plan (NDP), New Growth Path Framework and National Infrastructure Plan, which all highlight the importance of energy security and investment in energy infrastructure. The proposed powerline is also located within the Kombserg Renewable Energy Development Zone (REDZ) and Central Transmission Corridor<sup>1</sup>. The area has therefore been identified as suitable for the establishment of renewable energy facilities and the associated grid infrastructure. The development of the proposed power line is therefore supported by key policy and planning documents.

## **CONSTRUCTION PHASE**

The key social issues associated with the construction phase include:

### **Potential positive impacts**

- Creation of employment and business opportunities, and the opportunity for skills development and on-site training.

The construction phase will extend over a period of approximately 3-6 months and create in the region of 20-30 employment opportunities. The total wage bill will be in the region of R 1.8 million (2022 Rand values). Most of the low and semi-skilled employment opportunities are likely to benefit residents from local towns in the area, including Matjiesfontein, Laingsburg and Sutherland. Most the beneficiaries are likely to be historically disadvantaged (HD) members of the community. This would represent a short term positive social benefit in an area with limited employment opportunities. A percentage of the wage bill will be spent in the local economy which will also create opportunities for local businesses in the Karoo Hoogland Municipality and Laingsburg Municipality.

The capital expenditure associated with the construction of power line will be ~18 million (2022 Rand values) and will create opportunities for the local and regional economy. The sector of the local economy most likely to benefit from the proposed development is the local service industry. The potential opportunities for the local service sector would be linked to accommodation, catering, cleaning, transport, and security, etc. associated with the construction workers on the site. However, given the relatively small scale of the development and short construction period, the benefits will be limited.

### **Potential negative impacts**

- Impacts associated with the presence of construction workers on local communities.
- Noise, dust, and safety impacts of construction related activities and vehicles.

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<sup>1</sup> (GN) No. 113.

- Risk of veld fires.
- Risks posed to farming activities by construction workers.

The findings of the SIA indicate that the significance of the potential negative impacts is likely to be negligible. With mitigation, they are rated as **Low Negative**. The potential negative impacts associated with the proposed construction of the power line and substation can therefore be effectively mitigated if the recommended mitigation measures are implemented. However, experience with the construction of WEFs in the area is that despite measures being in place, these measures are not being implemented effectively by the contractors working in the area. This will need to be addressed. Table 1 summarises the significance of the impacts associated with the construction phase.

**Table 1: Summary of social impacts during construction phase**

<b>Impact</b>	<b>Significance No Mitigation / Enhancement</b>	<b>Significance With Mitigation / Enhancement</b>
<b>Creation of employment and business opportunities</b>	Low (Positive)	Moderate (Positive)
<b>Presence of construction workers and potential impacts on family structures and social networks</b>	Low (Negative)	Low (Negative)
<b>Impact of construction activities and vehicles</b>	Low (Negative)	Low (Negative)
<b>Risk of veld fires</b>	Moderate Negative)	Low (Negative)
<b>Safety risk, stock theft and damage to farm infrastructure associated with presence of construction workers</b>	Moderate Negative)	Low (Negative)

## **OPERATION PHASE**

The benefits associated with the Karreebosch WEF are dependent upon being able to connect to the national grid. The key social issues associated with the operational phase include:

### **Potential positive impacts**

- Improved energy security and establishment of energy infrastructure.
- Creation of employment, skills development, and procurement opportunities.
- Generate income for landowners.

### **Potential negative impacts**

- The visual impacts and associated impact on sense of place.
- Impact of maintenance activities on farming activities and operations.
- Impact on property values.
- Impact on tourism.

The findings of the SIA indicate that the significance of the potential negative impacts is likely be **Low Negative** if the required mitigation measures are effectively implemented. The only proposed alternative regarded as unsuitable by the affected landowners was the section of Alternative 2C that traverses comparatively lower-lying terrain located to the west of the Tankwa River (near its source). The alignment is located particularly close to the river on Ek Kraal 199/1 and Ek Kraal 199/RE and traverses cropped areas on the latter. The owner of Ek Kraal 199/RE indicated that the alignment of Alternative 2C would affect historically cropped areas that had the potential for future cultivation. No concerns were raised regarding the substation options.

The significance of the impacts associated with the operational phase are summarised in Table 2.

**Table 2: Summary of social impacts during operational phase**

<b>Impact</b>	<b>Significance No Mitigation / Enhancement</b>	<b>Significance With Mitigation / Enhancement</b>
<b>Improve energy security and establishment of energy infrastructure</b>	Moderate (Negative) <sup>2</sup>	Moderate (Positive) <sup>3</sup>
<b>Creation of employment and business opportunities during maintenance</b>	Low (Positive)	Moderate (Positive)
<b>Generate income for landowners</b>	Low (Positive)	Moderate (Positive)
<b>Visual impact and impact on sense of place</b>	Low (Negative)	Low (Negative)
<b>Safety risk, stock theft and damage to farm infrastructure associated with presence of maintenance workers</b>	Moderate (Negative)	Low (Negative)
<b>Impact on property values</b>	Low (Negative)	Low (Negative)
<b>Impact on tourism</b>	Low (Negative)	Low (Negative)

### **CUMULATIVE IMPACT ON SENSE OF PLACE**

There are a number of existing power lines in the area associated with the existing 400kV Komsberg substation. The potential for cumulative impacts associated with combined visibility (whether two or more power lines will be visible from one location) and sequential visibility (e.g., the effect of seeing two or more power lines along a single journey, e.g., road or walking trail) does therefore exist. However, the cumulative impact on the area’s sense of place is likely to be low. The area also falls within the Komsberg REDZ and Central Transmission Corridor. The area has therefore been identified as suitable for the establishment of the grid infrastructure.

### **NO-DEVELOPMENT OPTION**

The No-Development option would represent a lost opportunity for South Africa to improve energy security and supplement its current energy needs with flexible and cleaner (compared to coal) energy. Given South Africa’s current energy security challenges and its position as one of the highest per capita producers of carbon emissions in the world, this would represent a negative social cost.

### **CONCLUSION AND RECOMMENDATIONS**

#### ***Conclusion***

The energy security benefits associated with the proposed Karreebosch WEF are dependent upon it being able to connect to the national grid via the establishment of grid connection infrastructure.

<sup>2</sup> Assumes power line is not developed

<sup>3</sup> Assumes power line is developed

The findings of the SIA indicate that the significance of the potential negative social impacts for both the construction and operational phase of the proposed 132 kV Karreebosch overhead power line, 33/132kV onsite substation and associated infrastructure are **Low Negative** with mitigation. The potential negative impacts can therefore be effectively mitigated if the recommended mitigation measures are implemented. The power line is also located within the Komsberg REDZ and Central Transmission Corridor. The establishment of the proposed 132 kV Karreebosch overhead power line and 33/132kV substation is therefore supported by the findings of the SIA.

All the powerline route options were regarded as acceptable by the affected landowners except for the section of Alternative 2C located close to the headwaters of the Tankwa River on Ek kraal 199/1 and which traverses cropped areas on Ek Kraal 199/RE. The concerns are linked to potential impacts on the Tankwa River and productive farmland. The options associated with substation Option 1 (Option 1A-1C) are preferable to the options associated with substation Option 2 (Option 2A-2C). This is due to the shorter distances involved.

***Recommendations***

Based on the findings of the SIA, Option 1A, the preferred option, is supported.

## CONTENTS OF THE SPECIALIST REPORT – CHECKLIST

<b>Regulation GNR 326 of 4 December 2014, as amended 7 April 2017, Appendix 6</b>	<b>Section of Report</b>
(a) details of the specialist who prepared the report; and the expertise of that specialist to compile a specialist report including a <i>curriculum vitae</i> ;	Section 1.5, Annexure A
(b) a declaration that the specialist is independent in a form as may be specified by the competent authority;	Section 1.6, Annexure B
(c) an indication of the scope of, and the purpose for which, the report was prepared;	Section 1.1, Section 1.2
(cA) an indication of the quality and age of base data used for the specialist report;	Section 1.2, Section 3,
(cB) a description of existing impacts on the site, cumulative impacts of the proposed development and levels of acceptable change;	Section 4
(d) the duration, date and season of the site investigation and the relevance of the season to the outcome of the assessment;	Interviews in 2021 (Annexure A)
(e) a description of the methodology adopted in preparing the report or carrying out the specialised process inclusive of equipment and modelling used;	Section 1.2, Annexure B
(f) details of an assessment of the specific identified sensitivity of the site related to the proposed activity or activities and its associated structures and infrastructure, inclusive of a site plan identifying site alternatives;	Section 4, Section 5,
(g) an identification of any areas to be avoided, including buffers;	Section 4
(h) a map superimposing the activity including the associated structures and infrastructure on the environmental sensitivities of the site including areas to be avoided, including buffers;	N/A
(i) a description of any assumptions made and any uncertainties or gaps in knowledge;	Section 1.4,
(j) a description of the findings and potential implications of such findings on the impact of the proposed activity, including identified alternatives on the environment, or activities;	Section 4, Section 5
(k) any mitigation measures for inclusion in the EMPr;	Section 4
(l) any conditions for inclusion in the environmental authorisation;	Section 4, Section 5
(m) any monitoring requirements for inclusion in the EMPr or environmental authorisation;	N/A
(n) a reasoned opinion— i. as to whether the proposed activity, activities or portions thereof should be authorised; iA. Regarding the acceptability of the proposed activity or activities; and ii. if the opinion is that the proposed activity, activities or portions thereof should be authorised, any avoidance, management and mitigation measures that should be included in the EMPr or Environmental Authorization, and where applicable, the closure plan;	Section 5.3
(o) a description of any consultation process that was undertaken during the course of preparing the specialist report	Annexure A, lists key stakeholders interviewed
(p) a summary and copies of any comments received during any consultation process and where applicable all responses thereto; and	Annexure A, lists key stakeholders interviewed
(q) any other information requested by the competent authority	N/A
Where a government notice gazetted by the Minister provides for any protocol or minimum information requirement to be applied to a	Comply with the Assessment Protocols that were published



<b>Regulation GNR 326 of 4 December 2014, as amended 7 April 2017, Appendix 6</b>	<b>Section of Report</b>
<p>specialist report, the requirements as indicated in such notice will apply.</p>	<p>on 20 March 2020, in Government Gazette 43110, GN 320. This specifically includes Part A, which provides the Site Sensitivity Verification Requirements where a Specialist Assessment is required but no Specific Assessment Protocol has been prescribed. As at September 2020, there are no sensitivity layers on the Screening Tool for Socio-economic-features. Part A has therefore not been compiled for this assessment.</p>

## ACRONYMS

DEA&DP	Department of Environmental Affairs and Development Planning
ECO	Environmental Control Officer
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
IDP	Integrated Development Plan
IPP	Independent Power Producer
kV	Kilovolts
KH	Karoo Hoogland
KHM	Karoo Hoogland Municipality
LM	Laingsburg Municipality
LED	Local Economic Development
MW	Megawatt
OHPL	Overhead Powerline
PGWC	Provincial Government Western Cape
PSDF	Provincial Spatial Development Framework
REDZ	Renewable Energy Development Zone
REIPPPP	Renewable Energy Independent Power Producers Procurement Programme
SDF	Spatial Development Framework
SIA	Social Impact Assessment
SWOT	Strengths, Weakness, Opportunities and Threats
WEF	Wind Energy Facility

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# SECTION 1: INTRODUCTION

## 1.1 INTRODUCTION

Tony Barbour was appointed by WSP to undertake a Social Impact Assessment (SIA) on behalf of Karreebosch Wind Farm RF (Pty) Ltd (the applicant), as part of the Basic Assessment (BA) process for the establishment of an overhead powerline to connect the proposed Karreebosch Wind Energy Facility (WEF) to the national grid via the existing Eskom Komsberg substation. Six alternative options have been identified, namely Option 1A-1C and Option 2A-2C. Option 1A-1C are associated with Substation Option 1. Option 2A-2C are associated with Substation Alternative 2.

The majority of each of the six alternatives are located in the Northern Cape Province with a smaller section located in the Western Cape Province (Figure 1.1). The entire extent of the proposed 132kV Karreebosch overhead powerline (OHPL), 33/132kV Substation and associated infrastructure is located within one (1) of the Strategic Transmission Corridors, namely the Central Corridor, as defined in and in terms of the procedures laid out in Government Notice (GN) No. 113.

This report contains the findings of the Social Impact Assessment (SIA) Report undertaken as part of the BA process.



Figure 1.1: Location of Karreebosch Powerline options (purple)

## 1.2 APPROACH TO STUDY

The approach to the SIA study is based on the Western Cape Department of Environmental Affairs and Development Planning Guidelines for Social Impact Assessment (DEADP, 2007). The key activities undertaken as part of the SIA process as embodied in the guidelines included:

- Describing and obtaining an understanding of the proposed intervention (type, scale, and location), and the community, land uses and activities that may be affected by the proposed project.
- Collecting baseline data on the current social and economic environment.
- Review of key policy and planning documents that have a bearing on the project.
- Site visit and interviews with key stakeholders.
- Identifying the key potential social issues associated with the proposed project.
- Assessing and assessing the significance of social impacts associated with the proposed project.
- Identification of enhancement and mitigation measures aimed at maximizing opportunities and avoiding and or reducing negative impacts.

## 1.3 PROJECT DESCRIPTION

The Karreebosch OHPL will be routed from the proposed onsite Karreebosch 33/132kV substation associated with the approved Karreebosch WEF (EA Ref: 14/12/16/3/3/2/807/AM3 which is currently undergoing a Part 2 EA amendment, final layout and EMPr approval process), to the existing Bon Espirange substation, after which it will connect to the existing 400kV Komsberg substation. The OHPL will consist of a 132kV twin tern double circuit overhead powerline. The powerline towers will either be steel lattice or monopole structures. Two alternative 33/132kV onsite substation locations for the Karreebosch WEF site have been identified, namely Substation Option 1 and Substation Option 2 (Figure 1.2):

The proposed OHPL will link either one of these substation options to the existing Bon Espirange and Komsberg substations.

Six (6) OHPL route alternatives have been identified. Alternatives 1A-C feed out of Substation Option 1 proposed in the south-central portion of the Farm Klipbanks Fontein 198/1. Alternatives 2A-C feed out of Substation Option 2 proposed in the south-eastern corner of Wilgebosch Rivier 188/RE.

Only one (1) OHPL route is technically feasible for the section of the proposed powerline directly preceding the existing Bon Espirange Substation (Route 3) and for the section connecting the Bon Espirange substation to the Komsberg substation (Bon Espirange to Komsberg Route), which is approximately 9.2 km in length. No alternatives can therefore be provided for these two sections of the OHPL (Route 3 and Bon Espirange to Komsberg Route, as per Figure 1.2 below).

**OHPL Route Option 1:** Three (3) OHPL route alternatives are being considered for the link between Substation Option 1 and the Bon Espirange Substation and Komsberg Substation, namely (Figure 1.2):

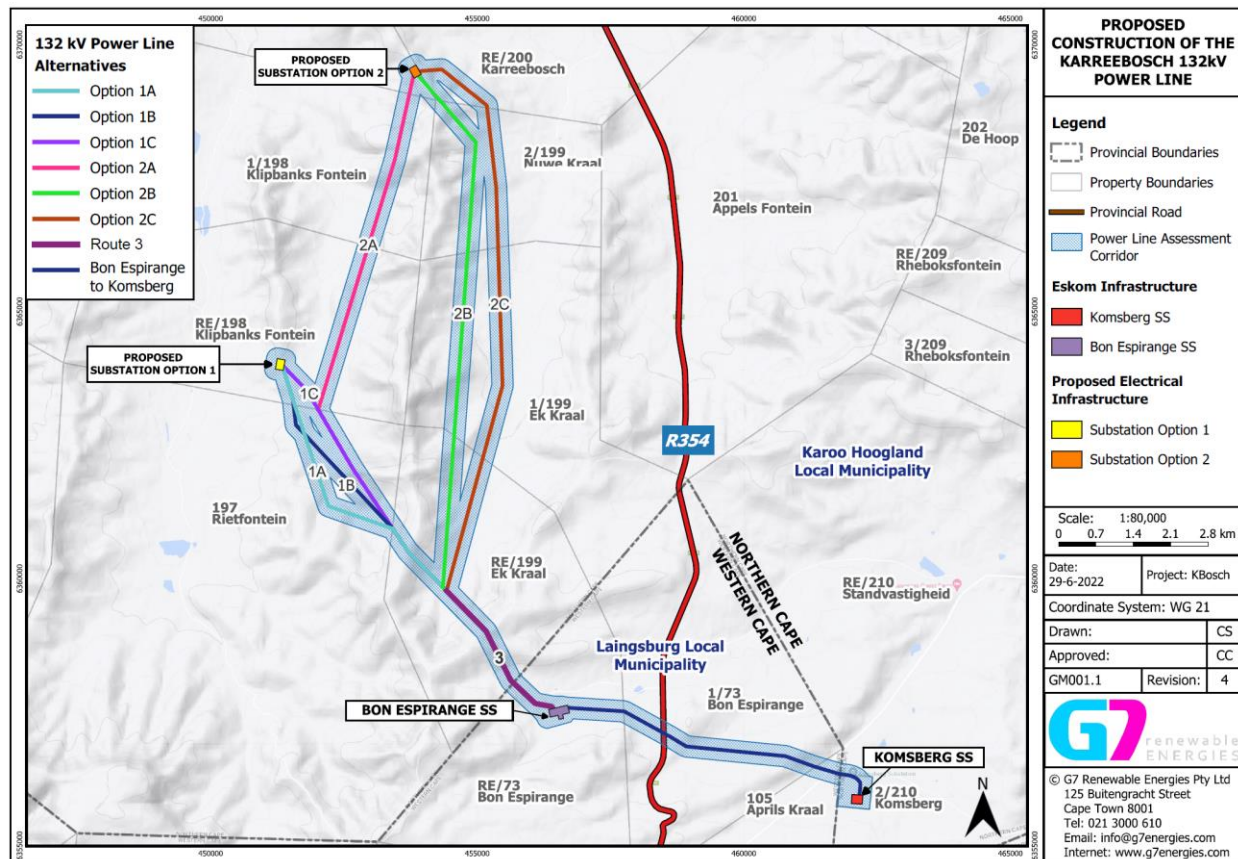
- Option 1A (approximately 14.51 km in length in its entirety from Substation Option 1 to the Komsberg Substation).

- Option 1B (approximately 17.28 km in length in its entirety from Substation Option 1 to the Komsberg Substation).
- Option 1C (approximately 13.91 km in length in its entirety from Substation Option 1 to the Komsberg Substation).

Option 1A is the preferred OHPL option.

**OHPL Route Option 2:** Three (3) powerline corridor route alternatives were considered for the link between Substation Option 2 and the Bon Espirange Substation and Komsberg Substation, namely (Figure 1.2):

- Option 2A (approximately 20.47 km in length in its entirety from Substation Option 1 to the Komsberg Substation).
- Option 2B (approximately 16.63 km in length in its entirety from Substation Option 1 to the Komsberg Substation).
- Option 2C (approximately 20.52 km in length in its entirety from Substation Option 1 to the Komsberg Substation).



**Figure 1.2: Powerline Route and Substation Alternatives for the Karreebosch OHPL**

## **1.4 ASSUMPTIONS AND LIMITATIONS**

### **1.4.1 Assumptions**

#### **Strategic importance of the project**

The strategic importance of promoting renewable energy and associated grid infrastructure is supported by the national and provincial energy policies. The power line route is also located within Komsberg REDZ and Central Transmission Corridor. However, this does not mean that site related issues can be ignored or overlooked.

#### **Fit with planning and policy requirements**

Legislation and policies reflect societal norms and values. The legislative and policy context therefore plays an important role in identifying and assessing the potential social impacts associated with a proposed development. In this regard a key component of the SIA process is to assess the proposed development in terms of its fit with key planning and policy documents. As such, if the findings of the study indicate that the proposed development in its current format does not conform to the spatial principles and guidelines contained in the relevant legislation and planning documents, and there are no significant or unique opportunities created by the development, the development cannot be supported. However, the study recognises the strategic importance of renewable energy and the technical, spatial and land use constraints required for renewable energy facilities.

As the route is located within the Komsberg REDZ and Central Transmission Line Corridor, the area has therefore been identified as being suitable for the establishment renewable energy facilities and associated grid infrastructure.

### **1.4.2 Limitations**

#### **Demographic data**

The information contained in some key policy and land use planning documents, such as Integrated Development Plans etc., may not contain data from Community Household Survey if 2016. However, this will not have a material impact on the findings of the study.

## **1.5 SPECIALIST DETAILS**

Tony Barbour, the lead author of this report, is an independent specialist with 28 years' experience in the field of environmental management. In terms of SIA experience Tony Barbour has undertaken in the region of 260 SIAs and is the author of the Guidelines for Social Impact Assessments for EIA's adopted by the Department of Environmental Affairs and Development Planning (DEA&DP) in the Western Cape in 2007. Annexure C contains a copy of Tony Barbour's CV.

Schalk van der Merwe, the co-author of this report, has an MPhil in Environmental Management from the University of Cape Town and has worked closely with Tony Barbour over the last seventeen years.

## **1.6 DECLARATION OF INDEPENDENCE**

This confirms that Tony Barbour and Schalk van der Merwe, the specialist consultants responsible for undertaking the study and preparing the SIA Report, are independent and do not have any vested or financial interests in the proposed power line being either approved or rejected. Annexure D contains a signed declaration of independence.



## **1.7 REPORT STRUCTURE**

The report is divided into five sections, namely:

- Section 1: Introduction.
- Section 2: Policy and planning context.
- Section 3: Overview of study area.
- Section 4: Identification and assessment of key issues.
- Section 5: Summary of key findings.

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## SECTION 2: POLICY AND PLANNING CONTEXT

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### 2.1 INTRODUCTION

Legislation and policy embody and reflect key societal norms, values, and developmental goals. The legislative and policy context therefore plays an important role in identifying, assessing, and evaluating the significance of potential social impacts associated with any given proposed development. An assessment of the “policy and planning fit<sup>4</sup>” of the proposed development therefore constitutes a key aspect of the Social Impact Assessment (SIA). In this regard, assessment of “planning fit” conforms to international best practice for conducting SIAs. Furthermore, it also constitutes a key reporting requirement in terms of the applicable Western Cape Department of Environmental Affairs and Development Planning’s *Guidelines for Social Impact Assessment* (2007).

The proposed grid connection infrastructure is linked to the proposed Karreebosch WEF. The review therefore includes reference to key policy documents that have a bearing on renewable energy. Most of the site is located within the Western Cape Province, with a small portion falling within the Northern Cape. At the local level the focus of the review has been on Local Municipal level policy and planning documents.

- National Development Plan (2011).
- New Growth Path Framework (2010).
- National Infrastructure Plan (2012).
- Integrated Energy Plan (2019).
- Strategic Environmental Assessment (SEA) for wind and solar PV energy in South Africa (CSIR, 2015)
- The Western Cape Provincial Spatial Development Framework (2014).
- The Western Cape Infrastructure Framework (2013).
- Northern Cape Provincial Growth and Development Plan (NCPGDP) – Vision 2040
- Karoo Hoogland Integrated Development Plan (IDP) (2017-2022).
- Karoo Hoogland Spatial Development Framework (SDF) (2015).
- Laingsburg Integrated Development Plan (IDP) (2017-2022).
- Laingsburg Spatial Development Framework (SDF) (2019).
- Laingsburg Local Economic Development Strategy (2019-2029).

### 2.2 NATIONAL DEVELOPMENT PLAN

The National Development Plan aims to eliminate poverty and reduce inequality by 2030. The NDP identifies a number of enabling milestones. Of relevance to the proposed development the NDP refers to the need to produce sufficient energy to support industry at competitive prices and ensure access for poor households, while reducing carbon emissions per unit of power by about one-third. In this regard the infrastructure is not just essential for faster economic growth and higher employment. It also promotes inclusive growth, providing

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<sup>4</sup> “Planning fit” can simply be described as the extent to which any relevant development satisfies the core criteria of appropriateness, need, and desirability, as defined or circumscribed by the relevant applicable legislation and policy documents at a given time.

citizens with the means to improve their own lives and boost their incomes. Infrastructure is essential to development.

Chapter 3, Economy and Employment, identifies some of the structural challenges specific to South Africa, including an energy constraint that will act as a cap on growth and on options for industrialisation. The NDP notes that from an environmental perspective South Africa faces several related challenges. The reduction of greenhouse gas emissions and shift to a green, low-carbon economy, is one of these challenges.

In terms of implementation the NDP identifies three phases. The first two are of specific relevance to the proposed project. The first phase (2012–2017) notes that ensuring the supply of energy and water is reliable and sufficient for a growing economy. The second phase (2018–2023) involves building on the first phase to lay the foundations for more intensive improvements in productivity. The provision of affordable and reliable energy is a key requirement for this to take place.

Chapter 4, Economic infrastructure, notes that economic infrastructure provides the foundation for social and economic development. In this regard South Africa must invest in a strong network of economic infrastructure designed to support the country's medium- and long-term economic and social objectives. The plan envisages that, by 2030, South Africa will have an energy sector that promotes:

- Economic growth and development through adequate investment in energy infrastructure. The sector should provide reliable and efficient energy service at competitive rates, while supporting economic growth through job creation.
- Environmental sustainability through efforts to reduce pollution and mitigate the effects of climate change. More specifically, South Africa should have adequate supply security in electricity and in liquid fuels, such that economic activity, transport, and welfare are not disrupted.

The plan sets out steps that aim to ensure that, in 20 years, South Africa's energy system looks very different to the current situation. In this regard coal will contribute proportionately less to primary-energy needs, while gas and renewable energy resources, will play a much larger role.

### **2.3 NEW GROWTH PATH FRAMEWORK**

Government released the New Economic Growth Path Framework on 23 November 2010. The aim of the framework is to enhance growth, employment creation and equity. The policy's principal target is to create five million jobs over the next 10 years and reflects government's commitment to prioritising employment creation in all economic policies. The framework identifies strategies that will enable South Africa to grow in a more equitable and inclusive manner while attaining South Africa's developmental agenda. Central to the New Growth Path is a massive investment in infrastructure as a critical driver of jobs across the economy. In this regard the framework identifies investments in five key areas namely: **energy**, transport, communication, water, and housing.

### **2.4 NATIONAL INFRASTRUCTURE PLAN**

The South African Government adopted a National Infrastructure Plan in 2012. The aim of the plan is to transform the economic landscape while simultaneously creating significant numbers of new jobs and strengthen the delivery of basic services. The plan also supports

the integration of African economies. In terms of the plan, Government will invest R827 billion over the next three years to build new and upgrade existing infrastructure. The aim of the investments is to improve access by South Africans to healthcare facilities, schools, water, sanitation, housing and electrification. The plan also notes that investment in the construction of ports, roads, railway systems, **electricity plants**, hospitals, schools and dams will contribute to improved economic growth.

As part of the National Infrastructure Plan, Cabinet established the Presidential Infrastructure Coordinating Committee (PICC). The Committee identified and developed 18 Strategic Integrated Projects (SIPs). The SIPs cover social and economic infrastructure across all nine provinces (with an emphasis on lagging regions) and consist of:

- Five geographically focussed SIPs.
- Three spatial SIPs.
- Three energy SIPs.
- Three social infrastructure SIPs.
- Two knowledge SIPs.
- One regional integration SIP.
- One water and sanitation SIP.

The three energy SIPS are SIP 8, 9 and 10.

**SIP 8: Green energy in support of the South African economy**

- Support sustainable green energy initiatives on a national scale through a diverse range of clean energy options as envisaged in the IRP 2010).

**SIP 9: Electricity generation to support socio-economic development**

- Accelerate the construction of new electricity generation capacity in accordance with the IRP 2010 to meet the needs of the economy and address historical imbalances.

**SIP 10: Electricity transmission and distribution for all**

- Expand the transmission and distribution network to address historical imbalances, provide access to electricity for all and support economic development.

## **2.5 INTEGRATED ENERGY PLAN**

The development of a National Integrated Energy Plan (IEP) was envisaged in the White Paper on the Energy Policy of the Republic of South Africa of 1998 and, in terms of the National Energy Act, 2008 (Act No. 34 of 2008), the Minister of Energy is mandated to develop and, on an annual basis, review and publish the IEP in the Government Gazette. The purpose of the IEP is to provide a roadmap of the future energy landscape for South Africa which guides future energy infrastructure investments and policy development.

The IEP notes that South Africa needs to grow its energy supply to support economic expansion and in so doing, alleviate supply bottlenecks and supply-demand deficits. In addition, it is essential that all citizens are provided with clean and modern forms of energy at an affordable price. As part of the Integrated Energy Planning process, eight key objectives are identified, namely:

- Objective 1: Ensure security of supply.
- Objective 2: Minimise the cost of energy.
- Objective 3: Promote the creation of jobs and localisation.

- Objective 4: Minimise negative environmental impacts from the energy sector.
- Objective 5: Promote the conservation of water.
- Objective 6: Diversify supply sources and primary sources of energy.
- Objective 7: Promote energy efficiency in the economy.
- Objective 8: Increase access to modern energy.

The IEP provides an assessment of current energy consumption trends within different sectors of the economy (i.e., agriculture, commerce, industry, residential and transport) and uses this information to identify future energy requirements, based on different scenarios. The scenarios are informed by different assumptions on economic development and the structure of the economy and also take into account the impact of key policies such as environmental policies, energy efficiency policies, transport policies and industrial policies, amongst others.

Based on this information the IEP then determines the optimal mix of energy sources and technologies to meet those energy needs in the most cost-effective manner for each of the scenarios. The associated environmental impacts, socio-economic benefits and macroeconomic impacts are also analysed. The IEP is therefore focused on determining the long-term energy pathway for South Africa, taking into account a multitude of factors which are embedded in the eight objectives.

As part of the analysis four key scenarios were developed, namely the Base Case, Environmental Awareness, Resource Constrained and Green Shoots scenarios:

- The Base Case Scenario assumes that existing policies are implemented and will continue to shape the energy sector landscape going forward. It assumes moderate economic growth in the medium to long term.
- The Environmental Awareness Scenario is characterised by more stringent emission limits and a more environmentally aware society, where a higher cost is placed on externalities caused by the supply of energy.
- The Resource Constrained Scenario in which global energy commodity prices (i.e. coal, crude oil and natural gas) are high due to limited supply.
- The Green Shoots Scenario describes an economy in which the targets for high economic growth and structural changes to the economy, as set out in the National Development Plan (NDP), are met.

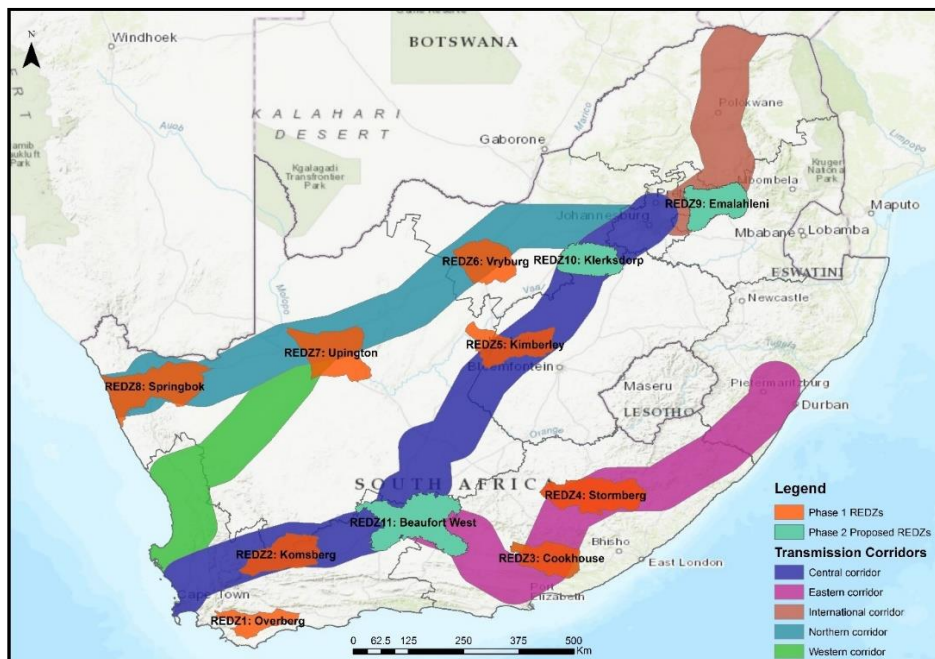
The IEP notes that South Africa should continue to pursue a diversified energy mix which reduces reliance on a single or a few primary energy sources. In terms of existing electricity generation capacity, the IEP indicates that existing capacity starts to decline notably from 2025, with significant plant retirement occurring in 2031, 2041 and 2048. By 2050 only 20% of the current electricity generation capacity remains. As a result, large investments are required in the electricity sector in order to maintain an adequate supply in support of economic growth.

By 2020, various import options become available, and some new coal capacity is added along with new wind, solar and gas capacity. The mix of generation capacity technologies by 2050 is considerably more diverse than the current energy mix, across all scenarios. The main differentiating factors between the scenarios are the level of demand, constraints on emission limits and the carbon dioxide externality costs. In all scenarios the energy mix for electricity generation becomes more diverse over the period to 2050, with coal reducing its share from about 85% in 2015 to 15–20% in 2050 (depending on the scenario). Solar, wind, nuclear, gas and electricity imports increase their share. The Environmental Awareness and Green Shoots scenarios take on higher levels of renewable energy.

An assessment of each scenario against the eight objectives with reference to renewable energy notes while all scenarios seek to ensure that costs are minimised within the constraints and parameters of each scenario, the Base Case Scenario presents the least cost followed by the Environmental Awareness, Resource Constrained and Green Shoots scenarios respectively when total energy system costs are considered. In terms of promoting job creation and localisation potential the Base Case Scenario presents the greatest job creation potential, followed by the Resource Constrained, Environmental Awareness and Green Shoots scenarios respectively. In all scenarios, approximately 85% of total jobs are localisable. For electricity generation, most jobs result from solar technologies followed by nuclear and wind, with natural gas and coal making a smaller contribution. The Environmental Awareness Scenario, due to its stringent emission constraints, shows the lowest level of total emissions over the planning horizon. This is followed by the Green Shoots, Resource Constrained and Base Case scenarios. These trends are similar when emissions are considered cumulatively and individually by type.

## 2.7 STRATEGIC ENVIRONMENTAL ASSESSMENT (SEA) FOR WIND AND SOLAR PV ENERGY IN SOUTH AFRICA

The Strategic Environmental Assessment (SEA) for wind and solar PV energy in South Africa (CSIR, 2015) identified eight (8) **Renewable Energy Development Zones (REDZs)** and five (5) **Transmission Corridors**. The REDZs identified areas where large scale wind energy facilities can be developed in a manner that limits significant negative impacts on the environment while yielding the highest possible socio-economic benefits to the country. The proposed power line is located within the Komsberg REDZ and Central Transmission Corridor (Figure 2.1).



**Figure 2.1: Location of Renewable Development Zones and Transmission Corridors in South Africa (Source CSIR)**

## 2.8 WESTERN CAPE PROVINCIAL SPATIAL DEVELOPMENT FRAMEWORK

The 2014 PSDF is based on a set of 5 guiding principles, namely:

- Spatial justice.
- Sustainability and resilience.
- Spatial efficiency.
- Accessibility.
- Quality and Livability.

Key spatial challenges are outlined in Chapter 2 of the PSDF. Energy security and climate change response are identified as key high-level future risk factors. With regard to energy use, the PSDF notes that the Cape Metro (albeit the province's most efficient user) and West Coast regions are the WCP's main energy users. It further notes that the WCP's electricity is primarily drawn from the national grid, which is dominated by coal-based power stations, and that the WCP currently has a small emergent renewable energy sector in the form of wind and solar generation facilities located in its more rural, sparsely populated areas. With regard to renewable energy, the following policy provisions are of relevance:

- Policy R.4.6: *Pursue energy diversification and energy efficiency in order for the Western Cape to transition to a low carbon, sustainable energy future, and delink economic growth from energy use.*
- R.4.7: *Support emergent Independent Power Producers (IPPs) and sustainable energy producers (wind, solar, biomass and waste conversion initiatives) in suitable rural locations (as per recommendations of the Strategic Environmental Assessments for wind energy (DEA&DP) and renewable energy (DEA)<sup>5</sup>.*

### **Climate change**

Water scarcity is identified as probably the key risk associated with climate change. Policy provisions are made with regard to climate change adaptation and mitigation. Concerning renewable energy, the following is of relevance:

- R.4.16: *Encourage and support renewable energy generation at scale.*

## 2.9 WESTERN CAPE INFRASTRUCTURE FRAMEWORK

The Western Cape Infrastructure Framework (WCIF) (2013) was developed by the WCP Provincial Department of Transport and Public Works in terms of the Provincial Government's mandate to coordinate provincial planning under Schedule 5A of the Constitution. The objective of the WCIF is to align the planning, delivery and management of infrastructure to the strategic agenda and vision for the province, as outlined in the 2009-2014 Draft Provincial Strategic Plan. The One Cape 2040 and 2013 Green is Smart strategy were other key informants.

The document notes that given the status quo of infrastructure in the province, and the changing and uncertain world facing the Western Cape over the 2-3 decades a new approach to infrastructure is needed. Namely one that satisfies current needs and backlogs, maintains the existing infrastructure, and plans proactively for a desired future outcome. The 2040 vision requires a number of transitions to shift fundamentally the way in which infrastructure is provided and the type of infrastructure provided in WCP.

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<sup>5</sup> See notes under Regional Methodology Review below.

The WCIF addresses new infrastructure development under five major 'systems' (themes), and outlines priorities for each. Energy is one of the 'systems' identified. The document notes that a provincial demand increase of 3% per year is anticipated for the period 2012-2040. Key priorities are in matching energy generation/ sourcing with the demand needed for WCP economic growth. Additionally, the energy focus should be on lowering the provincial carbon footprint, with an emphasis on renewable and locally generated energy.

Three key transitions are identified for the WCP Energy 'system' infrastructure, namely:

- Shifting transport patterns to reduce reliance on liquid fuels.
- Promoting natural gas as a transition fuel by introducing gas processing and transport infrastructure.
- Promoting the development of renewable energy plants in the province and associated manufacturing capacity.

## **2.10 NORTHERN CAPE PROVINCIAL GROWTH AND DEVELOPMENT PLAN (NCPGDP)**

The Northern Cape Provincial Growth and Development Plan (NCPGDP) is aligned with NDP-2030 and seeks to eradicate poverty, inequality and halve unemployment by 2030. The NCPGDP identifies four key drivers to achieve the vision and reduce poverty and unemployment. Economic transformation and growth, social transformation and human welfare and environmental sustainability and resilience are relevant to identifying and assessing needs.

- Economic transformation and growth, which is aimed at creating employment opportunities and thereby reducing poverty. Skills development and training is identified as a key need.
- Social transformation and human welfare, which is aimed at improving education levels, access to affordable and quality health care, improved safety, and security, and creating sustainable human settlements.
- Environmental sustainability and resilience, which is aimed at protecting the regions natural resources and addressing the threats posed by climate change.

## **2.11 KAROO HOOGLAND INTEGRATED DEVELOPMENT PLAN**

The KH IDP (2017-2022) identifies four Key Performance Areas (KPA's). Table 2.1 lists the KPA's and the strategic objectives and outcomes and programmes. KPA 1, Basic Service Delivery and KPA 2, Local Economic Development, are the most relevant to the proposed project.



**Table 2.1: Karoo Hoogland IDP KPAs**

<b>KPA</b>	<b>STRATEGIC OBJECTIVES</b>	<b>OUTCOME</b>	<b>PROGRAMME</b>
<b>KPA 1:</b> Basic Service Delivery	Provide quality of living human settlements with adequate infrastructure	<ul style="list-style-type: none"> <li>Improved quality of municipal basic service delivery in formalised areas: potable water, waste water, electricity, and solid waste</li> <li>Improved mobility through the provision of quality municipal roads and storm water drainage</li> </ul>	<ul style="list-style-type: none"> <li>Electrification</li> <li>Water and Sanitation.</li> <li>Roads and Storm water.</li> <li>Waste Management.</li> <li>Health Services.</li> <li>Education and Libraries.</li> <li>Safety and Security.</li> <li>Climate Change.</li> <li>Public Transport.</li> <li>Environmental Management</li> </ul>
<b>KPA 2:</b> Local Economic Development	<ul style="list-style-type: none"> <li>Transform Urban areas to vibrant economic centres that are safe and secure.</li> <li>Promote growth and diversification of the local economy.</li> <li>Promote BBBEE development.</li> <li>Promote healthy living and working environments.</li> <li>Promote social cohesion through economic and social development</li> </ul>	<ul style="list-style-type: none"> <li>Renewed urban economic centres.</li> <li>Growing and diversifying local economy.</li> <li>Sustainable BBBEE enterprises and SMME's in the local economy.</li> <li>Improved levels of employment in the local economy.</li> <li>Improved quality of public health services.</li> <li>Improved social integration and cohesion</li> </ul>	<ul style="list-style-type: none"> <li>Economic growth and development.</li> <li>Poverty Alleviation.</li> <li>Tourism.</li> <li>SMME Development</li> </ul>

In terms of KPA 2, Local Economic Development (LED), the IDP highlights the importance of private public partnerships for achieving economic development in the KH. The LED policy framework identifies a number of LED Policy Pillars/Thrusts. Of relevance to the Needs Assessment these include building a diverse economic base, developing learning and skilful economies, and enterprise development and support. The IDP identifies a number of projects associated with the LED Pillar/Thrusts. Of relevance these include:

***Building a diverse economic base***

- Investigate possible opportunities for development of renewable energy.

***Developing learning and skilful local economies***

- Identify skill gaps and implements skills development and training programmes

***Developing inclusive economies***

- Support the informal and rural economy.
- Support development of women and the youth.
- Establish community gardens.

The IDP also highlights the need to support for the rural economy, with specific reference to the One House Hold One Hectare (1HH1HA) Programme. The Objectives of the 1HH1HA

Programme include reducing poverty in rural areas, creating opportunities for Black Commercial Smallholding Farmers, improving security of tenure for historically disadvantaged (HD) rural communities and develop farming skills. The benefits for the 1HH1HA Programme include job creating, poverty alleviation, food security, skills development, security of tenure and restoration of dignity to marginalised HD rural communities.

KPA 2, Local Economic Development (LED) identifies the need to address the challenges facing vulnerable groups in the KH, including the youth and physically and mentally challenged members of the community.

The high unemployment levels and the lack of meaningful employment opportunities represents a key challenge faced by the youth in the KH. There are also inadequate educational facilities/institutions such as Technikons, FET colleges and Universities in the KH and ND.

The IDP also refers to the need to interact with National and Provincial and District agencies aimed at youth development. The provision of quality education at Early Child Development (ECD) is also a key need. The challenges facing ECDs include lack of proper facilities and support material at learning centres, lack of funding, and food security.

The IDP also highlights the threat posed by climate change, noting it threatens food security, poverty alleviation and sustainable socio-economic growth. Vulnerable households are at most risk. A combination of increasing temperatures and reduced and/or more variable rainfall could have severe negative impacts for the Namakwa District, including the KHM. In this regard the KHM is characterised by high levels of poverty and inequality, isolated communities, and a large geographical area, which results in a vulnerable population. Large numbers of people, both private and communal, are also directly dependent on agriculture, and therefore on functioning ecosystems and water regimes, for their livelihoods. These communities and households are therefore directly affected by the risks posed by climate change.

The IDP notes that the KHM is likely to be one of the most affected municipalities in terms of the impact of climate change on water quality and availability. Addressing these threats and the needs associated with the threat posed by climate change is therefore a key challenge.

## **2.12 KAROO HOOGLAND SPATIAL DEVELOPMENT FRAMEWORK**

The KH Spatial Development Framework (SDF) (2019) identifies list four strategies, namely:

### ***Strategy 1: Enhance local connectivity***

The objectives of Strategy 1 include improving the connection between the towns of Sutherland, Williston and Fraserberg and the surrounding rural areas, and support for the diversification of economies, tourism, the knowledge economy, the green economy and alternative energy-related enterprise development.

### ***Strategy 2: Protecting local resources***

The objectives of Strategy 2 include integrated management and prioritisation of Karoo Hoogland's natural and man-made cultural landscape resources and protection of high value agricultural land. The actions identified include alien vegetation clearing and riverine and wetland management and environmental awareness and education programmes.

### ***Strategy 3: Urban and rural development***

The objectives of Strategy 3 include more sustainable land reform process and in areas closer to urban centres, creating opportunities for increased food security and economic development for rural dwellers, creation of sustainable and accessible employment opportunities, and improved opportunities in the Tourism Sector.

The actions identified include establishing opportunities for urban agriculture (home, school and community gardens) to promote household food security and improved nutrition, create opportunities for local food producers to market their products (farmers markets, etc.), and establishment of artisan workshops to provide local population with the chance to develop skills to participate within the economic sectors.

Tourism and the renewable energy sector are identified as key drivers in terms of development in the KH.

### ***Strategy 4: Enhance infrastructure development***

The objectives of Strategy 3 include, maintain basic services and addressing backlogs, improving public facilities and access to these facilities, improving public transport and access to public transport and recycling programmes.

## **2.13 LAINGSBURG INTEGRATED DEVELOPMENT PLAN**

The LM IDP (2017-2022) identifies six priority area of which the following are relevant to the project:

- Environmental and Spatial Development.
- Local Economic Development.
- Basic Service Delivery.
- Social and Community Development.

### **Priority 1: Environmental and Spatial Development**

The focus of Priority 1 is on creating a safe municipal area, the conservation of the town's heritage and, or relevance to the renewable energy sector, creating a clean green oasis in the Karoo. It also seeks to restore dignity in rural areas. A number of strategic objectives are associated with each of the priority areas listed in the IDP.

### **Priority 2: Local Economic Development**

The focus of Priority 2 is on creating opportunities to ensure growth and development of the Laingsburg municipal economy. Of relevance to the renewable energy sector the IDP notes the commitment of the municipality create an enabling environment and incentives to attract investment to the area. A number of strategic objectives are associated with each of the priority areas listed in the IDP.

### ***Strategic Objective 2: Promote local economic development***

The focus areas for supporting economic development and creating employment are the tourism sector and support for Small Medium Micro Enterprise Developments (SMME's).

### **Priority 3: Basic Service Delivery**

The focus of Priority 3 is to maintain and improve current levels of service delivery in the LM. The IDP also notes that well maintained infrastructure also supports and promotes local economic development.

#### **Priority 4: Social and Community Development**

The focus of Priority 4 is on promoting equal accessibility for available opportunities for all, especially the poor and the youth. Priority 4 also seeks to create opportunities for moral regeneration by implementing awareness programmes, skills development and training and the provision of free basic services.

#### ***Strategic Objective 4: Improve the standards of living of all people in Laingsburg***

The IDP lists a number of projects associated with Strategic Objective 3, including implementation of a crime prevention and rehabilitation programme, establishment of ECD Centres, ensuring the effective operation of the towns Thusong Service Centre, and supporting old age facilities in the town. Improved living standards are also linked to a skilled and educated population. The IDP therefore highlights the need to improve overall literacy levels and create opportunities to support education and skills development and training.

A SWOT Analysis undertaken as part of the IDP process lists the strengths, weaknesses, opportunities, and threats facing the LM. The following are relevant to the Needs Assessment.

#### ***Strengths***

- Stable municipality.
- Well-located in terms of access by road and rail.
- Good infrastructure in place.
- Nice clean town.
- Strong, professional administration with professional.
- Good public participatory and ward committee system.
- Established tourism office.
- Thusong Service Centre.

#### ***Weakness***

- Narrow income base.
- Small business sector.

#### ***Opportunities***

- Establishment of economic development infrastructure.
- Development of light industrial area.
- Green Energy.
- Training and Skills Development.
- Establishment of organised Business sector

#### ***Threats***

- Aging municipal infrastructure.
- Climate change and drought.
- High level of grant dependency.
- Skills shortages and difficulty in retaining scarce skills.
- Low literacy rates and high drop-out rates for school children.
- Large distances to large towns.
- Poor condition of gravel roads in rural areas.
- High water losses from municipal infrastructure.

The IDP highlights the threat posed by the impact of climate change, specifically given the key role played by the agriculture to the local economy. The key risks are linked to the long-term rise in temperature, variability in precipitation and changes in precipitation patterns and growing season etc. The IDP notes that water availability is the most important limiting factor

affecting the agriculture sector (crop and animal production) in the LM. Climate change therefore has the potential to impact on employment and food security.

## **2.14 LAINGSBURG LOCAL ECONOMIC DEVELOPMENT AND TOURISM STRATEGY**

The Laingsburg Local Economic Development (LED) and Tourism Strategy (2019-2029) is informed by and aligned with relevant national, provincial, district and local policies and plans, including the National Development Plan and Western Cape Strategic Plan (2019-2024).

The aim of the LED and Tourism Strategy is to guide the long-term sustainable planning and development of the Laingsburg economy. This includes reducing poverty within the Laingsburg Municipal area. The LED strategy is based on the overall vision outlined in the IDP. The Strategy assesses the current socio-economic environment, outlines strategic goals for the next ten-years, it recommends a series of actions to achieve those goals by leveraging existing assets and strengths, overcoming existing weaknesses and threats, and developing new assets and strengths. The LED Strategy therefore identifies key socio-economic needs facing the LM and strategies to address these needs.

The LED aims to create job opportunities by assisting the local economy to grow by developing more small business in the municipal area, specifically for HD members of the community. One of the key drivers for LED is tourism. Tourism has the ability and potential to create long-term work opportunities.

The LED and Tourism Strategy identifies a number of key socio-economic trends, challenges and key considerations that have a bearing on the project. These include:

- Climate change poses a number of challenges to the agricultural sector in Western Cape, including the LM area.
- Laingsburg as a drought prone area is faced with the increased competition for water resources from agricultural and other uses, including urban and industrial.
- The Municipality will need to develop and implement strategies to address climate change and the impact of drought. The predicted increase in the frequency and severity of droughts will have a negative impact on agriculture.
- Agriculture is the backbone of Laingsburg economy. However, the agriculture sector is not diverse, the dominant activity is sheep (wool and meat) farming.
- There is a lack of formal employment, including self-employment opportunities, in the LM.
- The LM has high unemployment rates, low-income levels, and high illiteracy rates. The high illiteracy rates are linked to the high percentage of school drop outs. This has resulted in high poverty rates and increasing levels of substance abuse in Laingsburg.
- There is a shortage of skilled labour.
- There is a high degree of grant dependency.

The LED also identifies the development of a renewable energy centre as strategic initiative.

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## **SECTION 3: OVERVIEW OF THE STUDY AREA**

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### **3.1 INTRODUCTION**

Section 3 provides an overview of the:

- Site Sensitivity Verification.
- The administrative context.
- The demographic context.
- The site and surrounding land uses.

### **3.2 SITE SENSITIVITY VERIFICATION**

Where a specialist assessment is required and no specific environmental theme protocol has been prescribed (as per Government Gazette 43110, 20 March 2020), the required level of assessment must be based on the findings of the site sensitivity verification and must comply with Appendix 6 of the EIA Regulations.

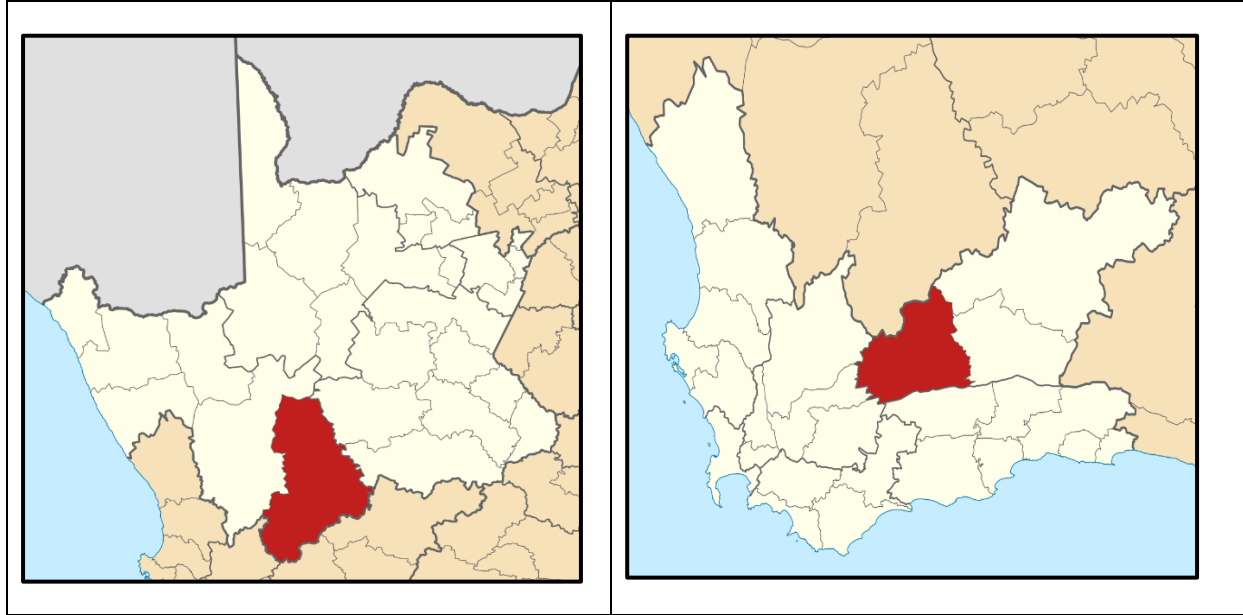
In accordance with GN 320 and GN 1150 of the NEMA EIA Regulations of 2014, prior to commencing with a specialist assessment, a site sensitivity verification must be undertaken to confirm the current land use and environmental sensitivity of the proposed project area as identified by the National Web-Based Environmental Screening Tool (Screening Tool).

No preliminary socio-economic sensitivities or sensitivity rating was identified or provided based on the DFFE Screening Tool (i.e. a preliminary sensitivity rating was not provided that could then be confirmed or altered based on further assessment).

Nevertheless, this assessment report contains a detailed assessment of the socio-economic impacts of the proposed project. As such, it provides all the necessary information and assessment data to provide an opinion on the sensitivity rating of the site. In particular, Section 4 and Section 5 of the report speaks to social sensitivities identified of the site as confirmed by a site visit undertaken in 2021.

### **3.3 ADMINISTRATIVE CONTEXT**

The majority of the proposed Karreebosch grid connection is located in the Karoo Hoogland (KH) with a small section in the Laingsburg Municipality (LM), which are located in the Northern and Western Cape Province respectively (Figure 3.1).

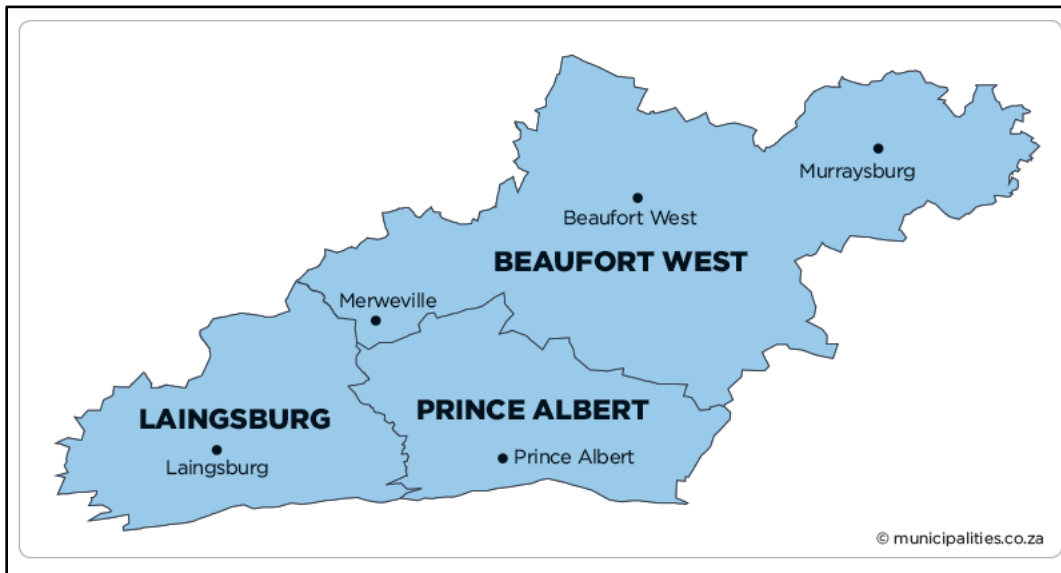


**Figure 3.1: Location of Karoo Hoogland and Laingsburg and Municipality within Northern and Western Cape Province**

The KH is one of six local municipalities that make up the Namakwa District (ND) Municipality (Figure 3.2). The LM is one of three local municipalities that make up the Central Karoo District (CKD) Municipality (Figure 3.3). Springbok and Williston are the administrative seats of the ND and KH respectively. Beaufort West and Laingsburg are the administrative seats of the CKD and LM respectively.



**Figure 3.2: Local municipalities within Namakwa District**



**Figure 3.3: Local municipalities within Central Karoo District**



The town of Sutherland in the KH is located ~ 48 km north of the site. The small settlement of Matjiesfontein and the town of Laingsburg are located ~ 34 km and 38 km to the south and south east of the site, respectively.

### ***Sutherland***

The three main towns in Karoo Hoogland are Williston, Fraserburg and Sutherland. The town of Sutherland was founded in 1855 as a church and market town to serve the sheep farming community in the area. The town is located approximately 100 km north of the small village of Matjiesfontein and is accessed via the R 354. The main economic activities include tourism and sheep farming. South African Astronomical Observatory (SAAO) was established outside the town in 1972 and plays a key role in the town's tourism related economy.

### ***Matjiesfontein***

Matjiesfontein was founded in 1884, three years after Laingsburg, by James Douglas Logan during the early stages of the 1<sup>st</sup> Anglo-Boer war. The Lord Milner Hotel was initially a military hospital. By 1899 the hotel and associated facilities was converted to convalescent centre for patients with respiratory ailments. The hotel and adjacent buildings that make up the village was restored in 1970 and declared a national monument. The village consists of two sections, the historic, Victorian section located to the north of the railway line, and a residential, low-income area, including a clinic and school, located to the south of the railway line. The spatial layout of the village reflects apartheid planning.

### ***Laingsburg***

The LM has one main settlement, Laingsburg, and one secondary settlement, Matjiesfontein. They are connected via the N1 Freeway and the main Cape Town to Gauteng railway line. Laingsburg serves as the main service centre, providing medical, educational, as well as limited commercial activities as well as administrative services. Other smaller rural farm settlements include Vleiland in the south-east and Rouxpos. Vleiland has a church and a shop. They are essentially farming communities located to the south of Laingsburg along the R323. Laingsburg is strategically situated on the N1 and rail transport corridor between Gauteng and Cape Town. Laingsburg town is the administrative seat of local government and serves as an agricultural service centre. Matjiesfontein's economic base is essentially a single tourist resort comprising a Victorian village across the railway line. The population largely comprises hotel staff and a few government employees.

Laingsburg is the largest node in the municipal area. The town was established as a trading post in 1881 and became a municipality in 1904. The national road through the town was completed in 1942. The town serves as the administrative seat of the Laingsburg Municipality and houses the key municipal facilities and commercial services, including the municipal offices, schools, hospitals, clinics, police station, tourism centre, museum, old age home, petrol stations and facilities for motorist and long-haul trucks.

## **3.4 DEMOGRAPHIC OVERVIEW KAROO HOOGLAND MUNICIPALITY**

### **3.4.1 Demographics**

#### ***Population***

Based on the 2016 Community Household Survey the population of the KH was 13 010. In terms of race groups, Coloureds made up 79.3%, followed by Whites (19.7%) and Black Africans (0.7%). The main first language spoken in the KH was Afrikaans (98.5%), followed by IsiXhosa (0.4%) and English (0.3%) (Community Household Survey 2016).

In terms of age, the 2016 Household Community Survey found that 31% of the population were under the age of 18, 58% were between 18 and 64, and the remaining 11% were 65 and older (Table 3.1). The KHM therefore has a relatively large young population. This creates challenges in terms of creating employment opportunities.

**Table 3.1: Population by age category**

Column	Karoo Hoogland		Namakwa		Northern Cape	
<b>Under 18</b>	31%	4,034	29.3%	33,776	35.7%	426,616
<b>18 to 64</b>	58%	7,546	61.2%	70,705	57.7%	688,405
<b>65 and over</b>	11%	1,429	9.5%	11,006	6.6%	78,759

Source: Wazimap: 2016 Household Community Survey

The high percentage of young people also means that a large percentage of the population is dependent on a smaller productive sector. The dependency ratio is the ratio of non-economically active dependents (usually people younger than 15 or older than 64) to the working age population group (15-64). The higher the dependency ratio the larger the percentage of the population dependent on the economically active age group. This in turn translates reduced revenue for local authorities to meet the growing demand for services. The national dependency ratio in 2011 was 52.7%, lower than the figure for the Northern Cape (55.7%). The dependency ratio for the KH in 2011 was 50.9%. The traditional approach is based people younger than 15 or older than 64. The 2016 information provided provides information for the age group under 18. The total number of people falling within this age group will therefore be higher than the 0-15 age group. However, most people between the age of 15 and 17 are not economically active (i.e. they are still likely to be at school or dependent upon their parents or other family members).

Using information on people under the age of 18 is therefore likely to represent a more accurate reflection of the dependency ratio. Based on these figures, the dependency ratio for the KHM (2016) was 72%. This figure is significantly higher than the national, provincial, and municipal levels in 2011. The higher dependency ratio reflects the limited employment opportunities in the area and represent a significant risk to the district and local municipality.

### ***Households, house types and ownership***

Based on the information from the 2016 Household Community Survey there were 4621 households in the KH. The overwhelming majority of households resided in formal houses (97.6%). This is higher than the figure for the District (88.4%) and significantly higher than the figure for the Northern Cape (74.4%). Only 0.4% of the households in the KH resided in shacks, compared to 2.3% and 12.8% for the District and Province, respectively (Table 3.2). In terms of ownership, 63.6% of houses are owned and fully paid off, 4.4% are owned but in the process of being paid off and 8.5% are rented. The high percentage of formal houses coupled with high level of homeownership reflects a stable, middle class community. However, as indicated below, household income levels are low.

**Table 3.2: Households by type of dwelling**

Column	Karoo Hoogland		Namakwa		Northern Cape	
House	97.6%	4,506	88.4%	33,308	74.4%	263,123
Semi-detached house	1.3%	58	2.8%	1,042	1.6%	5,602
Townhouse	0.6%	29	0.1%	40	0.4%	1,375
Shack	0.4%	19	2.3%	870	12.8%	45,246
Other	0.1%	6	6.4%	2,411	10.9%	38,364

Source: Wazimap: 2016 Household Community Survey

Based on the information from the 2016 Community Household Survey 32.4% of the households in the KH are headed by females. Although the figures are lower than the NDM (37.5%) and Northern Cape (38.8%), the relatively high number of female-headed households at the local municipal level reflects the lack on formal employment and economic opportunities in the KHM. As a result, job seekers from the LM need to seek work in the larger centres, specifically Cape Town and Winelands area. The majority of the job seekers are likely to be males. This is due to traditional rural patriarchal societies where the role of the women is usually linked to maintaining the house and raising the children, while the men tend to be the ones that migrate to other areas in search of employment.

### **Household income**

Based on the data from the 2011 Census, 6.6% of the population of the KH had no formal income, 2.4% earned less than R 4 800, 5% earned between R 5 000 and R 10 000 per annum, 24.6% between R 10 000 and R 20 000 per annum and 26.2% between R 20 000 and R 40 000 per annum (2016).

The poverty gap indicator produced by the World Bank Development Research Group measures poverty using information from household per capita income/consumption. This indicator illustrates the average shortfall of the total population from the poverty line. This measurement is used to reflect the intensity of poverty, which is based on living on less than R3 200 per month for an average sized household (~ 40 000 per annum). Based on this measure, in the region of 64.8% of the households in the KH live close to or below the poverty line. The figures for the ND and Northern Cape were 58.1% and 62.5% respectively. The low-income levels in the KH reflect the limited employment opportunities and dependence on the agricultural sector. This is also reflected in the high unemployment rates. The low-income levels are a major concern given that an increasing number of individuals and households are likely to be dependent on social grants. The low-income levels also result in reduced spending in the local economy and less tax and rates revenue for the KH. This in turn impacts on the ability of the KH to maintain and provide services.

The low household income levels are reflected in the number of indigent households in the KH, which had 944 registered indigent households in 2016. This represents 20% of the total number of households in the KH.

## Employment

Based on the 2011 Census the official unemployment figure for the KH was 8%. The figures also indicate that the majority of the population are not economically active, namely 40.4%. The unemployment figure is lower than the official unemployment rate for the ND (11.1%) and Northern Cape (14.5%). While the level of unemployment is low, this needs to be considered within the context of the low-income levels and the dependence on the agricultural sector.

## Education

Education levels in the KH are reflected by the percentage of the population under the age of 20 that have no education, the percentage that have some primary and or have completed primary school, and the percentage that have passed grade 12 (matric). Based on the 2016 Household Community Survey, 13.2% of the population over the age of 20 had not formal education. This is significantly higher than the figures for ND (4.4%) and Northern Cape (7.9%) and reflects the rural nature of large parts of the KH. The percentage with some primary and primary school was 14%, compared to 12.6% and 13.4% for the ND and Northern Cape Province, respectively. The percentage with matric was 29.2%, which was higher than the ND (27.1%) and Northern Cape (29.1%) (Table 3.3). The higher matric rates are interesting, specifically given the figure for no formal education. However, despite the higher matric pass rates, the Namakwa IDP notes that the KH has the lowest functional literacy rate in the ND. defines functional literacy as the number of people in a region that are 20 years and older and have completed at least their primary education (i.e. grade 7). Functional literacy describes the reading and writing skills that are adequate for an individual to cope with the demands of everyday life - including the demands posed in the workplace. This is contrasted with illiteracy in the strictest sense, meaning the inability to read or write. Functional literacy enables individuals to enter the labour market and contribute towards economic growth thereby reducing poverty.

**Table 3.3: Population by highest educational level**

Column	Karoo Hoogland		Namakwa		Northern Cape	
None	13.2%	1,157	4.4%	3,537	7.9%	58,818
Other	0%	0	0.5%	368	0.5%	3,786
Some primary	14%	1,228	12.6%	10,083	13.4%	100,079
Primary	8.3%	732	8.1%	6,481	5.8%	43,349
Some secondary	25.4%	2,238	39.9%	31,934	36.2%	269,520
Grade 12 (Matric)	29.2%	2,572	27.1%	21,696	29.1%	216,562
Undergrad	5.6%	492	2.8%	2,255	2.6%	19,707
Post-grad	2.4%	215	1.7%	1,391	1.9%	14,354
N/A	1.9%	166	3%	2,381	2.6%	19,029

Source: Wazimap: 2016 Household Community Survey

### 3.4.2 Municipal services

#### **Electricity**

Based on the information from the 2016 Community Survey 96.6% of households in the LM had access to electricity. Of this total 66.7% had in-house prepaid meters, while 6.6% have conventional in-house meters, and 20.3% had solar power. Only 3.4% of households did not have access to electricity, this is marginally higher than the figures for the ND (2.2%), but higher than the figure for the Northern Cape (6.7%). Based on the 2016 Community Survey most of the households in the LM (74.3%) are supplied with electricity by the KH (Table 3.4). The high percentage of households that use solar energy reflects the rural nature of the area.

**Table 3.4: Population by electricity access**

Column	Karoo Hoogland		Namakwa		Northern Cape	
In-house prepaid meter	67.7%	8,809	84%	96,978	79.9%	953,855
Solar home system	20.3%	2,645	4.2%	4,873	1%	12,244
In-house conventional meter	6.6%	856	7.7%	8,865	10.5%	125,627
No access to electricity	3.4%	444	2.2%	2,571	6.7%	79,622
Other	2%	256	1.9%	2,200	1.9%	22,432

Source: Wazimap: 2016 Household Community Survey

#### **Access to water**

Based on the information from the 2016 Community Survey 69% of households were supplied by a regional or local service provider, while 30.4% relies on their own source of water. The higher percentage of households that rely on their own source of water reflects the rural nature of the area, where large distances make it difficult and expensive to provide services to all areas, specifically farms. In terms of access to water, 74.9% of the households in the KH had had piped water inside their houses, while 21.4% relied on piped water inside the yard. The figures of piped water supplied inside of homes for the ND and Northern Cape were 72.1% and 45.3% respectively (Table 3.5). The figures for the KH are therefore higher than both the district and provincial levels. The figure for water supplied by boreholes (2.4%) is higher than both the ND (0.8%) and Northern Cape (1.3%). This reflects the rural character of large areas of the KH. Based on the 2016 Community Survey most of the households in the KH (99.4%) have access to potable water, with 69% being supplied by a regional or local service provider

**Table 3.5: Population by water source**

Column	Karoo Hoogland		Namakwa		Northern Cape	
Piped water inside house	74.9%	9,738	72.1%	83,258	45.3%	540,743
Piped water inside yard	21.4%	2,788	23.9%	27,565	34.3%	409,636
Borehole in yard	2.4%	307	0.8%	880	1.3%	15,056
Borehole outside yard	0.7%	90	1.2%	1,341	0.8%	8,981
Other	0.7%	86	2.1%	2,444	18.4%	219,364

Source: Wazimap: 2016 Household Community Survey

### **Sanitation**

Based on the information from the 2016 Community Survey, 69.7% of households have access to flush toilets, 17.4% rely on pit toilets, 9.3% use bucket toilets, and 2.7% reported no access to toilet facilities. The access to flush toilets is significantly lower than the ND (82.3%) and marginally lower than the Northern Cape (71.6%). The figures for no access are higher than the ND (1.9%) but lower than the Northern Cape (4%). Based on the 2016 Community Survey most of the households in the KH (69.7%) have access to flush toilet facilities, with only 2.7% reporting having no access to toilet facilities (Table 3.6).

**Table 3.6: Population by toilet facilities**

Column	Karoo Hoogland		Namakwa		Northern Cape	
Flush toilet	69.7%	9,065	82.3%	94,056	71.6%	849,803
Pit toilet	17.4%	2,263	12.6%	14,341	19%	225,522
Bucket toilet	9.3%	1,205	2.6%	3,016	4.4%	52,084
None	2.7%	348	1.9%	2,119	4%	48,008
Other	1%	129	0.7%	768	1%	11,566

Source: Wazimap: 2016 Household Community Survey

### **Refuse collection**

Based on the information from the 2016 Community Survey, 67.9% of households have their refuse collected by a local authority or private company on a regular basis, while 30% rely on their own waste disposal dump. The high number of households that dispose of their waste at their own dump reflects the rural nature of the KH. The majority of these households are likely to be associated with farms in the KH. Based on the 2016 Community Survey most of the households in the KH (67.9%) have their waste collected on a regular basis by a service provider (Table 3.7). This percentage is likely to represent the majority of households located in the three towns in the KH.

**Table 3.7: Population by refuse disposal**

Column	Karoo Hoogland		Namakwa		Northern Cape	
Service provider (regularly)	67.9%	8,830	86.2%	99,585	64.9%	774,691
Own dump	30%	3,907	8.3%	9,540	21.5%	256,078
Other	1%	135	0.7%	783	1.9%	22,143
Service provider (not regularly)	0.5%	60	3.6%	4,171	3%	35,551

Source: Wazimap: 2016 Household Community Survey

In summary, based on the 2016 Community Survey the service levels in the KH can be describe as relatively high. In this regard 74.3% of households are supplied with electricity, while 20.3% have access to solar power, 99.4% have access to potable water, with 69% being supplied by a regional or local service provider, 69.7% have access to flush toilet facilities, with only 2.7% reporting having no access to toilet facilities, and 67.9% have their waste collected on a regular basis by a service provider. The percentages should also be

considered within in the context of the rural nature of large parts of the KH. In this regard the service levels in the three towns in the KH are likely to be higher than for the entire KH.

### 3.4.3 Education and health care facilities

#### **Education facilities**

In terms of school facilities, each of the three towns in the KH serviced by a primary and a high school (Table 3.8). The high school in Sutherland was damaged by a fire in 2018. The Northern Cape Provincial Health Department Annual Report (2018/19) notes that the ND, which includes the KH, is one of the largest district municipalities in the Northern Cape, but at the same time is home to the lowest population. Most schools in this ND are located in remote areas and a large number of them have infrastructure assets which are under-utilised. The ND also has the largest number of school hostels in the Province, due to its geographical size.

**Table 3.8: Education facilities in the KH**

EDUCATION FACILITIES						
Town	Pre Primary School	Primary School	Secondary School	High School	Combined School	Special School
<b>Fraserburg</b>	-	1	-	1	-	-
<b>Sutherland</b>	-	1	-	1	-	-
<b>Williston</b>	-	1	-	1	-	-

There are no Further Education and Training (FET) colleges in Sutherland with the closest one is located in Worcester, which is located in the Breede Valley Municipality in the Western Cape. There is also a training college in Beaufort West, which is located in the Central Karoo District Municipality.

#### **Health care facilities**

Access to healthcare services is a basic human right and one that is directly affected by the number and spread of facilities within their geographical area. The provision of health care and the associated services is a provincial function provided by the Western Cape Department of Health. The IDP notes that the services provided in the KH are not satisfactory due to shortage of doctors, ambulances as well as inferior conditions of the road infrastructure between the towns. There are 3 clinics in the municipal area, one in each of the three towns, namely Williston, Fraserburg and Sutherland. Due to the distance rural nature of the area and the distances involved, rural communities have requested mobile clinics. There is currently no resident doctor in Sutherland. There are two doctors at the clinic in Calvina (160 km). Most residents that require a doctor travel to the hospital in Worcester.

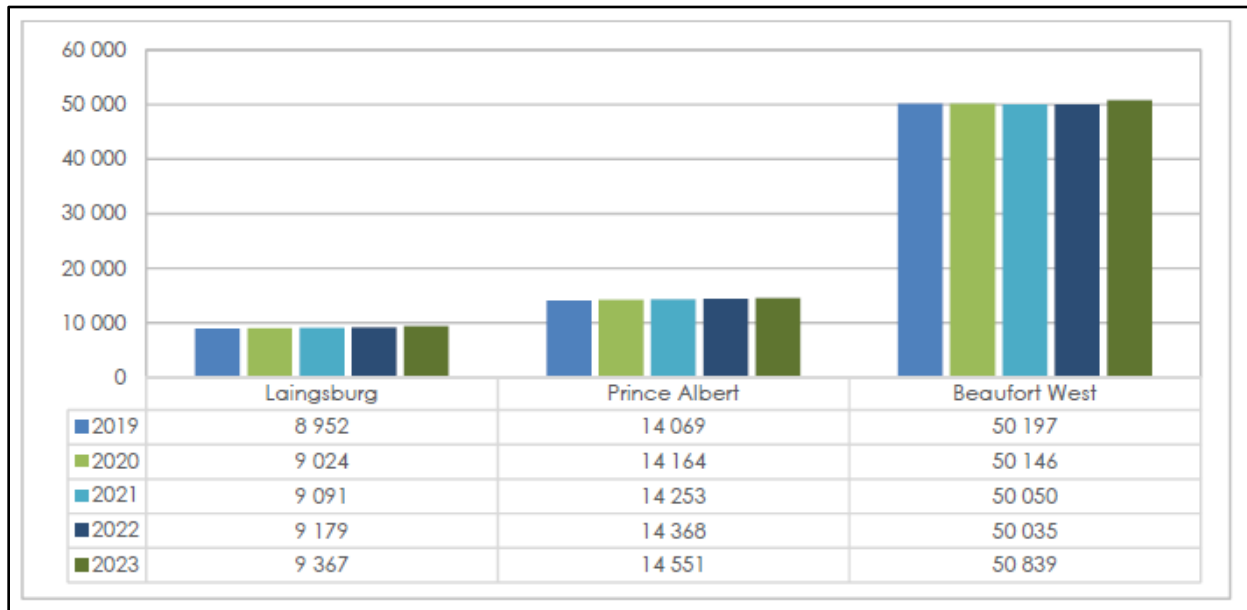
### 3.5 DEMOGRAPHIC OVERVIEW-LAINGSBURG MUNICIPALITY

#### 3.5.1 Demographics

##### **Population**

Based on the 2016 Community Household Survey, the population of the LM was 8 895. The LM IDP indicates that ~ 80% population reside in Laingsburg, while ~15% live in the rural parts of the municipal area and 5% reside in the small settlement of Matjiesfontein. In terms of race groups, Coloureds made up 88.2%, followed by Whites (10%) and Black Africans (1.7%). The main first language spoken in the LM was Afrikaans (96%), followed by English (1%) and IsiXhosa (0.8%) (Community Household Survey 2016).

The 2019 Socio-Economic Profile for the Laingsburg Municipality (LM) prepared by the Western Cape Department of Social Development, indicates that the population of the Laingsburg Municipality in 2021 is projected to be 9 024, increasing to 9 367 by 2023 (Figure 3.4). This equates to a 1.1 % annual average growth rate. The estimated population growth rate of Laingsburg is therefore slightly above the estimated population growth of the CKD of 0.5%.



Source: 2019 Socio-Economic Profile for the Laingsburg Municipality

**Figure 3.4: Population projections for Laingsburg Municipality**

In terms of age, the 2016 Household Community Survey found that 29.5% of the population were under the age of 18, 62.5% were between 18 and 64, and the remaining 8% were 65 and older. The LM therefore has a relatively large young population. This creates challenges in terms of creating employment opportunities.

The high percentage of young people also means that a large percentage of the population is dependent on a smaller productive sector. The dependency ratio is the ratio of non-economically active dependents (usually people younger than 15 or older than 64) to the working age population group (15-64). The higher the dependency ratio the larger the percentage of the population dependent on the economically active age group. This in turn translates reduced revenue for local authorities to meet the growing demand for services. The



national dependency ratio in 2011 was 52.7%, significantly higher than that of the Western Cape (45%). The dependency ratio for the LM in 2011 was 50.9%. The traditional approach is based people younger than 15 or older than 64. The 2016 information provided provides information for the age group under 18. The total number of people falling within this age group will therefore be higher than the 0-15 age group. However, most people between the age of 15 and 17 are not economically active (i.e. they are still likely to be at school or dependent upon their parents or other family members).

Using information on people under the age of 18 is therefore likely to represent a more accurate reflection of the dependency ratio. Based on these figures, the dependency ratio for the LM (2016) was 60%. This figure is higher than the national, provincial, and municipal levels in 2011. The higher dependency ratio reflects the limited employment opportunities in the area and represent a significant risk to the district and local municipality.

The 2019 Socio-Economic Profile for the Laingsburg Municipality indicates that 27% of the population in 2019 fell within the 0-14 age group, 63% fell within the economically active age group of 15 to 65, and 10% were over the age of 65 (Figure 3.5). This translates in a dependency ratio of 57.5%. In terms of projected population growth, the largest population growth is expected to be in the over 65 age group, which is projected to increase at a rate of 2.6%, compared to 1.1% for the economically active group. This will result in a marginal increase in the dependency ratio from 57.5% in 2019 to 57.7% in 2025.

Laingsburg Age Cohorts, 2019 – 2025				
Year	Children 0 – 14 Years	Working Age 16 – 65 Years	Aged 65+	Dependency Ratio
2019	2 438	5 684	830	57.5
2022	2 399	5 880	900	56.1
2025	2 538	6 071	968	57.7
Growth	0.7%	1.1%	2.6%	-

Source: 2019 Socio-Economic Profile for the Laingsburg Municipality

**Figure 3.5: Age breakdown of Laingsburg population**

### ***Households, house types and ownership***

Based on the information from the 2016 Household Community Survey there were 2861 households in the LM. The overwhelming majority of households resided in formal houses (96.5%). This is similar to the figure for the District (97.3%) and significantly higher than the figure for the Western Cape (72.2%). Only 1.6% of the households in the LM resided in shacks. In terms of ownership, 55.7% of houses are owned and fully paid off, 5.3% are owned but in the process of being paid off, 17.9% are rented, and 10.3% are occupied rent free. The high percentage of formal houses coupled with high level of homeownership reflects a stable, middle-class community. However, as indicated below, household income levels are low.

Based on the information from the 2016 Community Household Survey, 31.8% of the households in the LM are headed by females. Although the figures are lower than the CKD (40.8%) and Western Cape (38%), the relatively high number of female-headed households

at the local municipal level reflects the lack on formal employment and economic opportunities in the LM. As a result, job seekers from the LM need to seek work in the larger centres, specifically Cape Town and Winelands area. The majority of the job seekers are likely to be males. This is due to traditional rural patriarchal societies where the role of the women is usually linked to maintaining the house and raising the children, while the men tend to be the ones that migrate to other areas in search of employment.

### **Household income**

Based on the data from the 2011 Census, 5.5% of the population of the LM had no formal income, 2% earned less than R 4 800, 2.8% earned between R 5 000 and R 10 000 per annum, 20.7% between R 10 000 and R 20 000 per annum and 25.3% between R 20 000 and R 40 000 per annum (2016).

The poverty gap indicator produced by the World Bank Development Research Group measures poverty using information from household per capita income/consumption. This indicator illustrates the average shortfall of the total population from the poverty line. This measurement is used to reflect the intensity of poverty, which is based on living on less than R3 200 per month for an average sized household (~ 40 000 per annum). Based on this measure, in the region of 56.3% of the households in the LM live close to or below the poverty line. The figures for the CKD and Western Cape were 62.9% and 50.1% respectively. The low-income levels reflect the limited employment opportunities and dependence on the agricultural sector. This is also reflected in the high unemployment rates. The low-income levels are a major concern given that an increasing number of individuals and households are likely to be dependent on social grants. The low-income levels also result in reduced spending in the local economy and less tax and rates revenue for the LM. This in turn impacts on the ability of the LM to maintain and provide services.

### **Employment**

The 2019 Socio-Economic Profile for the LM notes that the unemployment rate in the LM has fluctuated between 14.8 and 17.7 % over the last 10 years (Figure 3.6). Unemployment in Laingsburg area started at 15.9 per cent in 2008, rising steadily to 17.7% in 2010 and then dropping to 15.6% in 2018. The unemployment in the LM in 2018 (15.6%) is lower than the figure for the CKD (20.7%) and Western Cape (17.7%).

Unemployment Rates for the Western Cape (%)											
Area	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Laingsburg	15.9	16.8	17.7	17.5	17.0	16.2	16.4	14.8	15.4	16.0	15.6
Central Karoo District	20.5	21.4	22.3	22.1	21.6	20.9	21.0	19.6	20.5	21.2	20.7
Western Cape	12.7	14.0	15.4	15.5	15.6	15.5	15.9	15.9	17.1	17.8	17.7

Source: 2019 Socio-Economic Profile for the Laingsburg Municipality

**Figure 3.6: Unemployment rates for Laingsburg Municipality**

### **Education**

Education levels in the LM are reflected by the percentage of the population under the age of 20 that have no education, the percentage that have some primary and or have completed primary school, and the percentage that have passed grade 12 (matric). Based on the 2016 Household Community Survey, 9.2% of the population over the age of 20 had not formal education. This is significantly higher than the figures for Central Karoo (5.8%) and Western Cape (2.4%) and reflects the rural nature of large parts of the LM. The percentage with some primary and primary school was 14.4%, compared to 14.1% and 8.2% for the Central Karoo

District and Western Cape Province, respectively. The percentage with matric was 26.2%, which compares favourably with the 29.9% for the CKD, but is lower than the 35.2% for the Western Cape (Table 3.9).

The education levels in the LM are therefore lower than the Western Cape Provincial figures. This is understandable given the small size of the towns and the large rural nature of the area. However, of interest the matric pass rates in the LM are the highest in the KD. The matric pass rate in the LM was 80.6% in 2018, compared to 79.2% and 71.2 in the Beaufort West and Prince Albert Municipalities, respectively. However, the rate in 2016 was 90.3%. The decrease in the matric pass rate in the LM is an indicator of potential decrease in the quality of education on the area. The drop in the pass rate also reduces the chances of learners gaining access to higher education and employment opportunities. The limited opportunities for gaining access to higher education are reflected in the low percentage of the population in the LM over the age of 20 with undergraduate (0.2%) and post graduate qualifications (0.8%). This is likely to be a function of both the quality of the education available and limited ability of the majority of households to afford the costs associated with accessing tertiary education. As indicated in the data on household income, 56.3% percent of households earn less than R 4000 per month.

**Table 3.9: Population by highest educational level**

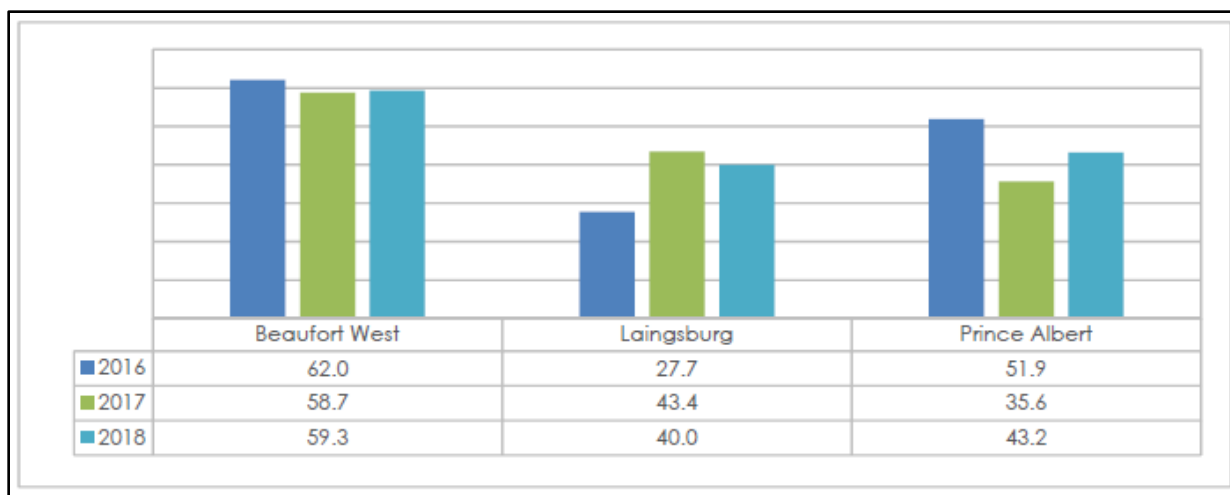
Column	Laingsburg		Central Karoo		Western Cape	
None	9.2%	554	5.8%	2,731	2.4%	99,112
Other	2.1%	124	0.6%	278	0.6%	22,923
Some primary	14.4%	873	14.1%	6,608	8.2%	341,614
Primary	6.6%	398	6.6%	3,110	4.9%	203,457
Some secondary	39.3%	2,377	38.9%	18,272	36.4%	1,510,481
Grade 12 (Matric)	26.3%	1,589	29.9%	14,084	35.2%	1,461,693
Undergrad	0.2%	11	1.3%	630	4.9%	201,354
Post-grad	0.8%	49	1.1%	523	4.5%	187,570
N/A	1.3%	79	1.7%	802	2.9%	120,830

Source: Wazimap: 2016 Household Community Survey

### ***Learner retention***

The learner retention rates<sup>6</sup>, which reflect the number of students that start Grade 12 as a percentage of the number of students that enrolled in Grade 10, are also a cause for concern. Although the retention rates in the LM improved between 2016 (27.7%) and 2018 (40.0%), the 2018 figure still implies that the majority (60%) of the students that started Grade 10 did not make it or enrol in Grade 12. The average for the CKD in 2018 was 55.8% (Figure 3.7). The reasons why learners drop out of school vary but are strongly linked to a range of interrelated socio-economic factors, including lack of disposable income, lack for support from parents, and the perception that a matric qualification will not enhance the chance of finding employment.

<sup>6</sup> Also referred to as the drop-out rate.



Source: 2019 Socio-Economic Profile for the Laingsburg Municipality  
**Figure 3.7: Learner retention for Laingsburg Municipality**

### 3.5.2 Municipal services

#### **Electricity**

Based on the information from the 2016 Community Survey 98.6% of households in the LM had access to electricity. Of this total 84.8% had in-house prepaid meters, while 8% have conventional in-house meters, and 3% had solar power. Only 1.4% of households did not have access to electricity, this is similar to the figures for the CKD (1.29%) and Western Cape (1.85%). Based on the 2016 Community Survey most of the households in the LM (92.8%) are supplied with electricity by the LM (Table 3.10).

**Table 3.10: Population by electricity access**

Column	Laingsburg		Central Karoo		Western Cape	
In-house prepaid meter	84.8%	7,541	88.7%	65,855	77.5%	4,868,696
In-house conventional meter	8%	708	8%	5,925	16.9%	1,059,707
Solar home system	3%	263	0.8%	619	0.1%	4,781
Other	2.2%	195	0.9%	673	0.6%	40,039

Source: Wazimap: 2016 Household Community Survey

#### **Access to water**

Based on the information from the 2016 Community Survey 89.4% of households were supplied by a regional or local service provider. In terms of access to water, 94.5% of the households in the LM has access to water. Of this total 63.3% had piped water inside their houses, while 31.2% relied on piped water inside the yard (Table 3.11). The figures piped water supplied inside of homes for the CKD and Western Cape were 75.7% and 80.7% respectively. The figures for the LM are therefore lower than the district and provincial levels. The figure for water supplied by boreholes (4.7%) is higher than both the CKD (1.1%) and Western Cape (0.2%). This reflects the rural character of large areas of the LM. Based on the 2016 Community Survey most of the households in the LM (94.5%) have access to potable water, with 89.4% being supplied by a regional or local service provider.

**Table 3.11: Population by water source**

Column	Laingsburg		Central Karoo		Western Cape	
Piped water inside house	63.3%	5,632	75.7%	56,235	80.7%	5,069,195
Piped water inside yard	31.2%	2,773	20.5%	15,220	10.8%	680,929
Borehole in yard	4.7%	414	1.1%	841	0.2%	12,143
Borehole outside yard	0.5%	48	0.4%	307	0.1%	6,916
Other	0.3%	29	2.2%	1,644	8.1%	510,547

Source: Wazimap: 2016 Household Community Survey

### **Sanitation**

Based on the information from the 2016 Community Survey, 97.7% of households have access to flush toilets, while 1.5% rely on bucket toilets and only 0.3% reported no access to toilet facilities. The access to flush toilets is marginally higher than the CKD (97.5%) and Western Cape (95/6%). The figures for no access are also lower than CKD (0.4%) and Western Cape (0.7%). Based on the 2016 Community Survey most of the households in the LM (97.7%) have access to flush toilet facilities, with only 0.3% reporting having no access to toilet facilities (Table 3.12).

**Table 3.12: Population by toilet facilities**

Column	Laingsburg		Central Karoo		Western Cape	
Flush toilet	97.7%	8,693	97.5%	72,372	95.6%	5,951,904
Bucket toilet	1.5%	129	0.8%	594	2.9%	180,258
Other	0.5%	42	0.7%	511	0.4%	24,692
None	0.3%	24	0.4%	274	0.7%	45,605

Source: Wazimap: 2016 Household Community Survey

### **Refuse collection**

Based on the information from the 2016 Community Survey, 89.9% of households have their refuse collected by a local authority or private company on a regular basis, while 9.2% rely on their own waste disposal dump. The relatively high number that dispose of their waste at their own dump reflects the rural nature of the LM. The majority of these households are likely to be associated with farms in the LM. Based on the 2016 Community Survey most of the households in the LM (89.7%) have their waste collected on a regular basis by a service provider (Table 3.13).

**Table 3.13: Population by refuse disposal**

Column	Laingsburg		Central Karoo		Western Cape	
Service provider (regularly)	89.2%	7,937	93.9%	69,696	88.7%	5,570,202
Own dump	9.2%	814	3.8%	2,841	2%	125,124
Service provider (not regularly)	0.8%	70	0.5%	374	3%	187,367
Communal dump	0.6%	49	0.6%	450	1.5%	95,488
Other	0.3%	26	1.2%	888	4.8%	301,550

Source: Wazimap: 2016 Household Community Survey

In summary, based on the 2016 Community Survey the service levels in the LM can be described as high. In this regard 92.8% of households are supplied with electricity, 94.5% have access to potable water, with 89.4% being supplied by a regional or local service provider, 97.7% have access to flush toilet facilities, with only 0.3% reporting having no access to toilet facilities, and 89.7% have their waste collected on a regular basis by a service provider.

### 3.5.3 Education and health care facilities

#### ***Education facilities***

In terms of school facilities, there are four primary schools in the LM. Two are located in Laingsburg, one Matjiesfontein and one in Vleiland. Three of the primary schools are government schools and one is private. The majority of the students from the private school completed their schooling at schools located outside of the LM. There is only one secondary school in Laingsburg, the Laingsburg High School. The IDP notes that the Laingsburg High School is under financial pressure. Many of the scholars that attend the school are unable to pay school fees as the majority are from previously disadvantaged areas. Despite this the LM achieved a 100% matric pass rate in 2020. However, as indicated under learner rendition, there is a high drop-out rate between Grade 10 and 12.

The Laingsburg High School was recently declared a non-fee school which reflects the low household income and high poverty levels in the area. Due to staff shortages the high school does not offer maths and science. Pupils that wish to study maths and science therefore have to attend schools in Touws River or Worcester. This requires them to become borders which increases the costs to parents.

Of the four government schools, 50% (2 schools) were equipped with libraries in 2018. However, the shortage of funds as schools, such as the Laingsburg High School, is likely to impact on the quality of the libraries. There are no Further Education and Training (FET) colleges in Laingsburg with the closest one is located in Worcester, which falls outside the Central Karoo District. Further away is Beaufort West, Oudtshoorn, Paarl, Stellenbosch, George and Mosselbay.

#### ***Health care facilities***

Access to healthcare services is a basic human right and one that is directly affected by the number and spread of facilities within their geographical area. In terms of healthcare facilities, Laingsburg had 3 primary healthcare clinics (PHC) in 2018, which consisted of 1 fixed and 2 mobile clinics. In addition, there is also a district hospital, the Laingsburg District Hospital,

located in Laingsburg. There are also three Tuberculosis and one Antiretroviral and 3 clinics/sites (Table 3.14).

There are no health facilities located in the area to the north of the N1 and none in the other rural areas. The rural areas are served by mobile clinic routes. The Department of Provincial Health has identified 17 mobile clinic routes within the LM. At least one route is covered per day, sometimes even two. In the event of medical emergencies patients are transported to either to Laingsburg or the clinic in Matjiesfontein. The LM had 1 ambulance per 10 000 inhabitants in 2018, which is on par with the CKD average of 1 ambulance per 10 000 people. However, the large distances associated with the isolated rural communities impacts on the efficiency of the ambulance services within the LM.

**Table 3.14: Health facilities in Laingsburg Municipality**

Area	PHC Clinics		Community Health Centres	Community Day Centres	Hospitals		Treatment Sites	
	Fixed	Non-fixed			District	Regional	ART Clinics	TB Clinics
Laingsburg	1	2	0	0	1	0	1	3
Central Karoo District	8	10	0	1	4	0	12	22

Source: 2019 Socio-Economic Profile for the Laingsburg Municipality

### **Child health**

Child health is a key indicator of well-being and potential needs. The United Nations Sustainable Development Goals (SDGs) aim to end preventable deaths of new-borns and children under 5 years of age by 2030, with all countries aiming to reduce neonatal mortality to at least as low as 12 per 1 000 live births and under-5 mortalities to at least as low as 25 per 1 000 live births (Source: UN SDG's). Key criteria used to measure child health include immunisation rates<sup>7</sup>, percentage of malnourished children<sup>8</sup>, neonatal mortality rate<sup>9</sup> and birth weight<sup>10</sup>.

<sup>7</sup> **Immunisation:** *The immunisation rate is calculated as the number of children immunised as a percentage of the total number of children less than one year of age. Immunisation protects both adults and children against preventable infectious diseases. Low immunisation rates speak to the need for parents to understand the critical importance of immunisation, as well as the need to encourage parents to have their young children immunised.*

<sup>8</sup> **Malnutrition:** *Expressed as the number of malnourished children under five years per 100 000 people. Malnutrition (either under- or over-nutrition) refers to the condition whereby an individual does not receive adequate amounts or receives excessive amounts of nutrients.*

<sup>9</sup> **Neonatal mortality rate:** *Measured as the number of neonates dying before reaching 28 days of age, per 1 000 live births in a given year. The first 28 days of life (neonatal period) represent the most vulnerable time for a child's survival. The Province's target for 2019 is 6.0 per 1 000 live births.*

<sup>10</sup> **Low birth weight:** *Percentage of all babies born in facility that weighed less than 2 500 g. Low birth weight is associated with a range of both short- and long-term consequences.*

The immunisation coverage rate for children under the age of one in the LM dropped from 80.7% in 2017/18 to 59.1% in 2018/19. The CKD average for 2018/19 was 71.3%. The drop on the immunisation rate is a concern. However, the number of malnourished children under five years (per 100 000) in 2017/18 was 1.3. This decreased to zero in 2018/19. The neonatal mortality rate (NMR) (deaths per 1 000 live births before 28 days of life) for the Laingsburg municipal area remained at zero deaths in 2017/18 and 2018/19. The low-birth weight indicator for Laingsburg increased slightly from 25.7% in 2017/18 to 26.6 % in 2018/19. The decrease in the number of malnourished children under five years and NMR to zero in 2018/19 represents a positive improvement in child health and supports the achievement of SDGs. Although the low birth rate has increased, this has not impacted on the NMR (Table 3.15).

**Table 3.15: Child health statistics for Laingsburg Municipality**

Area	Immunisation Rate		Malnutrition		Neonatal Mortality Rate		Low birth weight	
	2017/18	2018/19	2017/18	2018/19	2017/18	2018/19	2017/18	2018/19
Laingsburg	80.7	59.1	1.3	0.0	0.0	0.0	25.7	26.6
Central Karoo District	73.0	71.3	5.6	3.8	19.9	12.1	21.9	23.4

Source: 2019 Socio-Economic Profile for the Laingsburg Municipality

### 3.6 ECONOMIC OVERVIEW

#### 3.6.1 Karoo Hoogland Municipality<sup>11</sup>

Economic activity in the KH plays a key role in terms of creating employment opportunities and addressing poverty and human development. The ability of households to pay for services such as water, electricity, sanitation, and refuse removal is dependent upon the ability to generate income from economic activities. A slowdown or deterioration in economic activities typically results in job losses and the inability of households to pay for services, which in turn impacts on municipal revenues and the ability to provide and maintain services and municipal infrastructure.

#### Economic sectors

In terms of key sectors, the local economy in the KH was dominated by the agriculture, forestry and fishing which contributed 34% to Gross Value Added (GVA)<sup>12</sup> in 2017, followed by Community services (21%), trade (17%) and transport (12%). The sectors that contributed the least were the mining (0%), electricity (1%) and manufacturing (1%) (Figure 3.8).

The Gross Domestic Product (GDP) growth in KH has been fairly consistent over the years since 1996 until 2014. The rate ranges from nearly 2.2% in 2005 to 0.02% in 1998. The periods when droughts or other factors have played a part are reflected by periodic declines

<sup>11</sup> Information on the local economy is based on the 2019 Socio-Economic Profile of the LM prepared by the Western Cape Provincial Government.

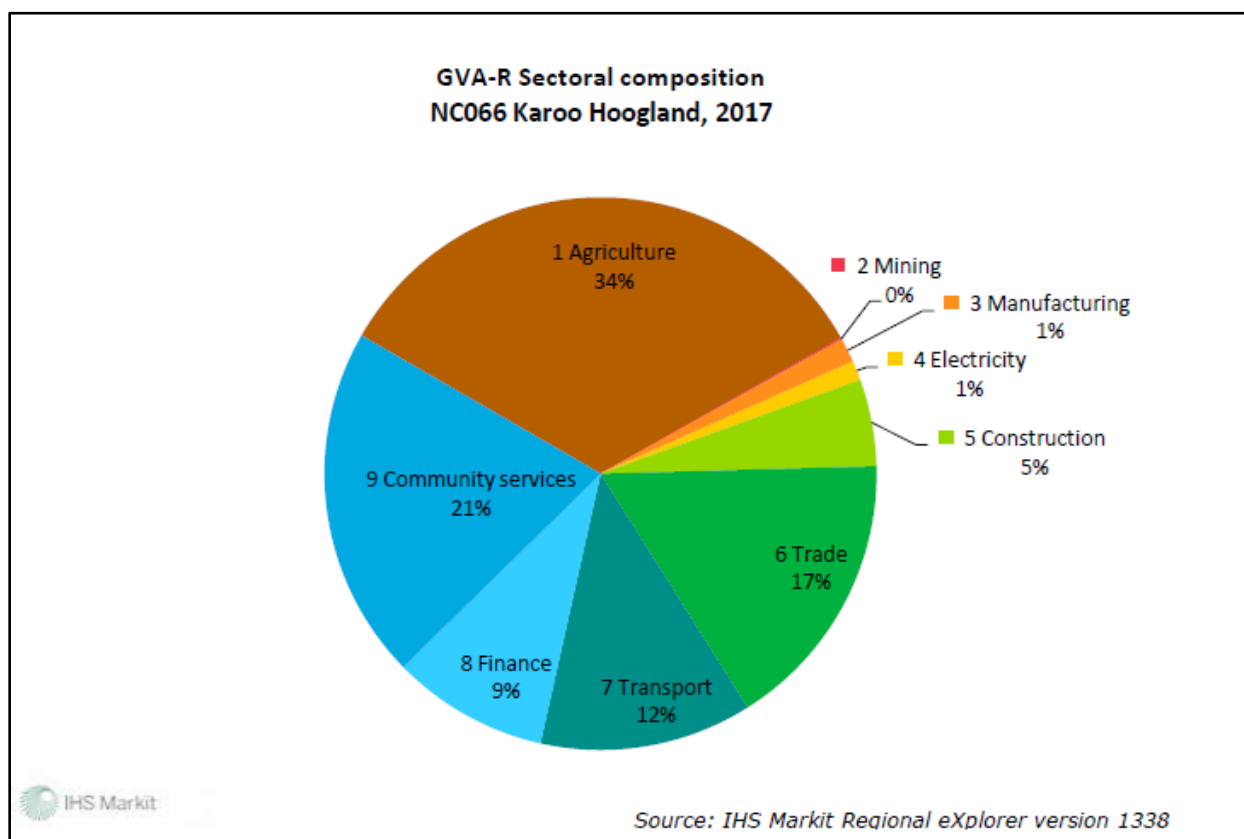
<sup>12</sup> Gross value added (GVA) is an economic productivity metric that measures the contribution of a corporate subsidiary, company, or municipality to an economy, producer, sector, or region. Gross value added (GVA) is the value addition done to a product resulting in the production of final product whereas Gross Domestic Product (GDP) is the total value of products produced in the country.



in 1998, 2002, 2006, 2015. These effects are due to the dominant role played by the agriculture and community services sector. On average the growth over the period was 0,9% which shows the consistent contribution by the agriculture sector over this time period. The steepest decline was experienced during 2005 and 2015 during drought years. The local economy, like the national economy, will also have been negatively impacted by the COVID-19 pandemic and associated lockdowns during 2020 extending into 2021.

### Employment

In terms of employment, the agriculture sector was the most important sector in 2015, making up 33% of all jobs, followed community services (32%), trade (14%), households (11%), and finance (6%). The COVID-19 pandemic is likely to have resulted in job losses during 2020, extending into 2021. The reliance of the KH on the agriculture sector also makes the KH vulnerable to droughts and fluctuations in commodity prices. Added to this the community services sector which accounts for 32% of all jobs is associated with reliance on municipal and government aid and functions.



**Figure 3.8: Key economic sectors in the KH**

### 3.6.2 Laingsburg Municipality<sup>13</sup>

Economic activity in the LM plays a key role in terms of creating employment opportunities and addressing poverty and human development. The ability of households to pay for services such as water, electricity, sanitation, and refuse removal is dependent upon the ability to

<sup>13</sup> Information on the local economy is based on the 2019 Socio-Economic Profile of the LM prepared by the Western Cape Provincial Government.

generate income from economic activities. A slowdown or deterioration in economic activities typically results in job losses and the inability of households to pay for services, which in turn impacts on municipal revenues and the ability to provide and maintain services and municipal infrastructure.

### Economic sectors

In terms of key sectors, the local economy in the LM was dominated by the agriculture, forestry and fishing which contributed 27% to Geographical Gross Domestic Product (GGDP)<sup>14</sup> in 2017, followed by general government (18.7%) and wholesale and retail trade, catering and accommodation (13.4 %). These three sectors made up 56.7% of the LMs GGDP in 2017, estimated to be worth R425.4 million. While there was strong growth of 10.5% in the agriculture, forestry, and fishing sector in 2017, the sector was expected to contract by 2.4 % in 2018 due to the drought at the time. The local economy, like the national economy, will also have been negatively impacted by the COVID-19 pandemic and associated lockdowns during 2020 extending into 2021.

### Employment

In terms of employment, the agriculture, forestry and fishing sector was the most important sector in 2017, making up 31.2% of all jobs, followed by wholesale and retail trade, catering and accommodation (19.1%), community, social and personal services (17.2%) and general government (16.1 %). The agriculture, forestry and fishing sector in the Laingsburg municipal area reported net job losses (-285) between 2008 and 2017. This is a major cause for concern given the key role played by the sector in the Laingsburg economy. The sector which reported the largest increase in jobs between 2008 and 2017 was community and, social & personal services (159) followed by general government (147), wholesale and retail trade, catering, and accommodation (86) and construction (85) sectors. The COVID-19 pandemic is likely to have resulted in job losses during 2020, extending into 2021.

In terms of skills levels, the labour forces in the LM in 2017 consisted mainly of semi-skilled (49.6 %) and low-skilled (34.3 %) workers. The semi-skilled and low-skilled categories (4.2%) grew notably faster than the skilled category (3.2 %) between 2014 and 2018 (Table 3.16). This is due to the relatively undeveloped nature of the local economy and limited demand for skilled workers. Of relevance to the Needs Assessment, the 2019 Socio-Economic Profile for the Laingsburg Municipality notes that the development of renewable energy facilities in the area will result in an increase in the demand for skilled labour which will create skills and development opportunities for low-skilled and semi-skilled workers.

**Table 3.16: Labour forces trends in Laingsburg Municipality**

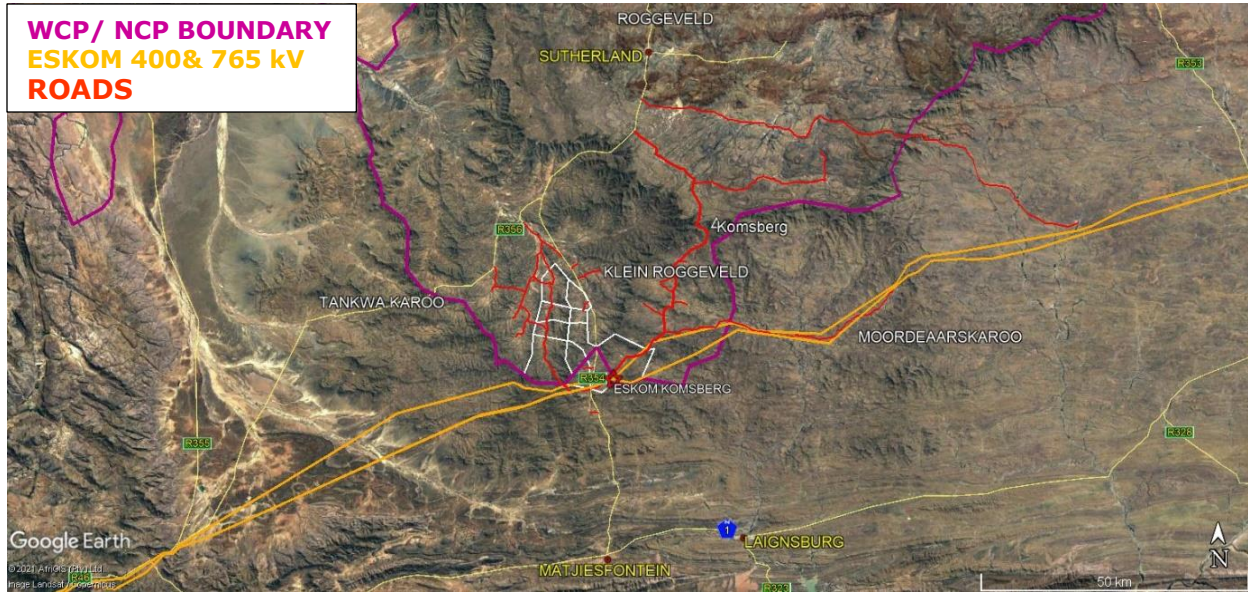
Laingsburg: Trends in labour force skills, 2014 - 2018				
Formal employment by skill	Skill level contribution (%)	Average growth (%)	Number of jobs	
	2017	2014 – 2018e	2017	2018e
Skilled	16.1	3.2	380	392
Semi-skilled	49.6	4.2	1 168	1 198
Low-skilled	34.3	4.2	809	822
<b>Total Laingsburg</b>	<b>100.0</b>	<b>4.0</b>	<b>2 357</b>	<b>2 412</b>

Source: 2019 Socio-Economic Profile for the Laingsburg Municipality

<sup>14</sup> Geographical Gross domestic product (GGDP) is the standard measure of the value added created through the production of goods and services in a region (the LM) during a certain period.

### 3.7 OVERVIEW OF STUDY AREA

The properties associated with the proposed Karreebosch 132 kV powerline options (1A-1C and 2A-2C), 33/132kV substation options (1 and 2) and associated infrastructure are located to the south of the Great Escarpment between the small settlement of Matjiesfontein along the N1 and the town of Sutherland to the north (Figure 3.9). The site straddles the Western Cape (WCP) and Northern Cape (NCP) provincial boundary, with the bulk of the properties located in the NCP. Matjiesfontein and Laingsburg, which form part of the LM, are located ~33.5 km and ~38 km south and south east of the study area respectively. The town of Sutherland, located in the KHM is located ~48 km to the north of the study area.



**Figure 3.9: Location of site properties (white outlines) in relation to the provincial boundary, settlements, roads and existing Eskom infrastructure.**

Access to the study area is via the tarred R354, which links the N1 (Matjiesfontein) to Sutherland. Individual farms are accessed either directly from the R354, or via the Komsberg gravel road and a network of public and private gravel roads linking the R356 (Ceres-Sutherland gravel road) to the R354. The westernmost site properties are only accessible by bakkie or 4x4. The scenic portions of the R354 (Verlatenkloof) and Komsberg Road (Smoushoogte) are located further to the north and east, respectively, not in significant proximity to the affected properties (Photographs 3.1 and 3.2).



**Photograph 3.1: R354-Komsberg road intersection and 756 kV and 400 kV lines viewed from the south.**



**Photograph 3.2: R354 looking north from near entrance to Swartland and Bon Espirange farms**

The study area properties are located in the transition area between the Tankwa Karoo and Roggeveld regions, both of which fall within the eastern extreme of the winter rainfall zone. The R354 is locally considered as a rough demarcation of the transition from the Tankwa Karoo and the Klein Roggeveld. The Moordenaarskaroo located to the east of the Klein Roggeveld and the Roggeveld located on the escarpment are summer rainfall areas. The Roggeveld is well-known for its cold summers, while the low-lying Tankwa Karoo and Moordenaarskaroo are known for their hot summers. The Klein Roggeveld is located at mid-elevation.

The broader region is arid, and essentially consists of veld used for extensive grazing, mainly by small stock (Photograph 3.3). Stock-carrying capacities are low, around 4-6 ha per sheep. Farming operations in the broader region typically consist of a number of (owned or leased) extensive properties, often spread over the various sub-regions to exploit differences in altitude and rainfall season. Base operations are typically located in the Roggeveld and Klein Roggeveld, with most Tankwa Karoo properties only inhabited by the owners during the winter months. Caretaker staff reside permanently on some properties.



**Photograph 3.3: Karroid scrub veld located on Swartland farm to east of R354**

Relatively small areas located in valley floors are used for irrigated cropping activities (Photograph 3.4). Most properties are used for the cropping of fodder, typically for own use. The area's relative isolation makes it ideal for the commercial cropping of vegetable seed (Photograph 3.5).



**Photograph 3.4: Irrigated fodder crops on Saaiplaas north of Eskom Komsberg substation**



**Photograph 3.5: Irrigated onion seed on Klipbanksfontein 198/1 cultivated in one of the valleys at the headwaters of the Tankwa River**

The settlement pattern is sparse, and essentially confined to a number of valleys in predominantly broken terrain (Photograph 3.6 and 3.7). Local tourism in the study area is limited to self-catering guest accommodation facilities on working farms in the area, namely on Fortuin, Saaiplaas and De Kom (3.8). None are in significant proximity to the proposed 132 kV Karreebosch powerline alignment(s).



**Photograph 3.6: Swartland farmstead viewed from the south-west, R354 in background. Swartland, Bon Espirange, Fortuin and Nuwerus are some of the few permanently inhabited farms immediately west of the R354**



**Photograph 3.7: Caretaker staff accommodation (foreground) and farmstead on Klipbanks Fontein 198/1. The property forms part of an operation based in the Moordenaarskaroo**



**Photograph 3.8: Entrance to Nuwerus and Fortein farmsteads. The self-catering accommodation facility on Fortuin is currently leased out to contractors.**

The Klein Roggeveld and southern Tankwa Karoo fall within the Komsberg REDZ. Three wind energy facilities (WEFs) in the study area which recently reached commercial operation, namely the Roggeveld WEF to the west of the R354, and the Karusa and Soetwater WEFs along the Komsberg gravel road (Photograph 3.9). The Roggeveld WEF is partly located on properties which would also be affected by the proposed Karreebosch powerline. The Roggeveld WEF substation has also recently been completed on Bon Espirange farm ~1.4 km west of the R354 (Photograph 3.10).



**Photograph 3.9: Entrance to Roggeveld WEF from the R354 on Swartland**



**Photograph 3.10: Roggeveld WEF substation on Bon Espirange viewed from near the farmstead located to the north-west**

Eskom’s Komsberg substation is located along the Komsberg road, approximately 4.5 km (linear) east of the R354 intersection (Photograph 3.11). Two 400 kV and a 765 kV Eskom lines currently feed into Komsberg in a broad west-east aligned corridor. Eskom’s small Bon Espirange substation (near Komsberg mountain) is not located in significant proximity to the study area.





**Photograph 3.11: Eskom's Komsberg substation, viewed from the entrance along the Komsberg Road**

Environmental approvals (and some amended approvals) have been issued for a number of facilities, including the Karreebosch WEF and the Gunsfontein WEF to the north of the Komsberg Substation. Approvals for two WEFs are currently proposed to the south of the Komsberg Substation, namely Maralla West and Maralla East. Most of the relevant WEFs envisage linking up directly or indirectly into Eskom's Komsberg substation. The lines from the Roggeveld, Karusa and Soetwater WEFs are complete, though the exact alignments could not be established.

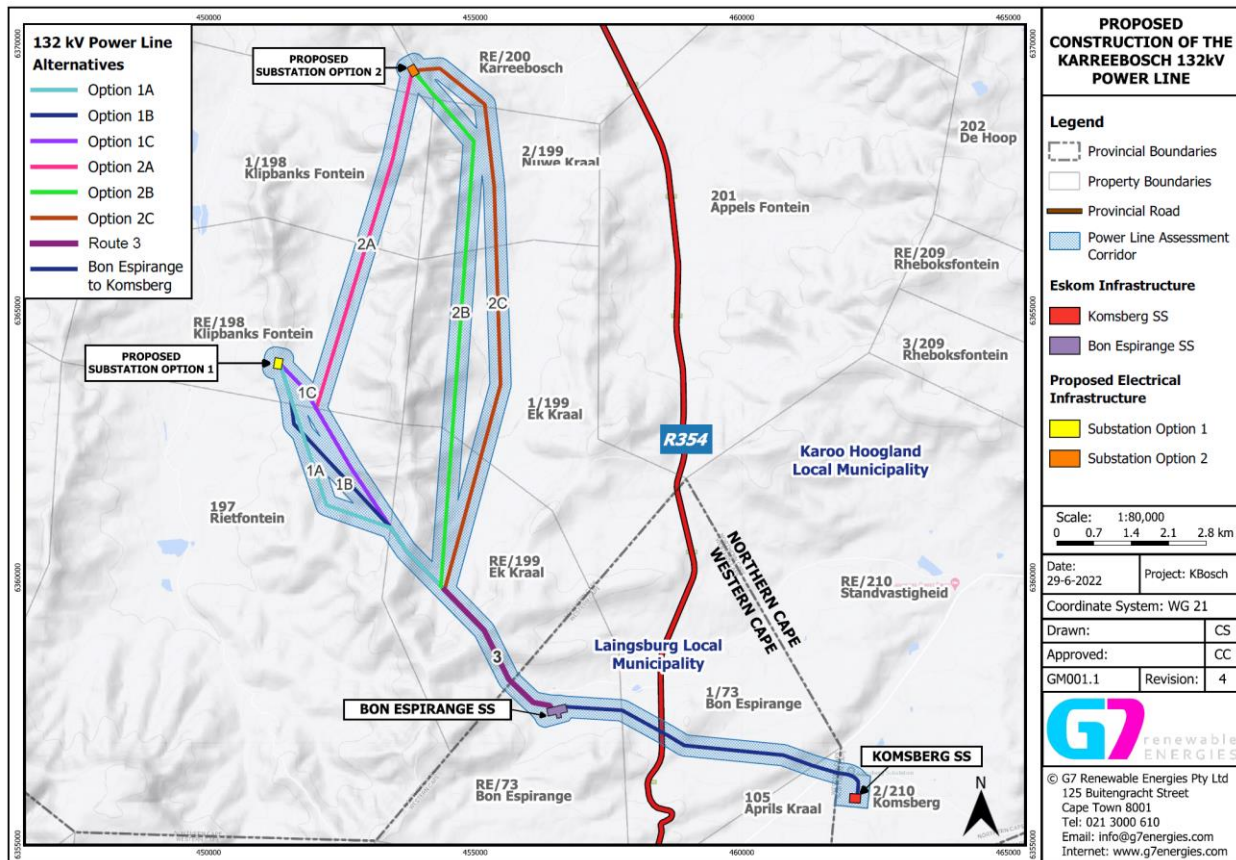
The proposed development involves the construction of an overhead 132 kV powerline, 33/132kV Substation and associated infrastructure to evacuate power from the Karreebosch WEF (EA Ref: 14/12/16/3/3/2/807/AM3 which is currently undergoing a Part 2 EA amendment, final layout and EMPr approval process) into the Komsberg substation via the Bon Espirange substation.

Six (6) OHPL route alternatives (Options 1A, 1B, 1C, 2A, 2B and 2C) are proposed between the Karreebosch WEF onsite 33/132kV substation (with substation alternatives: Option 1 and Option 2) and Route 3 preceding the existing Bon Espirange Substation. As noted above, all of the six OHPL route alternatives follow the same routing from their point of convergence on Remainder of farm Ek Kraal No.199, approximately 3.1 km before the Bon Espirange Substation, to the Komsberg Substation situated on Portion 2 of Farm Standvastigheid No. 210, as per Figure 3.10 below. These alternatives (Figure 3.10) are described below:

- Option 1A (light blue line) (Preferred Alternative).
- Option 1B (dark blue line).
- Option 1C (purple line).
- Option 2A (pink line).
- Option 2B (green line).
- Option 2C (brown line).

Option 1A-C feed out of an internal substation (Option 1) proposed in the south-central portion of the Farm Klipbanksfontein 198/1. Option 2A-C feed out of an internal substation (Option 2) proposed in the south-eastern corner of Wilgebosch Rivier 188/RE. The Bon Espirange substation is located in the central portion of Bon Espirange 73/RE to the south-east of both alternatives. The final section (No 3) that links to the Bon Espirange substation and onto the

Komsberg substation is the same for all six alignments. The line from the Bon Espirange substation to the Komsberg substation to the south east is for all three Euronotus WEFs, namely Karreebosch, Brandvalley and Rietkloof.



**Figure 3.10: Location of transmission line options**

**Option 1A-1C**

Option 1A, 1B and 1C only differ from one another over the initial ~3.6 km section located to the south-east of the Karreebosch Substation Option 1 that traverse portions of Klipbanks Fontein 198/RE and Rietfontein 197/RE (Figure 3.10). The alignments are not located in close proximity to any dwellings on the relevant properties and traverse broken, mountainous terrain. The final ~4.6 km section to the Bon Espirange substation is shared by all of the alternatives and traverses similar terrain in the central portion of Ek Kraal 199/RE. The final ~450 m of the alignment across Ek Kraal 199/RE and the terminal ~880 m across Bon Espirange 73/RE to the Bon Espirange substation traverses the head of a broad valley in which the farmsteads and existing cropping activities on Bon Espirange 73/RE (Bon Espirange) and Bon Espirange 73/1 (Swartland) are located.

A portion of the alignment runs parallel to the new existing overhead powerline feeding in from the Roggeveld WEF. The total lengths of alignments of Option 1A, 1B and 1C are summarised below:

- Option 1A (approximately 14.51 km in length in its entirety from Substation Option 1 to the Komsberg Substation).
- Option 1B (approximately 17.28 km in length in its entirety from Substation Option 1 to the Komsberg Substation).
- Option 1C (approximately 13.91 km in length in its entirety from Substation Option 1 to the Komsberg Substation).

Option 1A is the preferred OHPL option.

### **Option 2A-2C**

Option 2A, 2B and 2C all follow a north-south alignment, are longer than Option 1A-1C, and do not share large common sections. Option 2A is ~ 20.47 km in length. The first 6.1 km traverses mountainous terrain on the eastern portions of Klipbanks Fontein 198/RE and 198/1 before joining the alignment of Option 1C to the Bon Espirange substation. The first section of Option 2A is not located in close proximity to any dwellings.

Option 2B and 2C are located to the east of 2A. Both 2B and 2C link up with alignment of Option 1A-C on Ek kraal 199/RE. The first section of Option 2B and 2C are ~ 10 km in length and traverse the same properties, namely Karreebosch 200/RE, Ek Kraal 199/2 (Nuwekraal), Ek Kraal 199/1 and Ek Kraal 199/RE. The alignment of Option 2B is more direct and affects more broken terrain on the relevant properties. Alternative 2C is located to the east of Option 2B and traverses comparatively lower-lying terrain located to the west of the narrow north-south running valley of Tankwa River (near its source). The alignment is located particularly close to the river on Ek Kraal 199/1 and Ek Kraal 199/RE and traverses cropped areas on the latter. The only inhabited dwelling located in proximity to both alternatives is located 1.6 km (2B) and 1.3 km (2C) to the east on Nuwe Kraal. As indicated above, the final 3.1 km for all three alternatives up to the Bon Espirange substation is the same as the alignment for Alternatives 1 A-C. The total lengths of alignments of Option 2A, 2B and 2C are summarised below:

- Option 2A (approximately 20.47 km in length in its entirety from Substation Option 1 to the Komsberg Substation).
- Option 2B (approximately 16.63 km in length in its entirety from Substation Option 1 to the Komsberg Substation).
- Option 2C (approximately 20.52 km in length in its entirety from Substation Option 1 to the Komsberg Substation).

All six options (1A-1C and 2A-2C) share the same alignment from the Bon Espirange substation to Eskom Komsberg substation runs in north-west to south-east direction and traverses the central portions of Bon Espirange and Swartland, the R354, Komsberg gravel road, and peripheral portions of Farms 105 and 210/RE (both over relatively short distances) near the Komsberg substation. The alignment appears to roughly follow that of the newly constructed Roggeveld WEF line to Eskom Komsberg Substation. The alignment portions to the west of the R354 affect the southern margin of the valley in which Bon Espirange and Swartland farmsteads are located, while that to the east of the road affects veld on broken terrain transitioning into the plain on which Eskom Komsberg is located (Photograph 3.12).



**Photograph 3.12: Newly constructed line from the Roggeveld WEF to Eskom Komsberg substation, seen from access road to Bon Espirange**

In summary, the only portion of the alignment that is located within close proximity to dwellings is the common one(s) feeding in and out from the Bon Espirange substation on Bon Espirange and Swartland (portion west of the R354). This line section appears to follow the alignment of the newly constructed Roggeveld WEF line across the relevant area to the south of the relevant farmstead clusters. The only public road crossings are associated with the common section to Komsberg substation. None of the proposed alternatives traverse farm access roads or currently cropped areas. Option 2C is the only alternative that potentially impacts on arable areas in the Tankwa River valley where crops have been grown. As indicated above, Option 1A is the preferred alignment.

The proposed OHPL project would affect 13 properties belonging to 10 different land owners (Figure 3.10 and Table 3.17). Wilgebosch River 188/RE would only be directly affected by the substation associated with Options 2A-C and possibly very short portions of line feeding out.

**Table 3.17: Directly affected properties (clockwise from N)**

<b>PROPERTY</b>	<b>OWNER</b>	<b>LAND USE</b>	<b>INHABITED</b>	<b>COMMENT</b>
Wilgebosch Rivier 188/RE (Wilgebos)	Breed, Dr Johannes	Winter grazing	Owner + 2 workers (over winter)	Forms part of operations based in the Roggeveld
Karreebosch 200/RE	Mr Ockie Conradie	Grazing	No	Farmed as part of Damslaagte farm (Klein Roggeveld) Based on 2015 information
Ek kraal 199/2 (Nuwekraal)	Steenkamp Trust	Grazing	1 farm worker	Main farming operation located in Stellenbosch
Ek kraal 199/1	Mr Douglas Caldo	Grazing	No	Farmed as part of Swartland farm
Ek kraal 199/RE	Mr Piet Conradie	Grazing	No	Farmed as part of Bonne Esperange farm
Bon Espirange 73/1 (Swartland)	Mr Douglas Caldo	Grazing; Fodder& vegetable seed cropping	Owner + 3 farm worker families	Base farm of multi-farm operation

<b>PROPERTY</b>	<b>OWNER</b>	<b>LAND USE</b>	<b>INHABITED</b>	<b>COMMENT</b>
Standvastigheid 210/RE (Saaiplaas)	Mr Francois Conradie	Grazing; Fodder& vegetable seed cropping; Self-catering guest accommodation	Owner + farm labourer families	Base farm of multi-farm operation
Standvastigheid 210/2 (Komsberg Substation)	Eskom	Substation	No	-
Aprils Kraal 105	Douglas Caldo	Grazing	No	No structures or cropped areas
Bon Espirange 73/RE	Mr Piet Conradie	Grazing; Fodder& vegetable seed cropping	Owner + 1 farm worker family	Base farm of multi-farm operation Dwelling temporarily rented out to WEF contractors
Rietfontein 197/RE	Mr Kobus le Roux	Grazing; Fodder and vegetable seed cropping	Occasional (owner) + 1 worker (permanent)	Farmed as part of Klipfontein farm (Moordenaarskaroo)
Klipbanks fontein 198/RE	Ms Estie le Roux	Grazing; Fodder and vegetable seed cropping	Unknown (possibly supervising staff)	Owner resides in Hartenbosch. Property leased out as part of farming operation based on Fortuin further to the south
Klipbanks fontein 198/RE	Ms. Kobie Conradie	Grazing; Fodder and vegetable seed cropping	2 farm workers	Farmed as part of Soutboskloof farm (Moordenaarskaroo)

As indicated in Table 3.17, Bon Espirange, Swartland and Saaiplaas are the only properties permanently inhabited by their owners. All three serve as base farms on which most of the labour forces also reside. The balance are largely secondary properties farmed as part of main operations based in the local area or further abroad. The farmsteads on Rietfontein and Wilgebos are intermittently occupied by their owners, mainly during winter. Both are used as grazing and cropping outposts for operations based north of Laingsburg. Permanent caretaker staff are tenured on Wilgebos (1), Klipbanks Fontein and Nuwekraal (1). Relatively small portions of all the properties located to the west of the R354 are currently (or historically) used for cropping of cereals (historically), fodder crops and vegetable seed. All properties are primarily used for grazing, largely by sheep. Some of the site properties accommodate infrastructure associated with the Roggeveld WEF or are (or have been) part of proposed WEFs (Photograph 3.13, 3.14 and 3.15).



**Photograph 3.13: Farmstead and outbuildings on Swartland seen from entrance road. Note the turbines (Roggeveld WEF) and overhead line (extreme left) feeding from the Bon Espirange substation to the Eskom Komsberg substation. The impact is contained to the west and south of the farmstead**



**Photograph 3.14: Farmstead and outbuildings on Bon Espirange seen from entrance road. Note the turbines (Roggeveld WEF) and overhead lines feeding into on site Roggeveld WEF substation. The impact is contained to the west and south of the farmstead**



**Photograph 31.5: Shed and farmstead on Rietfontein. The owner mainly resides on the property during the winter months. A caretaker worker permanently lives on the property.**

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## **SECTION 4: ASSESSMENT OF KEY SOCIAL ISSUES**

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### **4.1 INTRODUCTION**

Section 4 provides an assessment of the key social issues identified during the study. The identification of key issues was based on:

- Review of project related information.
- Review of key policy and planning documents.
- Site visit to the study area and comments submitted by key stakeholders.
- Experience/ familiarity of the authors with the area and local conditions.
- Experience with similar projects.

The assessment section is divided into the following sections:

- Assessment of compatibility with relevant policy and planning context (“planning fit”).
- Assessment of social issues associated with the construction phase.
- Assessment of social issues associated with the operation phase.
- Assessment of the “no development” alternative.
- Assessment of cumulative impact on sense of place.

### **4.2 ASSESSMENT OF POLICY AND PLANNING FIT**

The findings of the SIA indicate that investment in renewable energy and the associated energy infrastructure is strongly supported at a national, provincial, and local level. The development of and investment in renewable energy and associated energy distribution infrastructure is supported by the National Development Plan (NDP), New Growth Path Framework and National Infrastructure Plan, which all highlight the importance of energy security and investment in energy infrastructure.

The proposed powerline is also located within the Komsberg REDZ and Central Transmission Corridor. The development of the proposed power line and associated infrastructure is therefore supported by key policy and planning documents.

### **4.3 CONSTRUCTION PHASE SOCIAL IMPACTS**

#### **Potential positive impacts**

- Creation of employment, skills development, and business opportunities.

#### **Potential negative impacts**

- Impacts associated with the presence of construction workers on local communities.
- Impact on local farmers and farming operations.
- Noise, dust and safety impacts of construction related activities and vehicles.
- Increased risk of veld fires.

### 4.3.1 Creation of local employment, skills development and business opportunities

Based on similar projects the construction phase of for the grid connection will extend over a period of approximately 12-24 months and create in the region of 30-50 employment opportunities. Approximately 80% of the jobs will be low-skilled, 15% semi-skilled and 5% skilled. Most of the low and semi-skilled employment opportunities would benefit community members from local towns in the area, including Laingsburg, Matjiesfontein and Sutherland. A percentage of the high skilled positions may also benefit the local community. Most of the employment opportunities are also likely to accrue to HD members from these local communities. Given high local unemployment levels and limited job opportunities in the area, this will represent a localised, social benefit. The remainder of the skilled employment opportunities are likely to be associated with the contactors appointed to construct the grid infrastructure. However, in the absence of specific commitments from the developer to maximise local employment targets the potential opportunities for local employment will be limited. The proponent should therefore commit to employing as many local community members as possible.

The total wage bill will be in the region of R 1.8 million (2022 Rand values). This is based on assumption of R 8 000 per month for low skilled workers, R 12 000 per month for semi-skilled workers and R 25 000 per month for high skilled workers over 12 months. A percentage of the wage bill will be spent in the local economy which will also create opportunities for local businesses in LM. The capital expenditure associated with the construction of grid infrastructure will be ~ R 18 million and will create opportunities for local companies and the regional and local economy. Implementing the enhancement measures listed below can enhance these opportunities. The sector of the local economy that is most likely to benefit from the proposed development is the local service industry. The potential opportunities for the local service sector would be linked to accommodation, catering, cleaning, transport, and security, etc. associated with the construction workers on the site. However, given the relatively small scale of the project and short duration of the construction phase these benefits will be limited.

**Table 4.1: Impact assessment of employment, skills development, and business creation opportunities during the construction phase**

<b>Nature:</b> Creation of employment and business opportunities during the construction phase		
	<b>Without Mitigation</b>	<b>With Enhancement</b>
<b>Extent</b>	Local (2)	Local (3)
<b>Duration</b>	Short term (2)	Short term (2)
<b>Magnitude</b>	Low (2)	Medium (4)
<b>Reversibility</b>	N/A	N/A
<b>Probability</b>	Probable (3)	Highly probable (4)
<b>Significance</b>	Low (18)	Moderate (36)
<b>Status</b>	Positive	Positive
<b>Can impact be enhanced?</b>	Yes	
<b>Enhancement:</b> See below		
<b>Residual impacts:</b> Opportunity to up-grade and improve skills levels in the area.		



### **Assessment of No-Go option**

There is no impact as the current status quo would be maintained.

### **Recommended enhancement measures**

In order to enhance local employment and business opportunities associated with the construction phase the following measures should be implemented:

#### **Employment**

- Where reasonable and practical, the proponent should appoint local contractors and implement a 'locals first' policy, especially for semi and low-skilled job categories. However, due to the low skills levels in the area, the majority of skilled posts are likely to be filled by people from outside the area.
- Where feasible, efforts should be made to employ local contractors that are compliant with Broad Based Black Economic Empowerment (BBBEE) criteria.
- Before the construction phase commences, the proponent should meet with representatives from the LM and KH to establish the existence of a skills database for the area. If such a database exists, it should be made available to the contractors appointed for the construction phase.
- The local authorities, community representatives, and organisations on the interested and affected party database should be informed of the final decision regarding the project and the potential job opportunities for locals and the employment procedures that the proponent intends following for the construction phase of the project.
- Where feasible, training and skills development programmes for locals should be initiated prior to the initiation of the construction phase.
- The recruitment selection process should seek to promote gender equality and the employment of women wherever possible.

#### **Business**

- The proponent should liaise with the LM with regards the establishment of a database of local companies, specifically BBBEE companies, which qualify as potential service providers (e.g., construction companies, catering companies, waste collection companies, security companies etc.) prior to the commencement of the tender process for construction service providers. These companies should be notified of the tender process and invited to bid for project-related work.

Note that while preference to local employees and companies is recommended, it is recognised that a competitive tender process may not guarantee the employment of local labour for the construction phase.

#### **4.3.2 Impact of construction workers on local communities**

The presence of construction workers can pose a potential risk to family structures and social networks. While the presence of construction workers does not in itself constitute a social impact, the manner in which construction workers conduct themselves can impact on local communities. The most significant negative impact is associated with the disruption of existing family structures and social networks. This risk is linked to potentially risky behaviour, mainly of male construction workers, including:

- An increase in alcohol and drug use.
- An increase in crime levels.
- The loss of girlfriends and/or wives to construction workers.
- An increase in teenage and unwanted pregnancies.

- An increase in prostitution.
- An increase in sexually transmitted diseases (STDs), including HIV.

Given the relatively small number of construction workers, namely ~ 30-50, the potential impact on the local community is likely to be negligible.

**Table 4.2: Assessment of impact of the presence of construction workers in the area on local communities**

<b>Nature:</b> Potential impacts on family structures and social networks associated with the presence of construction workers		
	<b>Without Mitigation</b>	<b>With Mitigation</b>
<b>Extent</b>	Local (2)	Local (1)
<b>Duration</b>	Short term (2)	Short term (2)
<b>Magnitude</b>	Low (2)	Very Low (1)
<b>Reversibility</b>	With rehabilitation/mitigation (3)	With rehabilitation/mitigation (3)
<b>Probability</b>	Low Probability (2)	Low Probability (2)
<b>Significance</b>	Low (18)	Low (14)
<b>Status</b>	Negative	Negative
<b>Can impact be mitigated?</b>	Yes, to some degree. However, the risk cannot be entirely eliminated	
<b>Mitigation:</b> See below		
<b>Residual impacts:</b> Impacts on family and community relations that may, in some cases, persist for a long period of time. Also, in cases where unplanned / unwanted pregnancies occur or members of the community are infected by an STD, specifically HIV and or AIDS, the impacts may be permanent and have long term to permanent residual/cumulative impacts on the affected individuals and/or their families and the community.		

### Assessment of No-Go option

There is no impact as the current status quo would be maintained.

### Recommended mitigation measures

The potential risks associated with construction workers can be mitigated. The detailed mitigation measures should be outlined in the Environmental Management Plan (EMP) for the Construction Phase. Aspects that should be covered include:

- Where possible, the proponent should make it a requirement for contractors to implement a 'locals first' policy for construction jobs, specifically for semi and low-skilled job categories.
- The proponent and the contractor(s) should develop a code of conduct for the construction phase. The code should identify which types of behaviour and activities are not acceptable. Construction workers in breach of the code should be subject to appropriate disciplinary action and/or dismissed. All dismissals must comply with the South African labour legislation.
- The proponent and the contractor should implement an HIV/AIDS awareness programme for all construction workers at the outset of the construction phase.

- The contractor should provide transport for workers to and from the site on a daily basis. This will enable the contractor to effectively manage and monitor the movement of construction workers on and off the site.
- The contractor must ensure that all construction workers from outside the area are transported back to their place of residence within 2 days for their contract coming to an end.
- No construction workers, with the exception of security personnel, should be permitted to stay over-night on the site.

#### **4.3.3 Risk to safety, livestock, and farm infrastructure**

The presence of and movement of construction workers on and off the site poses a potential safety threat to local farmers and farm workers in the vicinity of the site. In addition, farm infrastructure, such as fences and gates, may be damaged and stock losses may also result from gates being left open. The presence of construction workers on the site also increases the exposure to local farming operations to the outside world, which, in turn, increases the potential risk of stock theft.

The majority of farmers in the area have been exposed to the construction of the Roggeveld, Karusa and Soetwater WEFs, and therefore have first-hand experience of the impacts associated with the construction of WEFs and the associated infrastructure, such as grid connections. The key issues raised included:

- Impact of construction related activities and movement of construction vehicles on the veld. Due to the sensitivity of the vegetation, disturbances take many years to recover.
- Farm gates left open by contractors and Eskom employees. This was raised as key concern by all the affected landowners interviewed. This has resulted in stock losses and increased vulnerability to stock theft. Mixing of flocks of different breeds (e.g., meat and wool sheep) also impacts on farming operations. Time and resources are also spent on recovering stock that has escaped due to gates being left open.
- Damage to farm fences. The damage to farm fences poses the same risks to farming operations as leaving farm gates open. In many instances damage to fences caused by contractors occurs in remote areas and is not reported to the farmer.
- Lack of awareness amongst contractors of the impacts that their activities can have on farming operations.

The owners of the most directly impacted landowners, namely Bon Espirange 73/RE and Bon Espirange 73/1, indicated that the proposed alignments would be acceptable given that they largely follow alignment of the new Roggeveld WEF line and are confined to the southern margin of their viewshed and do not traverse cropped areas (current or future) on the relevant properties (Conradie, Mr Piet; Caldo – pers. comm).

The only proposed option that was regarded as unsuitable by the relevant landowners was the section of Option 2C that traverses comparatively lower-lying terrain located to the west of the narrow north-south running valley of Tankwa River (near its source). The alignment is located particularly close to the river on Ek Kraal 199/1 and Ek Kraal 199/RE and traverses cropped areas on the latter. The concerns are linked to potential impacts on productive areas located adjacent to the Tankwa River on portions of Ek Kraal 199/RE. The owner of Ek Kraal 199/RE indicated that the alignment of Option 2C would affect historically cropped areas that had the potential for future cultivation. The concern is that the powerline and associated servitude would hamper operations and fragment some of the best land on the property. The owner indicated that they would prefer an alignment located to the west that was located on mountainous, less productive sections of the property. All the other line segments are

acceptable to the relevant owners. The associated substation options were also identified as being acceptable.

The potential risks (safety, livestock, and farm infrastructure) can be effectively mitigated by careful planning and managing the movement of construction workers on the site during the construction phase. However, as indicated by the comments from local farmers in the area, it would appear that these measures have not been effectively implemented during the construction of Roggeveld, Karusa and Soetwater WEFs. The mitigation measures to address these risks are outlined below.

**Table 4.3: Assessment of risk to safety, livestock, and damage to farm infrastructure**

<b>Nature:</b> Potential risk to safety of farmers and farm workers, livestock and damage to farm infrastructure associated with the presence of construction workers on site		
	<b>Without Mitigation</b>	<b>With Mitigation</b>
<b>Extent</b>	Local (2)	Local (1)
<b>Duration</b>	Short term (2)	Short term (2)
<b>Magnitude</b>	Medium (3)	Low (2)
<b>Reversibility</b>	Reversible with compensation (3)	Reversible with compensation (3)
<b>Probability</b>	Highly Probable (4)	Low Probability (2)
<b>Significance</b>	Moderate (40)	Low (16)
<b>Status</b>	Negative	Negative
<b>Can impact be mitigated?</b>	Yes	
<b>Mitigation:</b> See below		
<b>Residual impacts:</b> No, provided losses are compensated for.		

#### **Assessment of No-Go option**

There is no impact as the current status quo would be maintained.

#### **Recommended mitigation measures**

- The proponent should enter into an agreement with the local farmers in the area whereby damages to farm property etc. during the construction phase will be compensated for. The agreement should be signed before the construction phase commences.
- All farm gates must be closed after passing through.
- Contractors appointed by the proponent should provide daily transport for low and semi-skilled workers to and from the site.
- The proponent should consider the option of establishing a Monitoring Forum (MF) that includes local farmers and develop a Code of Conduct for construction workers. This committee should be established prior to commencement of the construction phase. The Code of Conduct should be signed by the proponent and the contractors before the contractors move onto site.
- The proponent should hold contractors liable for compensating farmers and communities in full for any stock losses and/or damage to farm infrastructure that can be linked to

construction workers. This should be contained in the Code of Conduct to be signed between the proponent, the contractors, and neighbouring landowners. The agreement should also cover losses and costs associated with fires caused by construction workers or construction related activities (see below).

- The EMPr must outline procedures for managing and storing waste on site, specifically plastic waste that poses a threat to livestock if ingested.
- Contractors appointed by the proponent must ensure that all workers are informed at the outset of the construction phase of the conditions contained in the Code of Conduct, specifically consequences of stock theft and trespassing on adjacent farms.
- Contractors appointed by the proponent must ensure that construction workers who are found guilty of stealing livestock and/or damaging farm infrastructure are dismissed and charged. This should be contained in the Code of Conduct. All dismissals must be in accordance with South African labour legislation.
- It is recommended that no construction workers, with the exception of security personnel, should be permitted to stay over-night on the site.

#### 4.3.4 Impacts associated with construction related activities

The construction activities on site and movement of heavy construction vehicles during the construction phase has the potential to create noise and dust impacts, damage local roads and create safety impacts for other road users. Based on the findings of the SIA the potential dust and noise impacts associated with the construction of the power line are likely to be negligible. The traffic related impacts associated with the transport of materials to the site are also likely to be limited. However, the construction of renewable energy facilities and the associated grid infrastructure has resulted in increased traffic and damage to local roads in the area. The transport of workers to site and speed at which taxis travelled was raised as a concern. Given the relatively small number of construction workers and the short construction period the traffic related impacts associated with transporting workers to and from the site are likely to be limited. As indicated above, the construction phase also poses a risk to farming operations.

**Table 4.4: Assessment of the impacts associated with construction related activities**

<b>Nature:</b> Potential noise, dust and safety impacts associated with movement of construction related activities and movement of traffic to and from the site		
	<b>Without Mitigation</b>	<b>With Mitigation</b>
<b>Extent</b>	Local (2)	Local (1)
<b>Duration</b>	Short term (2)	Short term (2)
<b>Magnitude</b>	Low (2)	Low (2)
<b>Reversibility</b>	Reversible (1)	Reversible (1)
<b>Probability</b>	Probable (3)	Low Probability (2)
<b>Significance</b>	Low (21)	Low (12)
<b>Status</b>	Negative	Negative
<b>Can impact be mitigated?</b>	Yes	
<b>Mitigation:</b> See below		

**Residual impacts:** If damage to local roads is not repaired then this will affect the other road users and result in higher maintenance costs. The costs will be borne by road users who were not responsible for the damage.

### **Assessment of No-Go option**

There is no impact as it maintains the current status quo.

### **Recommended mitigation measures**

The potential impacts associated with heavy vehicles can be effectively mitigated. The mitigation measures include:

- As indicated above, the proponent should consider the establishment of a Monitoring Forum (MF) to monitor the construction phase and the implementation of the recommended mitigation measures. The MF should be established before the construction phase commences, and should include key stakeholders, including representatives from local farmers and the contractor(s). The MF should also address issues associated with damage to roads and other construction related impacts.
- Ongoing communication with land owners and road users during construction period.
- Establishment of a Grievance Mechanism that provides local farmers and other road users with an effective and efficient mechanism to address issues related to construction related impacts, including damage to local gravel farm roads.
- Implementation of a road maintenance programme throughout the construction phase to ensure that the affected roads maintained in a good condition and repaired once the construction phase is completed.
- Repair of all affected road portions at the end of construction period where required.
- Dust suppression measures must be implemented on un-surfaced roads, such as wetting on a regular basis and ensuring that vehicles used to transport building materials are fitted with tarpaulins or covers.
- All vehicles must be roadworthy, and drivers must be qualified and made aware of the potential road safety issues and need for strict speed limits.

#### **4.3.5 Risk of veld fires**

The presence on and movement of construction workers on and off the site and construction related activities such as welding etc., increases the risk of veld fires which pose a risk to livestock, farm infrastructure and game. The loss of grazing also poses a threat to local livelihoods that are dependent on livestock farming. The risk of veld fires is higher during the dry, windy summer months of December through to March. The local landowners indicated that although the risk of veld fires was low, they do pose a threat to farming operations.

**Table 4.5: Risk posed by veld fires to livestock, farm infrastructure and grazing**

<b>Nature:</b> Potential loss of livestock and grazing and damage to farm infrastructure associated with increased incidence of grass fires		
	<b>Without Mitigation</b>	<b>With Mitigation</b>
<b>Extent</b>	Local (2)	Local (1)
<b>Duration</b>	Short term (2)	Short term (2)
<b>Magnitude</b>	Medium (3)	Low (2)
<b>Reversibility</b>	Reversible with compensation (3)	Reversible with compensation (3)
<b>Probability</b>	Probable (3)	Low Probability (2)
<b>Significance</b>	Moderate (30)	Low (16)
<b>Status</b>	Negative	Negative
<b>Can impact be mitigated?</b>	Yes	
<b>Mitigation:</b> See below		
<b>Residual impacts:</b> No, provided losses are compensated for.		

**Assessment of No-Go option**

There is no impact as it maintains the current status quo.

**Recommended mitigation measures**

The mitigation measures include:

- The proponent should enter into an agreement with the local farmers in the area whereby damages to farm property etc., during the construction phase will be compensated for. The agreement should be signed before the construction phase commences.
- Contractor should ensure that open fires on the site for cooking or heating are not allowed except in designated areas.
- Smoking on site should be confined to designated areas.
- Contractor should ensure that construction related activities that pose a potential fire risk, such as welding, are properly managed and are confined to areas where the risk of fires has been reduced. Measures to reduce the risk of fires include avoiding working in high wind conditions when the risk of fires is greater. In this regard special care should be taken during the high risk dry, windy summer months.
- Contractor should provide adequate fire-fighting equipment on-site, including a fire fighting vehicle.
- Contractor should provide fire-fighting training to selected construction staff.
- No construction staff, with the exception of security staff, to be accommodated on site overnight.
- As per the conditions of the Code of Conduct, in the advent of a fire being caused by construction workers and or construction activities, the appointed contractors must compensate farmers for any damage caused to their farms. The contractor should also compensate the fire-fighting costs borne by farmers and local authorities.

#### 4.4 OPERATIONAL PHASE SOCIAL IMPACTS<sup>15</sup>

The following key social issues are of relevance to the operational phase:

##### Potential positive impacts

- Improved energy security and establishment of energy infrastructure.
- Creation of employment, skills development, and procurement opportunities.
- Generate income for landowners.

##### Potential negative impacts

- The visual impacts and associated impact on sense of place.
- Impact of maintenance activities on farming activities and operations.
- Impact on property values.
- Impact on tourism.

##### 4.4.1 Improved energy security and establishment of energy infrastructure

The proposed power line is essential to enable the development and operation of Karreebosch WEF. The primary goal of the proposed Karreebosch WEF is to improve energy security in South Africa by generating renewable energy. The proposed power line should therefore be viewed within the context of the South Africa's current power supply constraints and the reliance on coal powered energy to meet most of its energy needs. South Africa's energy crisis, which started in 2007 and is ongoing, has resulted in widespread rolling blackouts (referred to as load shedding) due to supply shortfalls. The load shedding has had a significant impact on all sectors of the economy and on investor confidence. The mining and manufacturing sector have been severely impacted and will continue to be impacted until such time as there is a reliable supply to energy. Load shedding in the first six months of 2015 was estimated to have cost South African businesses R13.72 billion in lost revenue with an additional R716 million was spent by businesses on backup generators<sup>16</sup>. A survey of 3 984 small business owners found that 44% said that they had been severely affected by load shedding with 85% stating that it had reduced their revenue, with 40% of small businesses losing 20% or more of revenue during due to load shedding period<sup>17</sup>.

**Table 4.6: Improve energy security, reduce reliance on coal generated power sector**

<b>Nature:</b> Development of infrastructure to improve energy security and reduce reliance on coal		
	<b>Without Mitigation<sup>18</sup></b>	<b>With Mitigation<sup>19</sup></b>
<b>Extent</b>	Local, Regional and National (4)	Local, Regional and National (4)
<b>Duration</b>	Long term (4)	Long term (4)
<b>Magnitude</b>	Medium (3)	Medium (3)
<b>Reversibility</b>	N/A	N/A
<b>Probability</b>	Highly Probable (4)	Definite (5)

<sup>15</sup> It must be noted that the Grid EA & Operational EMPr will become the responsibility of Eskom during the operational phase

<sup>16</sup> Goldberg, Ariel (9 November 2015). "The economic impact of load shedding: The case of South African retailers" (PDF). Gordon Institute of Business Science. p. 109

<sup>17</sup> "How does load shedding affect small business in SA?". *The Yoco Small Business Pulse (3: Q1 2019)*:

<sup>18</sup> Assumes power line is not established

<sup>19</sup> Assumes power line is established



<b>Significance</b>	Moderate (44)	Moderate (55)
<b>Status</b>	Negative	Positive
<b>Can impact be enhanced?</b>	Yes	
<b>Enhancement:</b> See below		
<b>Residual impacts:</b> Improved energy security and benefit for economic development and investment, reduction in CO <sub>2</sub> emission and reduction in water consumption for energy generation.		

### Assessment of No-Go option

There is no impact as it maintains the current status quo.

### Recommended mitigation measures

Should the proposed grid connection infrastructure be approved the proponent should:

- Maximise the number of employment opportunities for local community members, where feasible.
- Implement training and skills development programs for members from the local community.
- Maximise opportunities for local content and procurement.

#### 4.4.2 Creation of employment, skills development, and business opportunities

The potential employment, skills development and business-related opportunities associated with the power line and substation will be limited and largely confined to periodic maintenance and repairs. The potential socio-economic benefits are therefore likely to be limited. The potential opportunities can however be enhanced if a local service provider is appointed to undertake the work required. This may involve providing training and skills development to enable a locally based service provider to provide the required services.

**Table 4.7: Impact assessment of employment, skills development and business creation opportunities**

<b>Nature:</b> Creation of employment, skills development and business opportunities associated with the operational phase		
	<b>Without Mitigation</b>	<b>With Enhancement</b>
<b>Extent</b>	Local and Regional (1)	Local and Regional (2)
<b>Duration</b>	Long term (4)	Long term (4)
<b>Magnitude</b>	Low (2)	Medium (4)
<b>Reversibility</b>	N/A	N/A
<b>Probability</b>	Low Probability (2)	Highly Probable (4)
<b>Significance</b>	Low (14)	Moderate (40)
<b>Status</b>	Positive	Positive
<b>Reversibility</b>	N/A	
<b>Can impact be enhanced?</b>	Yes	
<b>Enhancement:</b> See below		

**Residual impacts:** Creation of permanent employment and skills and development opportunities for members from the local community and creation of additional business and economic opportunities in the area

### Recommended enhancement measures

The enhancement measures listed in Section 4.4.1, i.e., to enhance local employment and business opportunities during the construction phase, also apply to the operational phase.

In addition, the proponent should investigate providing training and skills development to enable locally based service providers to provide the required services for the maintenance of the powerline and other aspects for the proposed wind energy facility.

### 4.4.3 Generate income for affected landowners

The proponent will be required to either purchase the land or enter into a lease/servitude agreement with the affected landowners for the use of the land for the establishment of the proposed transmission line and substation. Based on the findings of the SIA, the area is prone to droughts and farming operations can be challenging. Any additional source of income therefore represents a significant benefit for the affected landowner(s). The additional income would assist to reduce the risks to their livelihoods posed by droughts and fluctuating market prices for sheep and farming inputs, such as fuel, feed etc. The additional income would improve economic security of farming operations, which in turn would improve job security of farm workers and benefit the local economy.

**Table 4.8: Assessment of benefits associated with income generated for affected farmer(s)**

<b>Nature:</b> The generation of additional income represents a significant benefit for the local affected farmer(s) and reduces the risks to their livelihoods posed by droughts and fluctuating market prices for sheep and farming inputs, such as feed etc.		
	<b>Without Mitigation</b>	<b>With Enhancement</b>
<b>Extent</b>	Local and Regional (1)	Local and Regional (2)
<b>Duration</b>	Long term (4)	Long term (4)
<b>Magnitude</b>	Low (2)	Medium (3)
<b>Reversibility</b>	N/A	N/A
<b>Probability</b>	Probability (3)	Definite (5)
<b>Significance</b>	Low (21)	Moderate (45)
<b>Status</b>	Positive	Positive
<b>Reversibility</b>	N/A	
<b>Can impact be enhanced?</b>	Yes	
<b>Enhancement:</b> See below		
<b>Residual impacts:</b> Support for local agricultural sector and farming		

### Assessment of No-Go option

There is no impact as it maintains the current status quo.

### Recommended enhancement measures

Implement agreements with affected landowners.

#### 4.4.4 Visual impact and impact on sense of place

The area's existing sense of place has been altered by existing transmission lines associated with the Komsberg substation and the establishment of a number of WEFs. The proposed power line is also located within the Komsberg REDZ and Central Transmission Corridor. The area has therefore been identified as suitable for the establishment of the grid infrastructure. The potential impact on the broader areas sense of place associated with the proposed grid connection will therefore be low.

As indicated above, the owners of the most directly impacted landowners, namely Bon Espirange and Swartland, both indicated that all of the proposed alignments were acceptable as the alignments largely follow the new Roggeveld WEF line and remain confined to the southern margin of their viewshed (Conradie, Mr Piet; Calldo – pers. comm). None of the other affected landowners interviewed raised concerns regarding the potential visual impact on the areas sense of place.

**Table 4.9: Visual impact and impact on sense of place**

<b>Nature:</b> Visual impact associated with the proposed grid infrastructure and the potential impact on the area's sense of place.		
	<b>Without Mitigation</b>	<b>With Mitigation<sup>20</sup></b>
<b>Extent</b>	Local (2)	Local (2)
<b>Duration</b>	Long term (4)	Long term (4)
<b>Magnitude</b>	Low (2)	Low (2)
<b>Reversibility</b>	Reversible (1)	Reversible (1)
<b>Probability</b>	Probable (3)	Probable (3)
<b>Significance</b>	Low (27)	Low (27)
<b>Status</b>	Negative	Negative
<b>Can impact be mitigated?</b>	Yes	
<b>Mitigation:</b> See below		
<b>Residual impacts:</b> Potential impact on current rural sense of place		

### Assessment of No-Go option

There is no impact as it maintains the current status quo.

### Recommended mitigation measures

No mitigation measures are required.

<sup>20</sup> Not possible to effectively mitigated visual impacts

#### **4.4.5 Impact on farming operations during maintenance<sup>21</sup>**

The presence on and movement of maintenance workers on and off the site poses a potential risk to farming operations. Farm fence and gates may be damaged and stock losses may also result from gates being left open. The presence of maintenance workers on the site also increases the exposure of their farming operations and livestock to the outside world, which, in turn, increased the potential risk of stock theft and crime.

As indicated above, the majority of farmers in the area have been exposed to the construction of the Roggeveld, Karusa and Soetwater WEFs, and therefore have first-hand experience of the impacts associated with the construction of WEFs and the associated infrastructure, such as grid connections. The key issues raised are linked to the construction phase but are also valid for the maintenance phase. These include:

- Impact of maintenance related activities and movement of maintenance vehicles on the veld. Due to the sensitivity of the vegetation disturbances take many years to recover.
- Farm gates left open by maintenance contractors and Eskom employees. This was raised as key concern by all the affected landowners interviewed. This has resulted in stock losses and increased vulnerability to stock theft. Mixing of flocks of different breeds (e.g., meat and wool sheep) also impacts on farming operations. Time and resources are also spent on recovering stock that has escaped due to gates being left open.
- Damage to farm fences. The damage to farm fences poses the same risks to farming operations as leaving farm gates open. In many instances damage to fences caused by contractors occurs in remote areas and is not reported to the farmer.
- Lack of awareness amongst contractors of the impacts that their activities can have on farming operations.

Based on experience with maintenance of the existing Eskom power lines this is an issue that will need to be addressed. The potential risks (safety, livestock, and farm infrastructure) can be effectively mitigated by ensuring the maintenance teams take care to ensure that gates are kept closed and affected property owners are kept informed about timing of maintenance operations. Mitigation measures to address these risks are outlined below. However, the findings of the SIA indicate that despite measures being in place, these measures are not being implemented affectively by the contractors working in the area.

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<sup>21</sup> The impacts are similar to the impacts associated with construction phase.

**Table 4.10: Assessment of risk to farming operations and damage to farm infrastructure**

<b>Nature:</b> Potential risk to safety to farming operations and livestock associated with the presence of maintenance workers on the site		
	<b>Without Mitigation</b>	<b>With Mitigation</b>
<b>Extent</b>	Local (2)	Local (2)
<b>Duration</b>	Short term (2)	Short term (2)
<b>Magnitude</b>	Medium (3)	Low (2)
<b>Reversibility</b>	Recoverable with compensation paid for stock losses and damage to farm infrastructure etc. (3)	Recoverable with compensation paid for stock losses and damage to farm infrastructure etc. (3)
<b>Probability</b>	Highly Probable (4)	Probable (3)
<b>Significance</b>	Moderate (40)	Low (27)
<b>Status</b>	Negative	Negative
<b>Can impact be mitigated?</b>	Yes	
<b>Mitigation:</b> See below		
<b>Residual impacts:</b> No, provided losses are compensated for.		

#### **Assessment of No-Go option**

There is no impact as the current status quo would be maintained.

#### **Recommended mitigation measures**

- Affected property owners should be notified in advance of the timing and duration of maintenance activities.
- Maintenance teams must ensure that all farm gates must be closed after passing through.
- Property owners should be compensated for damage to farm property and or loss of livestock or game associated maintenance related activities.
- Movement of traffic and maintenance related activities should be strictly contained within designated areas associated with transmission lines and substations.
- Strict traffic speed limits must be enforced on the farm.
- No maintenance workers should be allowed to stay over-night on the affected properties.

#### **4.4.6 Potential impact on property values**

A literature review of the impact of wind farms on property values was undertaken as part of the SIA. It is assumed that the findings can also be applied to transmission lines. It should be noted that the review does not constitute a property evaluation study and merely seeks to comment on the potential impact of wind farms (transmission lines) on property values based on the findings of studies undertaken overseas. The assessment rating is based on the findings of the review. In total five articles were identified and reviewed namely:

- Stephen Gibbons (April 2014): Gone with the wind: Valuing the Visual Impacts of Wind turbines through house prices. London School of Economics and Political Sciences & Spatial Economics Research Centre, SERC Discussion Paper 159.
- Review of the Impact of Wind Farms on Property Values, Urbis Pty Ltd (2016): Commissioned by the Office of Environment and Heritage, NSW, Australia.
- Yasin Sunak and Reinhard Madlener (May 2012): The Impact of Wind Farms on Property Values: A Geographically Weighted Hedonic Pricing. School of Business and Economics / E.ON Energy Research Center, RWTH Aachen University. Model Working Paper No. 3/2012.
- Martin D. Heintzelman and Carrie M. Tuttle (March 3, 2011): Values in the Wind: A Hedonic Analysis of Wind Power Facilities. Economics and Financial Studies School of Business, Clarkson University.
- Ben Hoen, Jason P. Brown, Thomas Jackson, Ryan Wiser, Mark Thayer and Peter Cappers (August 2013): A Spatial Hedonic Analysis of the Effects of Wind Energy Facilities on Surrounding Property Values in the United States. Ernest Orlando Lawrence Berkeley National Laboratory.

Based on the findings of the literature review the potential impact of WEFs on rural property values is likely to be low, specifically for farms that are farmed as productive farms. The same would apply to transmission lines. As indicated above, the potential loss of productive land and the associated potential impact on property values can also be minimised by careful planning and siting of the pylons and access roads. The potential impact on property values was not raised as a concern by local landowners.

**Table 4.11: Assessment of potential impact on property values and operations**

<b>Nature:</b> Visual impact associated with the proposed transmission lines and associated potential impact on property values.		
	<b>Without Mitigation</b>	<b>With Mitigation</b>
<b>Extent</b>	Local (2)	Local (1)
<b>Duration</b>	Long term (4)	Long term (4)
<b>Magnitude</b>	Low (2)	Low (2)
<b>Reversibility</b>	N/A	N/A
<b>Probability</b>	Low Probability (2)	Low Probability (2)
<b>Significance</b>	Low (16)	Low (14)
<b>Status</b>	Negative	Negative
<b>Can impact be mitigated?</b>	Yes	
<b>Enhancement:</b> See below		
<b>Residual impacts:</b> Potential impact on current rural sense of place and property values		

#### **Assessment of No-Go option**

There is no impact as it maintains the current status quo.

#### **Recommended mitigation measures**

The recommendations contained in the VIA should be implemented.

#### 4.4.7 Potential impact on tourism

A review of international literature in the impact of wind farms was undertaken as part of the SIA. The findings are also likely to be relevant to transmission lines, specifically transmission lines associated with WEFs. Three articles were reviewed, namely:

- Atchison, (April 2012). Tourism Impact of Wind Farms: Submitted to Renewables Inquiry Scottish Government. University of Edinburgh.
- Glasgow Caledonian University (2008). The economic impacts of wind farms on Scottish tourism. A report prepared for the Scottish Government.
- Regeneris Consulting (2014). Study into the Potential Economic Impact of Wind Farms and Associated Grid Infrastructure on the Welsh Tourism Sector.

Based on the findings of the review there is limited evidence to suggest that WEFs impact on the tourism in the area. The same would apply to transmission lines. The potential impact on tourism was not raised as a concern by local landowners.

**Table 4.12: Impact on tourism in the region**

<b>Nature:</b> Potential impact of the on local tourism operations and activities		
	<b>Without Mitigation</b>	<b>With Mitigation</b>
<b>Extent</b>	Local (2)	Local (2)
<b>Duration</b>	Long term (4)	Long term (4)
<b>Magnitude</b>	Very Low (1)	Very Low (1)
<b>Reversibility</b>	N/A	N/A
<b>Probability</b>	Low Probability (2)	Low Probability (2)
<b>Significance</b>	Low (14)	Low (14)
<b>Status</b>	Negative	Negative
<b>Can impact be mitigated?</b>	Yes	
<b>Enhancement:</b> See below		
<b>Residual impacts:</b> Potential impact on current rural sense of place and future tourism opportunities in the area.		

#### Assessment of No-Go option

There is no impact as it maintains the current status quo.

#### Recommended mitigation measures

The recommendations contained in the VIA should be implemented.

#### 4.5 CUMULATIVE IMPACT ON SENSE OF PLACE

The Scottish Natural Heritage (2005) describes a range of potential cumulative landscape impacts associated with wind farms on landscapes. These issues raised in these guidelines as to what defines a cumulative impact are also regarded as pertinent to transmission lines. The relevant issues identified by Scottish Natural Heritage study include:

- Combined visibility (whether two or more transmission lines) will be visible from one location).
- Sequential visibility (e.g. the effect of seeing two or more two or more transmission lines) along a single journey, e.g. road or walking trail).
- The visual compatibility of different two or more transmission lines in the same vicinity.
- Perceived or actual change in land use across a character type or region.
- Loss of a characteristic element (e.g. viewing type or feature) across a character type caused by developments across that character type.

There are existing transmission lines associated with the Komsberg substation. Several WEFs and associated power lines have been constructed and or are proposed in the area. The potential for cumulative impacts associated with combined visibility (whether two or more power lines will be visible from one location) and sequential visibility (e.g., the effect of seeing two or more power lines along a single journey, e.g., road or walking trail) does therefore exist. However, the cumulative impact on the areas sense of place is likely to be low. None of the affected property owners interviewed identified visual impacts as a concern. The area also falls within the Komsberg REDZ and Central Transmission Corridor. The area has therefore been identified as suitable for the establishment of the grid infrastructure. None of the landowners interviewed raised concerns regarding the potential visual impact on the areas sense of place.

**Table 4.13: Cumulative impacts on sense of place and the landscape**

<b>Nature:</b> Visual impacts associated with the establishment of associated grid infrastructure and the potential impact on the area's rural sense of place and character of the landscape.		
	<b>Overall impact of the proposed project considered in isolation</b>	<b>Cumulative impact of the project and other projects in the area</b>
<b>Extent</b>	Local (2)	Regional (2)
<b>Duration</b>	Long term (4)	Long term (4)
<b>Magnitude</b>	Low (2)	Medium (3)
<b>Reversibility</b>	Reversible (1)	Reversible (1)
<b>Probability</b>	Probable (3)	Highly Probable (4)
<b>Significance</b>	Low (27)	Moderate (40)
<b>Status</b>	Negative	Negative
<b>Can impacts be mitigated?</b>	Limited	
<b>Mitigation:</b> See below		

#### Assessment of No-Go option

There is no impact as it maintains the current status quo.

#### Recommended mitigation measures



No mitigation measures are required.

#### 4.6 ASSESSMENT OF NO-DEVELOPMENT OPTION

The proposed power line and substation are essential to enable the proposed Karreebosch WEF to connect to the national electricity grid to address the current energy supply constraints and reduce South Africa’s reliance on coal generated energy. As indicated above, energy supply constraints and associated load shedding have had a significant impact on the economic development of the South African economy. South Africa also relies on coal-powered energy to meet more than 90% of its energy needs. South Africa is therefore one of the highest per capita producers of carbon emissions in the world and Eskom, as an energy utility, has been identified as the world’s second largest producer of carbon emissions.

The No-Development option would represent a lost opportunity for South Africa to improve energy security and supplement its current energy needs with renewable energy. Given South Africa’s current energy security challenges and its position as one of the highest per capita producers of carbon emissions in the world, this would represent a negative social cost.

**Table 4.14: Assessment of no-development option**

<b>Nature:</b> The no-development option would result in the lost opportunity for South Africa to improve energy security and reduce reliance on coal power.		
	<b>Without Mitigation<sup>22</sup></b>	<b>With Mitigation<sup>23</sup></b>
<b>Extent</b>	Local-National (3)	Local-National (3)
<b>Duration</b>	Long term (4)	Long term (4)
<b>Magnitude</b>	Medium (3)	Medium (3)
<b>Reversibility</b>	Reversible (1)	Reversible (1)
<b>Probability</b>	Highly Probable (4)	Highly Probable (4)
<b>Significance</b>	Moderate (44)	Moderate (44)
<b>Status</b>	Negative	Positive
<b>Can impact be mitigated?</b>	Yes	
<b>Enhancement:</b> See below		
<b>Residual impacts:</b> Improved energy security and benefit for economic development and investment, reduction in CO <sub>2</sub> emission and reduction in water consumption for energy generation.		

#### Recommended enhancement measures

The proposed grid infrastructure should be developed, and the mitigation and enhancement measures identified in the SIA and other specialist studies should be implemented.

<sup>22</sup> Assumes power line is not developed

<sup>23</sup> Assumes power line is developed

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## **SECTION 5: KEY FINDINGS AND RECOMMENDATIONS**

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### **5.1 INTRODUCTION**

Section 5 lists the key findings of the study and recommendations. These findings are based on:

- A review of key planning and policy documents pertaining to the area.
- Site visit and semi-structured interviews with interested and affected parties.
- A review of social and economic issues associated with similar developments.
- A review of relevant literature on social and economic impacts.
- The experience of the authors with other renewable energy projects in South Africa

### **5.2 SUMMARY OF KEY FINDINGS**

The key findings of the study are summarised under the following sections:

- Fit with policy and planning.
- Construction phase impacts.
- Operational phase impacts.
- Cumulative impacts.
- Decommissioning phase impacts.
- No-development option.

#### **5.2.1 Policy and planning issues**

The development of renewable energy and the associated energy infrastructure is strongly supported at a national, provincial, and local level. The development of and investment in renewable energy and associated energy distribution infrastructure is supported by the National Development Plan (NDP), New Growth Path Framework and National Infrastructure Plan, which all highlight the importance of energy security and investment in energy infrastructure. The proposed powerline is also located within the Kombserg REDZ and Central Transmission Corridor. The area has therefore been identified as suitable for the establishment of renewable energy facilities and the associated grid infrastructure. The development of the proposed power line, substation and associated infrastructure is therefore supported by key policy and planning documents.

#### **5.2.2 Construction phase impacts**

The key social issues associated with the construction phase include:

##### **Potential positive impacts**

- Creation of employment and business opportunities, and the opportunity for skills development and on-site training.

The construction phase will extend over a period of approximately 12-18 months and create in the region of 30-50 employment opportunities. The total wage bill will be in the region of R 1.8 million (2022 Rand values). Most of the low and semi-skilled employment opportunities

are likely to benefit residents from local towns in the area, including Matjiesfontein, Laingsburg and Sutherland. Most the beneficiaries are likely to be HD members of the community. This would represent a short term positive social benefit in an area with limited employment opportunities. A percentage of the wage bill will be spent in the local economy which will also create opportunities for local businesses in KH and LM.

The capital expenditure associated with the construction of power line will be ~18 million (2022 Rand values) and will create opportunities for the local and regional and local economy. The sector of the local economy most likely to benefit from the proposed development is the local service industry. The potential opportunities for the local service sector would be linked to accommodation, catering, cleaning, transport, and security, etc. associated with the construction workers on the site. However, given the relatively small scale of the development and short construction period the benefits will be limited.

### Potential negative impacts

- Impacts associated with the presence of construction workers on local communities.
- Noise, dust, and safety impacts of construction related activities and vehicles.
- Risk of veld fires.
- Risks posed to farming activities by construction workers.

The findings of the SIA indicate that the significance of the potential negative impacts is likely to be negligible. With mitigation they are rated as **Low Negative**. The potential negative impacts associated with the proposed construction of the power line can therefore be effectively mitigated if the recommended mitigation measures are implemented. However, experience with the construction of WEFs in the area is that despite measures being in place, these measures are not being implemented affectively by the contractors working in the area. This will need to be addressed.

Table 5.1 summarises the significance of the impacts associated with the construction phase.

**Table 5.1: Summary of social impacts during construction phase**

<b>Impact</b>	<b>Significance No Mitigation / Enhancement</b>	<b>Significance With Mitigation / Enhancement</b>
<b>Creation of employment and business opportunities</b>	Low (Positive)	Moderate (Positive)
<b>Presence of construction workers and potential impacts on family structures and social networks</b>	Low (Negative)	Low (Negative)
<b>Impact of construction activities and vehicles</b>	Low (Negative)	Low (Negative)
<b>Risk of veld fires</b>	Moderate Negative)	Low (Negative)
<b>Safety risk, stock theft and damage to farm infrastructure associated with presence of construction workers</b>	Moderate Negative)	Low (Negative)

### 5.2.3 Operational phase impacts

The benefits associated with the Karreebosch WEF are dependent upon being able to connect to the national grid. The key social issues associated with the operational phase include:

### Potential positive impacts

- Improve energy security and establishment of energy infrastructure.
- Creation of employment, skills development, and local procurement opportunities.
- Generate income for landowners.

### Potential negative impacts

- The visual impacts and associated impact on sense of place.
- Risks posed to farming activities by maintenance workers.
- Impact on property values.
- Impact on tourism.

The findings of the SIA indicate that the significance of the potential negative impacts is likely be **Low Negative** if the required mitigation measures are effectively implemented. The only proposed alternative regarded as unsuitable by the affected landowners was the southern section of Option 2C that traverses comparatively lower-lying terrain located to the west of the Tankwa River (near its source). The alignment is located particularly close to the river on Ek Kraal 199/1 and Ek Kraal 199/RE and traverses cropped areas on the latter. The owner of Ek Kraal 199/RE indicated that the alignment of Option 2C would affect historically cropped areas that had the potential for future cultivation.

The significance of the impacts associated with the operational phase are summarised in Table 5.2.

**Table 5.2: Summary of social impacts during operational phase**

<b>Impact</b>	<b>Significance No Mitigation / Enhancement</b>	<b>Significance With Mitigation / Enhancement</b>
<b>Improve energy security and establishment of energy infrastructure</b>	Moderate (Negative) <sup>24</sup>	Moderate (Positive) <sup>25</sup>
<b>Creation of employment and business opportunities during maintenance</b>	Low (Positive)	Moderate (Positive)
<b>Generate income for landowners</b>	Low (Positive)	Moderate (Positive)
<b>Visual impact and impact on sense of place</b>	Low (Negative)	Low (Negative)
<b>Safety risk, stock theft and damage to farm infrastructure associated with presence of maintenance workers</b>	Moderate (Negative)	Low (Negative)
<b>Impact on property values</b>	Low (Negative)	Low (Negative)
<b>Impact on tourism</b>	Low (Negative)	Low (Negative)

#### 5.2.4 Cumulative impact on sense of place

There are a number of existing power lines in the area associated with the Komsberg substation. The potential for cumulative impacts associated with combined visibility (whether two or more power lines will be visible from one location) and sequential visibility (e.g., the

<sup>24</sup> Assumes power line is not developed

<sup>25</sup> Assumes power line is developed

effect of seeing two or more power lines along a single journey, e.g., road or walking trail) does therefore exist. However, the cumulative impact on the areas sense of place is likely to be low. The area also falls within the Komsberg REDZ and Central Transmission Corridor. The area has therefore been identified as suitable for the establishment of the grid infrastructure.

### **5.2.5 Assessment of no-development option**

The No-Development option would represent a lost opportunity for South Africa to improve energy security and supplement its current energy needs with renewable energy. Given South Africa's current energy security challenges and its position as one of the highest per capita producer of carbon emissions in the world, this would represent a negative social cost.

## **5.3 CONCLUSIONS AND RECOMMENDATIONS**

### ***Conclusion***

The energy security benefits associated with the proposed Karreebosch WEF are dependent upon it being able to connect to the national grid via the establishment of grid connection infrastructure.

The findings of the SIA indicate that the significance of the potential negative social impacts for both the construction and operational phase of the proposed 132 kV Karreebosch overhead power line, substation and associated infrastructure are **Low Negative** with mitigation. The potential negative impacts can therefore be effectively mitigated if the recommended mitigation measures are implemented. The power line is also located within the Komsberg REDZ and Central Transmission Corridor. The establishment of proposed 132 kV Karreebosch overhead power line, 33/132kV Substation and associated infrastructure is therefore supported by the findings of the SIA.

All the Options were regarded as acceptable by the affected landowners except for the section of Alternative 2C located close to the headwaters of the Tankwa River on Ek Kraal 199/1 and traverses cropped areas on Ek Kraal 199/RE. The concerns are linked to potential impacts on the Tankwa River and productive farmland. The options associated with substation Option 1 (Powerline Options 1A-1C) are preferred to the options associated with substation Option 2 (Powerline Options 2A-2C). This is due to the shorter distances involved with Option 1.

### ***Recommendations***

Based on the findings of the SIA, Option 1A, the preferred Option, is supported.

## **ANNEXURE A**

### **INTERVIEWS**

- Calldo, Mr Douglas (telephonic 2017-09-16; 2017-09-20). Swartland farm.
- Conradie, Mr Francois (telephonic 2021-09-17). Standvastigheid 210/RE.
- Conradie, Mr Piet (telephonic 2017-09-16; 2017-09-21). Bonne Espirange farm.
- Conradie, Ms. Kobie (telephonic 2017-09-17). Klipbanksfontein 198/1.
- Le Roux, Mr. Kobus (telephonic 2017-09-17). Rietfontein 197/RE.
- Van der Merwe, Mr Piet (telephonic 2017-09-17). Manager (on behalf of Steenkamp Trust) Ekkraal 199/2.

### **REFERENCES**

- National Development Plan (2011).
- New Growth Path Framework (2010).
- National Infrastructure Plan (2012).
- Integrated Energy Plan (2019).
- Strategic Environmental Assessment (SEA) for wind and solar PV energy in South Africa (CSIR, 2015)
- The Western Cape Provincial Spatial Development Framework (2014).
- The Western Cape Infrastructure Framework (2013).
- Northern Cape Provincial Growth and Development Plan (NCPGDP)
- Karoo Hoogland Integrated Development Plan (IDP) (2017-2022).
- Karoo Hoogland Spatial Development Framework (SDF) (2015).
- Laingsburg Integrated Development Plan (IDP) (2017-2022).
- Laingsburg Spatial Development Framework (SDF) (2019).
- Laingsburg Local Economic Development Strategy (2019-2029).

## ANNEXURE B

### METHODOLOGY FOR THE ASSESSMENT OF POTENTIAL IMPACTS

#### Assessment of Impacts and Mitigation

The assessment of impacts and mitigation evaluates the likely extent and significance of the potential impacts on identified receptors and resources against defined assessment criteria, to develop and describe measures that will be taken to avoid, minimise or compensate for any adverse environmental impacts, to enhance positive impacts, and to report the significance of residual impacts that occur following mitigation.

The key objectives of the risk assessment methodology are to identify any additional potential environmental issues and associated impacts likely to arise from the proposed project, and to propose a significance ranking. Issues / aspects will be reviewed and ranked against a series of significance criteria to identify and record interactions between activities and aspects, and resources and receptors to provide a detailed discussion of impacts. The assessment considers direct<sup>26</sup>, indirect<sup>27</sup>, secondary<sup>28</sup> as well as cumulative<sup>29</sup> impacts.

A standard risk assessment methodology is used for the ranking of the identified environmental impacts pre-and post-mitigation (i.e. residual impact). The significance of environmental aspects is determined and ranked by considering the criteria<sup>30</sup> presented in **Table 0-1**.

**Table 0-1: Impact Assessment Criteria and Scoring System**

CRITERIA	SCORE 1	SCORE 2	SCORE 3	SCORE 4	SCORE 5
<b>Impact Magnitude (M)</b> The degree of alteration of the affected environmental receptor	Very low: No impact on processes	Low: Slight impact on processes	Medium: Processes continue but in a modified way	High: Processes temporarily cease	Very High: Permanent cessation of processes
<b>Impact Extent (E)</b> The geographical extent of the impact on a given environmental receptor	Site: Site only	Local: Inside activity area	Regional: Outside activity area	National: National scope or level	International: Across borders or boundaries
<b>Impact Reversibility (R)</b> The ability of the environmental receptor to rehabilitate or restore after the activity has caused environmental change	Reversible: Recovery without rehabilitation		Recoverable: Recovery with rehabilitation		Irreversible: Not possible despite action
<b>Impact Duration (D)</b> The length of permanence of the impact on the environmental receptor	Immediate: On impact	Short term: 0-5 years	Medium term: 5-15 years	Long term: Project life	Permanent: Indefinite

<sup>26</sup> Impacts that arise directly from activities that form an integral part of the Project.

<sup>27</sup> Impacts that arise indirectly from activities not explicitly forming part of the Project.

<sup>28</sup> Secondary or induced impacts caused by a change in the Project environment.

<sup>29</sup> Impacts are those impacts arising from the combination of multiple impacts from existing projects, the Project and/or future projects.

<sup>30</sup> The definitions given are for guidance only, and not all the definitions will apply to all the environmental receptors and resources being assessed. Impact significance was assessed with and without mitigation measures in place.

CRITERIA	SCORE 1	SCORE 2	SCORE 3	SCORE 4	SCORE 5
<b>Probability of Occurrence (P)</b> The likelihood of an impact occurring in the absence of pertinent environmental management measures or mitigation	Improbable	Low Probability	Probable	Highly Probability	Definite
<b>Significance (S)</b> is determined by combining the above criteria in the following formula:	$[S = (E + D + R + M) \times P]$ $Significance = (Extent + Duration + Reversibility + Magnitude) \times Probability$				
<b>IMPACT SIGNIFICANCE RATING</b>					
<b>Total Score</b>	0 – 30		31 to 60		61 – 100
<b>Environmental Significance Rating (Negative (-))</b>	Low (-)		Moderate (-)		High (-)
<b>Environmental Significance Rating (Positive (+))</b>	Low (+)		Moderate (+)		High (+)



## **ANNEXURE C**

10 Firs Avenue, Claremont, 7708, South Africa  
(Cell) 082 600 8266  
(E-Mail) [tony@tonybarbour.co.za](mailto:tony@tonybarbour.co.za)

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Tony Barbour's has 28 years' experience as an environmental consultant, including ten years as a consultant in the private sector followed by four years at the University of Cape Town's Environmental Evaluation Unit. He has worked as an independent consultant since 2004, with a key focus on Social Impact Assessment. His other areas of interest include Strategic Environmental Assessment and review work.

### **EDUCATION**

- BSc (Geology and Economics) Rhodes (1984);
- B Economics (Honours) Rhodes (1985);
- MSc (Environmental Science), University of Cape Town (1992)

### **EMPLOYMENT RECORD**

- Independent Consultant: November 2004 – current;
- University of Cape Town: August 1996-October 2004: Environmental Evaluation Unit (EEU), University of Cape Town. Senior Environmental Consultant and Researcher;
- Private sector: 1991-August 2000: 1991-1996: Ninham Shand Consulting (Now Aurecon, Cape Town). Senior Environmental Scientist; 1996-August 2000: Steffen, Robertson and Kirsten (SRK Consulting) – Associate Director, Manager Environmental Section, SRK Cape Town.

### **LECTURING**

- University of Cape Town: Resource Economics; SEA and EIA (1991-2004);
- University of Cape Town: Social Impact Assessment (2004-current);
- Cape Technikon: Resource Economics and Waste Management (1994-1998);
- Peninsula Technikon: Resource Economics and Waste Management (1996-1998).

### **RELEVANT EXPERIENCE AND EXPERTISE**

Tony Barbour has undertaken in the region of 260 SIA's, including SIA's for infrastructure projects, dams, pipelines, and roads. All of the SIAs include interacting with and liaising with affected communities. In addition, he is the author of the Guidelines for undertaking SIA's as part of the EIA process commissioned by the Western Cape Provincial Environmental Authorities in 2007. These guidelines have been used throughout South Africa.

Tony was also the project manager for a study commissioned in 2005 by the then South African Department of Water Affairs and Forestry for the development of a Social Assessment and Development Framework. The aim of the framework was to enable the Department of Water Affairs and Forestry to identify, assess and manage social impacts associated with large infrastructure projects, such as dams. The study also included the development of guidelines for Social Impact Assessment, Conflict Management, Relocation and Resettlement and Monitoring and Evaluation.

Countries with work experience include South Africa, Namibia, Angola, Botswana, Zambia, Lesotho, Swaziland, Ghana, Mozambique, Mauritius, Kenya, Ethiopia, Oman, South Sudan, Senegal, Sudan and Armenia.

## ANNEXURE D

The specialist declaration of independence in terms of the Regulations\_

I, Tony Barbour \_\_\_\_\_, declare that -- General

declaration:

I act as the independent specialist in this application;

I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;

I declare that there are no circumstances that may compromise my objectivity in performing such work;

I have expertise in conducting the specialist report relevant to this application, including knowledge of the Act, Regulations and any guidelines that have relevance to the proposed activity;

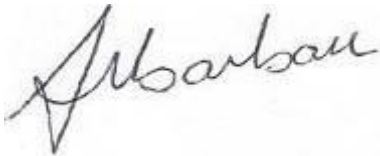
I will comply with the Act, Regulations and all other applicable legislation;

I have no, and will not engage in, conflicting interests in the undertaking of the activity;

I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing - any decision to be taken with respect to the application by the competent authority; and - the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;

all the particulars furnished by me in this form are true and correct; and

I realise that a false declaration is an offence in terms of regulation 48 and is punishable in terms of section 24F of the Act.



\_\_\_\_\_  
Signature of the specialist:

Tony Barbour Environmental Consulting and Research

\_\_\_\_\_  
Name of company (if applicable):

1 October 2022

\_\_\_\_\_  
Date: