

GRID CONNECTION INFRASTRUCTURE FOR THE HYPERION HYBRID FACILITY, NORTHERN CAPE PROVINCE

Basic Assessment Report
October 2020

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PROJECT DETAILS

Title	:	Establishment of 132kV Grid Connection Infrastructure for the Hyperion Hybrid Facility near Kathu, Northern Cape
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Client	:	Hyperion Solar Hybrid (Pty) Ltd
Report Revision	:	Draft for public review
Date	:	October 2020

When used as a reference this report should be cited as: Savannah Environmental (2020) Basic Assessment Report for the Establishment of Grid Connection Infrastructure at the Hyperion Hybrid Facility, near Kathu, Northern Cape Province.

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PURPOSE OF THE BASIC ASSESSMENT REPORT AND INVITATION TO COMMENT

Hyperion Solar Hybrid (Pty) Ltd has appointed Savannah Environmental as the independent environmental consultant to undertake the Basic Assessment (BA) for the grid infrastructure for the Hyperion Hybrid Facility, Northern Cape. The project development site is located within the Northern corridor of the Strategic Transmission Corridors. The BA process is being undertaken in accordance with the requirements of the 2014 EIA Regulations promulgated in terms of the National Environmental Management Act (NEMA; Act No. 107 of 1998).

This Basic Assessment (BA) report has been compiled in accordance with Appendix 1 of the EIA Regulations, 2014 (as amended) and consists of the following sections:

This BA Report describes and assesses this proposed project and consists of the following chapters:

- » **Chapter 1** provides background to the proposed 132kV grid infrastructure and the BA process.
- » **Chapter 2** outlines strategic regulatory and legal context for energy planning in South Africa and specifically for the proposed project.
- » **Chapter 3** provides a description of Scope of the proposed project, including identified project alternatives, and the need and desirability of the project
- » **Chapter 4** outlines the approach to undertaking the BA process.
- » **Chapter 5** describes the existing biophysical and social environment within and surrounding the broader study and development area.
- » **Chapter 6** provides an assessment of the potential issues and impacts associated with the various infrastructure developments and presents recommendations for the mitigation of significant impacts.
- » **Chapter 7** provides an assessment of the potential cumulative impacts.
- » **Chapter 8** presents the conclusions and recommendations based on the findings of the BA Report.
- » **Chapter 9** provides references used in the compilation of the BA Report.

The BA report is available for review from **Tuesday, 27th of October until Thursday, 26th of November 2020** at the following locations:

- » <https://www.savannahsa.com/public-documents/grid-infrastructure/>.

Please submit your comments by Thursday, 26th of November 2020 to:
Nicolene Venter PO Box 148, Sunninghill, 2157 Tel: 011-656-3237 Fax: 086-684-0547 Email: publicprocess@savannahsa.com

Comments can be made as written submission via fax, post or email.

EXECUTIVE SUMMARY

Hyperion Solar Hybrid (Pty) Ltd proposes the construction and operation of a 132kV power line for the Hyperion Hybrid Facility, near Kathu, Northern Cape Province. The proposed project will include the development of a 132kV overhead power line to connect to the national grid, via the existing Kalbas substation.

A corridor of 300m and 8km long was assessed within this BA process to allow for the optimisation of the grid connection infrastructure layout and to accommodate environmental sensitivities. The proposed Hyperion-Kalbas 132kV power line will be developed within this assessed grid connection corridor.

The full length of the assessed 300m corridor traverses 3 affected properties, namely:

- » Remainder of the Farm Lyndoch 432
- » Portion 1 of the Farm Selsden 464
- » Remainder of the Farm Kathu 465

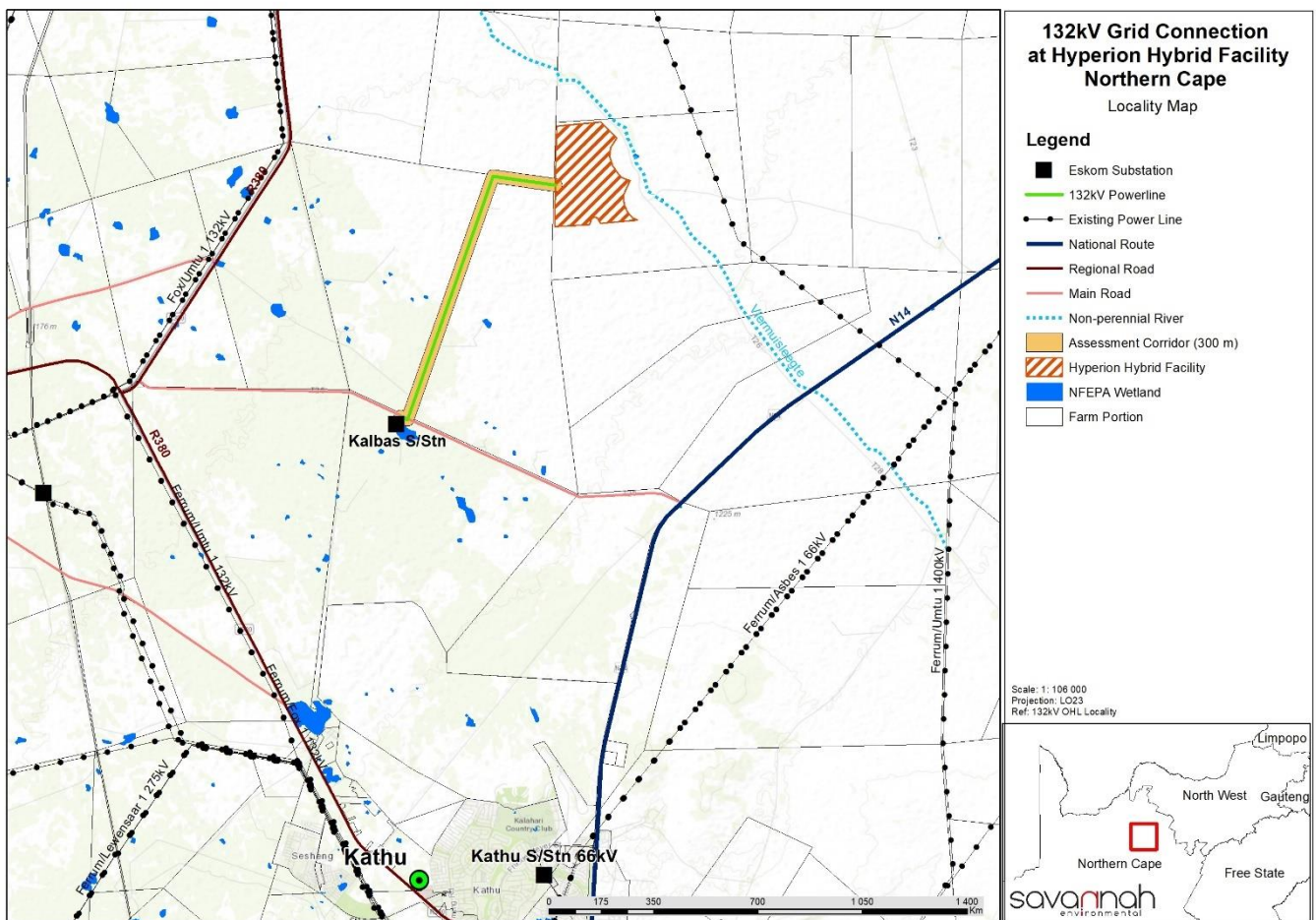


Figure 1: Locality map showing Hyperion-Kalbas 132kV power line.

No environmental fatal flaws were identified in the detailed specialist studies conducted for the Hyperion-Kalbas 132kV power line. All impacts associated with the project establishment within the power line corridor can be mitigated to acceptable levels or enhanced through the implementation of the recommended mitigation or enhancement measures.

The potential environmental impacts associated with the Hyperion-Kalbas 132kV power line identified and assessed through the BA process include:

Ecological Impacts - The impacts of the proposed Hyperion-Kalbas 132kV power line on the floral and faunal habitat, diversity and species of concern (SCC) are considered to range from medium-low to low significance impacts prior to the implementation of mitigation measures. With mitigation fully implemented all impacts can be reduced to low and very low significance impacts. No significant impacts on the biodiversity associated with the focus area are anticipated for the proposed development (**Appendix D**). Considering the findings of the study and potential for mitigation, it is the reasoned opinion of the specialist that the Hyperion-Kalbas 132kV power line can be authorised from an ecological perspective.

Avifauna Impacts – The major impact anticipated to occur as a result of the Hyperion-Kalbas 132kV power line are collisions and electrocutions during the operation of the power line. It is anticipated that, should the proposed mitigation measures be implemented, the risk of collisions and electrocutions can be drastically reduced. Although several SCC are known to inhabit the area, no known nesting or roosting sites were observed in the focus area and impacts to the priority species are not anticipated to be significant. From an avifaunal ecological perspective, the proposed development can be considered favourable (**Appendix E**). Considering the findings of the study and potential for mitigation, it is the reasoned opinion of the specialist that the Hyperion-Kalbas 132kV power line can be authorised from an avifaunal perspective.

Aquatic Impacts – The proposed Hyperion-Kalbas 132kV power line was determined to pose a Low impact significance to the cryptic wetlands identified within the study area. Due to these infrastructure components located outside of the delineated boundary of the cryptic wetlands and 32m NEMA Zone of Regulation (ZoR), no direct impacts from the construction of the power line and related infrastructure are expected to occur. Nevertheless, the potential occurrence of impacts associated with edge effects on the watercourses must be considered. If these edge effects are managed accordingly the impact significance on the wetlands is expected to remain low (**Appendix G**). Considering the findings of the study and potential for mitigation, it is the reasoned opinion of the specialist that the Hyperion-Kalbas 132kV power line can be authorised from an aquatic resources perspective.

Soils, Agriculture and Land potential Impacts – The Soils & Agricultural Compliance Statement (**Appendix H** of the BA Report) identified the soils in the project area to be of low agricultural potential, and that most of the impacts are anticipated to occur during the construction phase of the proposed development. Impacts identified from a soil, agricultural and land potential include a reduction of land with natural vegetation for livestock grazing and susceptibility to soil erosion. The anticipated impact is associated with a short-term duration, given the short duration of the construction phase (i.e. 10-12 months), and are associated with moderate magnitude. The anticipated impacts are associated with a low significance following the implementation of the recommended mitigation measures. Considering the findings of the study and potential for mitigation, it is the reasoned opinion of the specialist that the Hyperion-Kalbas 132kV power line can be authorised from a soil, agricultural and land potential perspective.

Impacts on Heritage Resources (including archaeology and palaeontology)– It is expected that impacts to heritage and palaeontological resources will occur during the construction phase due to the potential to intersect archaeological resources during excavation of the pylon foundations. However, with appropriate mitigation, the impacts can be easily managed, and a scientific benefit could even be derived with successful description and rescue of heritage materials. No impacts are expected during the operation phase of the project.

The impacts of the proposed development on archaeological and palaeontological resources is therefore of low to moderate significance, with a long-term duration and a low magnitude following the implementation of the recommended mitigation measures. Therefore, the development of the Hyperion-Kalbas 132kV power line will not have a significant negative impact on the archaeological and palaeontological resources identified within the grid connection corridor. As such, the development of the power line is not associated with any fatal flaws from a heritage, archaeological and palaeontological perspective, and it is considered to be acceptable (**Appendix F**). Considering the findings of the study and potential for mitigation, it is the reasoned opinion of the specialist that the Hyperion-Kalbas 132kV power line can be authorised from a heritage perspective.

Visual Impacts - The Visual Impact Assessment (**Appendix I**) identified negative impacts on visual receptors during the construction (including decommissioning) and the operation phases of the Hyperion-Kalbas 132kV power line. The impacts include an impact on the general landscape character; the visibility of the proposed power line to and a visual impact on rural homesteads; the visibility of the proposed power line to and visual impact on the T25. Due to the nature of the infrastructure and the surrounding area, impacts are expected to be limited to within 3km of the development.

The duration of the impacts in the operation phase is expected to be long-term, with a magnitude ranging from moderate to low. The significance of the impacts will be low with the implementation of mitigation measures. No impacts of a high or medium significance are expected to occur. The development of the Hyperion-Kalbas 132kV power line is therefore considered to be acceptable from a visual perspective (**Appendix I**). Considering the findings of the study and potential for mitigation, it is the reasoned opinion of the specialist that the Hyperion-Kalbas 132kV power line can be authorised from a visual perspective

Social Impacts – The Social Impact Assessment (**Appendix J**) identified that the majority of the negative and positive social impacts associated with the project are anticipated to occur during the construction phase. The anticipated duration for the construction phase of the project is approximately 10-12 months, following which the power line will be handed over to Eskom for the duration of the operation phase, which is anticipated to be 20 years. These impacts include the creation of direct and indirect employment opportunities; economic multiplier effects; an influx of jobseekers and a change in the population; safety and security impacts; impacts on the daily living and movement patterns; nuisance impacts; and a sense of place impacts. These impacts will have a short-term duration and a small to moderate magnitude.

For the operation phase of the power line, the impacts identified include direct and indirect employment opportunities; visual impacts and a sense of place impacts; and impacts associated with the loss of agricultural land. These impacts are associated with a long-term duration and a minor to low magnitude and will be of a low significance following the implementation of the recommended enhancement measures.

The development of the Hyperion-Kalbas 132kV power line is unlikely to result in permanent damaging social impacts. From a social perspective, it is concluded that the project is acceptable subject to the implementation of the recommended mitigation and enhancement measures and management actions identified for the project. Considering the findings of the study and potential for mitigation, it is the reasoned opinion of the specialist that the Hyperion-Kalbas 132kV power line can be authorised from a social perspective.

Cumulative Impacts - Cumulative impacts and benefits on various environmental and social receptors will occur to varying degrees with the development of grid connection infrastructure in South Africa and within the surrounding area of the grid connection corridor. The surrounding area is associated with large scale ongoing iron ore mining operations, which have contributed to the transformation and industrialisation of the landscape in the area. The grid connection corridor for the Hyperion-Kalbas 132kV power line is located within an area where several grid connection developments are proposed and existing. Existing grid connection infrastructure within the vicinity of the grid connection corridor for the Hyperion-Kalbas 132kV power line include the Ferrum/Umtu 1 400kV, Ferrum/Umtu 1 132kV, Ferrum/Fox 1 132kV, Ferrum/Asbes 1 666kV, Ferrum/Nieuwehoop 1 400kV, Mookodi/Ferrum 1 400kV, Olien/Ferrum 1 275kV, and Kathu CSP power lines.

Based on the specialist cumulative assessments and findings regarding the development of the Hyperion-Kalbas 132kV power line (refer to **Chapter 7** and specialist reports contained within **Appendix D - J**) and its contribution to the overall impact within the surrounding area, it can be concluded that there are no cumulative impacts or risks identified as unacceptable with the development of the Hyperion-Kalbas 132kV power line and other grid connection infrastructure within the surrounding area. In addition, no impacts that will result in whole-scale change are expected as a result of the Hyperion-Kalbas 132kV power line. Considering all aspects, cumulative impacts associated with the Hyperion-Kalbas 132kV power line have been assessed to be acceptable, with no unacceptable loss or risk expected.

Figure 2 provides an environmental sensitivity map of the grid connection corridor assessed as part of the BA process.

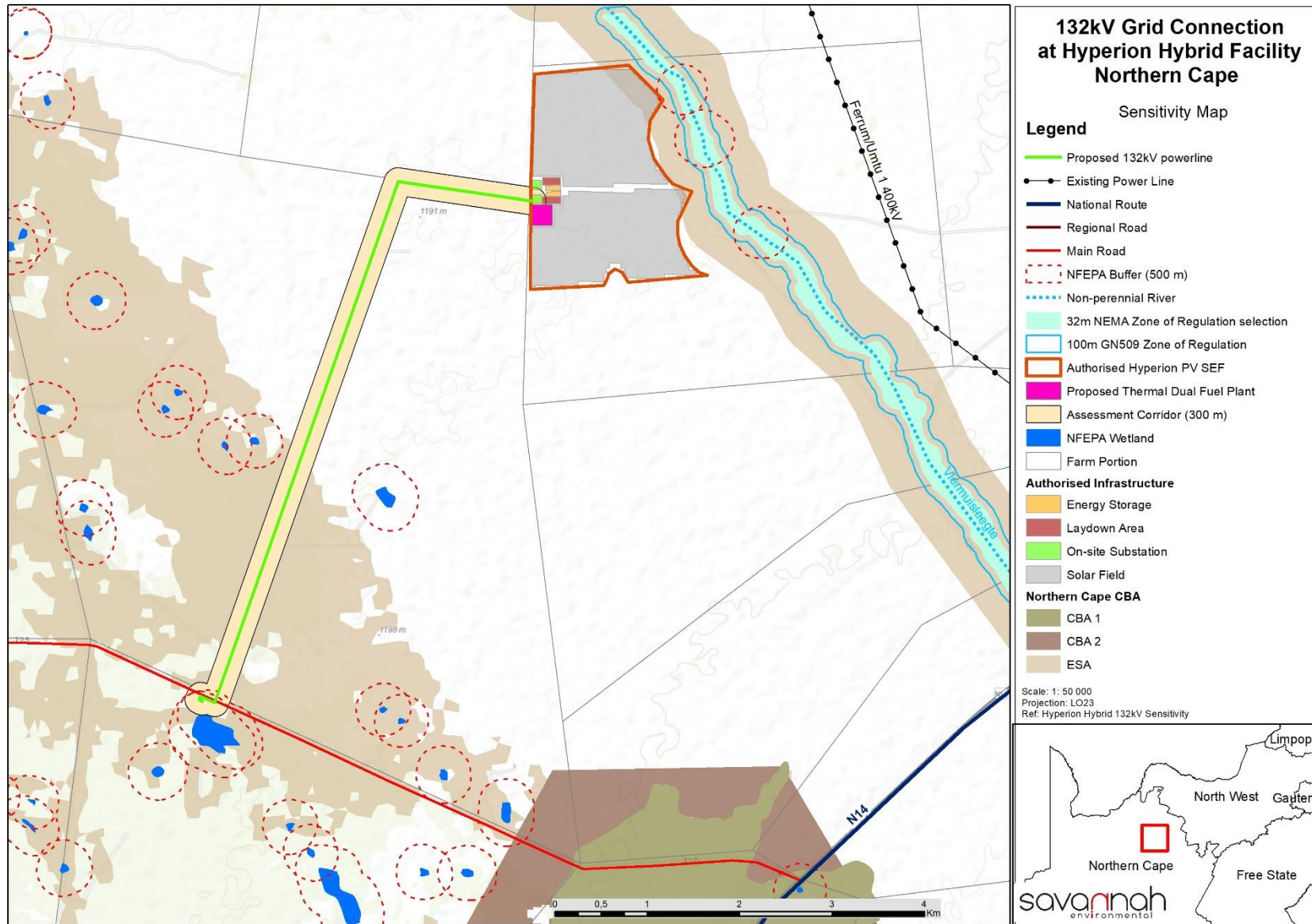


Figure 2: Environmental sensitivity map for the proposed Hyperion-Kalbas 132kV power line

DEFINITIONS AND TERMINOLOGY

Alternatives: Alternatives are different means of meeting the general purpose and need of a proposed activity. Alternatives may include location or site alternatives, activity alternatives, process or technology alternatives, temporal alternatives or the 'do nothing' alternative.

Commence: The start of any physical activity, including site preparation and any other activity on site furtherance of a listed activity or specified activity, but does not include any activity required for the purposes of an investigation or feasibility study as long as such investigation or feasibility study does not constitute a listed activity or specified activity.

Commissioning: Commissioning commences once construction is completed. Commissioning covers all activities including testing after all components of the wind turbine are installed.

Construction: Construction means the building, erection or establishment of a facility, structure or infrastructure that is necessary for the undertaking of a listed or specified activity. Construction begins with any activity which requires Environmental Authorisation.

Cumulative impacts: Impacts that result from the incremental impact of the proposed activity on a common resource when added to the impacts of other past, present or reasonably foreseeable future activities (e.g. discharges of nutrients and heated water to a river that combine to cause algal bloom and subsequent loss of dissolved oxygen that is greater than the additive impacts of each pollutant). Cumulative impacts can occur from the collective impacts of individual minor actions over a period and can include both direct and indirect impacts.

Decommissioning: To take out of active service permanently or dismantle partly or wholly, or closure of a facility to the extent that it cannot be readily re-commissioned. This usually occurs at the end of the life of a facility.

Direct impacts: Impacts that are caused directly by the activity and generally occur at the same time and at the place of the activity (e.g. noise generated by blasting operations on the site of the activity). These impacts are usually associated with the construction, operation, or maintenance of an activity and are generally obvious and quantifiable.

'Do nothing' alternative: The 'do nothing' alternative is the option of not undertaking the proposed activity or any of its alternatives. The 'do nothing' alternative also provides the baseline against which the impacts of other alternatives should be compared.

Endangered species: Taxa in danger of extinction and whose survival is unlikely if the causal factors continue operating. Included here are taxa whose numbers of individuals have been reduced to a critical level or whose habitats have been so drastically reduced that they are deemed to be in immediate danger of extinction.

Emergency: An undesired/ unplanned event that results in a significant environmental impact and requires the notification of the relevant statutory body, such as a local authority.

Endemic: An "endemic" is a species that grows in a particular area (is endemic to that region) and has a restricted distribution. It is only found in a particular place. Whether something is endemic or not depends on the geographical boundaries of the area in question and the area can be defined at different scales.

Environment: the surroundings within which humans exist and that are made up of:

- i. The land, water and atmosphere of the earth;
- ii. Micro-organisms, plant and animal life;
- iii. Any part or combination of (i) and (ii) and the interrelationships among and between them; and
- iv. The physical, chemical, aesthetic and cultural properties and conditions of the foregoing that influence human health and well-being.

Environmental impact: An action or series of actions that have an effect on the environment.

Environmental management: Ensuring that environmental concerns are included in all stages of development, so that development is sustainable and does not exceed the carrying capacity of the environment.

Environmental management programme: An operational plan that organises and co-ordinates mitigation, rehabilitation and monitoring measures in order to guide the implementation of a proposal and its ongoing maintenance after implementation.

Heritage: That which is inherited and forms part of the National Estate (Historical places, objects, fossils as defined by the National Heritage Resources Act of 2000).

Indigenous: All biological organisms that occurred naturally within the study area prior to 1800.

Indirect impacts: Indirect or induced changes that may occur because of the activity (e.g. the reduction of water in a stream that supply water to a reservoir that supply water to the activity). These types of impacts include all the potential impacts that do not manifest immediately when the activity is undertaken or which occur at a different place because of the activity.

Interested and affected party: Individuals or groups concerned with or affected by an activity and its consequences. These include the authorities, local communities, investors, work force, consumers, environmental interest groups, and the public.

Method statement: A written submission to the ECO and the site manager (or engineer) by the EPC Contractor in collaboration with his/her EO.

Mitigation hierarchy: The mitigation hierarchy is a framework for managing risks and potential impacts related to biodiversity and ecosystem services. The mitigation hierarchy is used when planning and implementing development projects, to provide a logical and effective approach to protecting and conserving biodiversity and maintaining important ecosystem services. It is a tool to aid in the sustainable management of living, natural resources, which provides a mechanism for making explicit decisions that balance conservation needs with development priorities

No-go areas: Areas of environmental sensitivity that should not be impacted on or utilised during the development of a project as identified in any environmental reports.

Pollution: A change in the environment caused by substances (radio-active or other waves, noise, odours, dust or heat emitted from any activity, including the storage or treatment or waste or substances).

Pre-construction: The period prior to the commencement of construction, this may include activities which do not require Environmental Authorisation (e.g. geotechnical surveys).

Rare species: Taxa with small world populations that are not at present Endangered or Vulnerable, but are at risk as some unexpected threat could easily cause a critical decline. These taxa are usually localised within restricted geographical areas or habitats or are thinly scattered over a more extensive range. This category was termed Critically Rare by Hall and Veldhuis (1985) to distinguish it from the more generally used word "rare."

Red data species: Species listed in terms of the International Union for Conservation of Nature and Natural Resources (IUCN) Red List of Threatened Species, and/or in terms of the South African Red Data list. In terms of the South African Red Data list, species are classified as being extinct, endangered, vulnerable, rare, indeterminate, insufficiently known or not threatened (see other definitions within this glossary).

Significant impact: An impact that by its magnitude, duration, intensity, or probability of occurrence may have a notable effect on one or more aspects of the environment.

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CHAPTER 1: INTRODUCTION

Hyperion Solar Hybrid (Pty) Ltd, a developer in South Africa, proposes the development of a 132kV overhead power line to connect the proposed Hyperion Hybrid Power Facility (comprising the authorised Hyperion 1 & 2 PVSEFs and the proposed Thermal Facility¹) to the national grid via the existing Eskom Kalbas substation. The power line is referred to hereafter as the Hyperion-Kalbas 132kV power line and is proposed approximately 15km north of the town of Kathu in the Gamagara Local Municipality, Northern Cape Province (refer to **Figure 1.1** and **Table 1.1**).

Table 1.1: Location of proposed infrastructure

Province	Northern Cape Province
District Municipality	John Taolo Gaetsewe District Municipality
Local Municipality	Gamgara Local Municipality
Ward number(s)	Ward 7
Nearest town(s)	Kathu, Deben, Kuruman
Affected Properties: Farm name(s), number(s) and portion numbers	<ul style="list-style-type: none"> » RE of Farm Lyndoch 432 » Portion 1 of the Farm Selsden 464 » RE of Farm Kathu 465
SG 21 Digit Code (s): Affected Properties	<ul style="list-style-type: none"> » C0410000000043200000 » C0410000000046400001 » C0410000000046500000

The Hyperion Hybrid Facility is being proposed in response to the procurement process initiated by the Independent Power Producer Office (IPP Office) for the procurement of up to 2000MW of dispatchable generation capacity from a range of technologies. The 132kV power line is required to connect this facility to the national grid.

The proposed grid connection infrastructure is approximately 8km long and includes an assessment corridor of 300m. This BA Report describes and assesses this proposed project and consists of the following chapters:

- » **Chapter 1** provides background to the proposed 132kV grid infrastructure and the BA process.
- » **Chapter 2** outlines strategic regulatory and legal context for energy planning in South Africa and specifically for the proposed project.
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- » **Chapter 9** provides references used in the compilation of the BA Report.

¹ A separate Scoping and EIA process is being undertaken for the Thermal Facility; hence it has not been assessed as part of this basic assessment

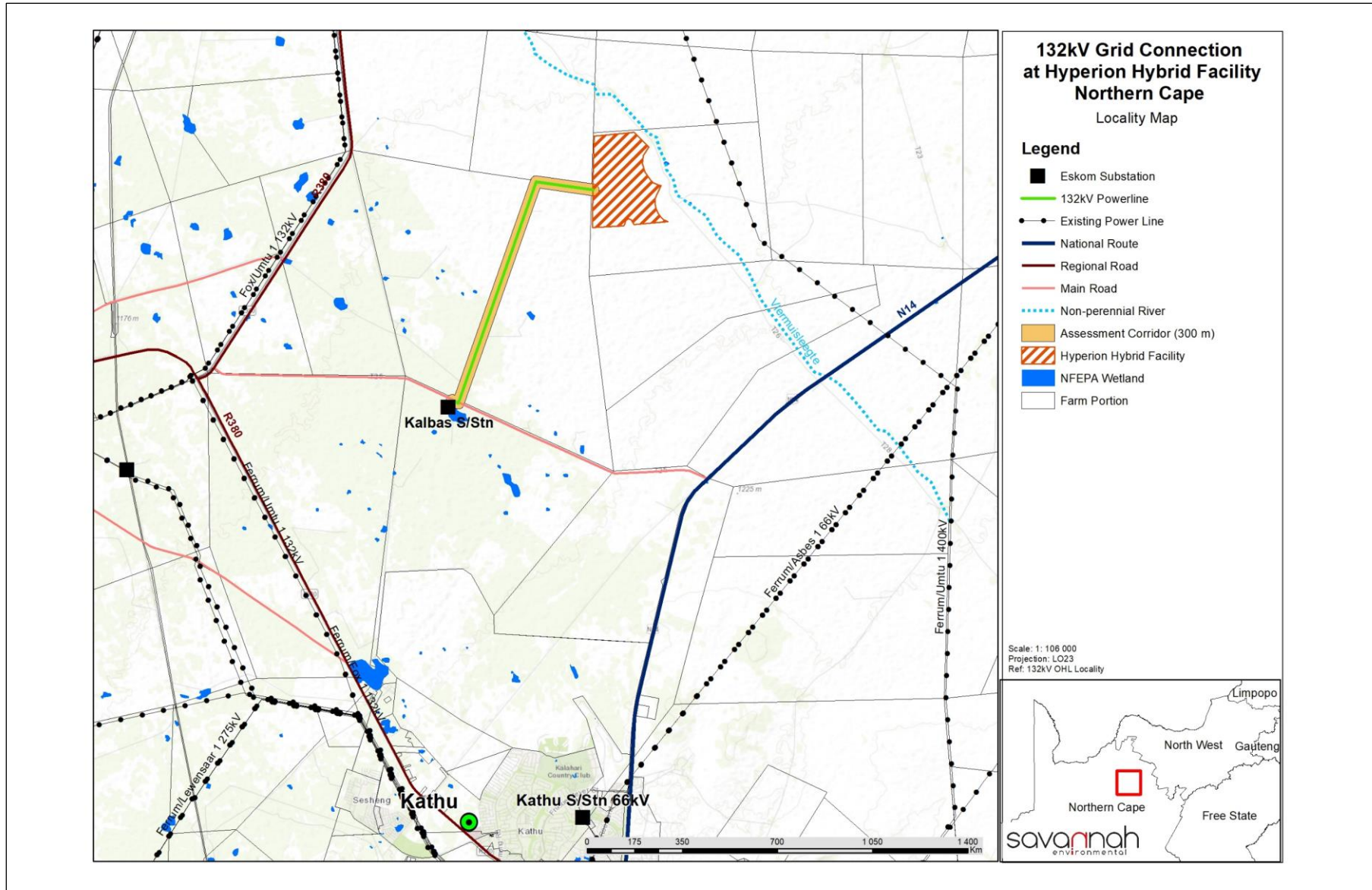


Figure 1.1: Locality map illustrating the Hyperion Hybrid Facility and proposed the 132kV power line corridor

1.1 Legal Requirements as per the EIA Regulations, 2014 (as amended), for the undertaking of a Basic Assessment Report

This BA Report has been prepared in accordance with the requirements of the EIA Regulations published on 08 December 2014 (as amended) promulgated in terms of Chapter 5 of the National Environmental Management Act (No. 107 of 1998). This Chapter of the BA Report includes the following information required in terms of Appendix 1: Content of Basic Assessment Reports:

Requirement	Relevant Section
1(a) the details of the EAP who prepared the report and (ii) the expertise of the EAP, including a curriculum vitae.	The details and expertise of the EAP who prepared the report is included in section 1.4 and CVs of the project team are included in Appendix A.
(b) the location of the activity including (i) the 21 digit Surveyor General code of each cadastral land parcel, (ii) where available the physical address and farm name and (iii) where the required information in items (i) and (ii) is not available, the co-ordinates of the boundary of the property or properties.	A description of the location of the 132kV power line is included in Table 1.1 and Figure 1.1 . The information provided includes the 21-digit Surveyor General Code of the affected property and the farm name. Information on the relevant province, local and district municipalities, ward and current land zoning is also provided.

1.2 Details and Expertise of the Environmental Assessment Practitioner (EAP)

In accordance with Regulation 12 of the 2014 EIA Regulations (GN R326), Hyperion Solar Hybrid (Pty) Ltd has appointed Savannah Environmental (Pty) Ltd (Savannah Environmental) as the independent environmental consultant to undertake the Basic Assessment and prepare the BA Report for the development of the Hyperion-Kalbas 132kV power line. Neither Savannah Environmental nor any of its specialists are subsidiaries of/or are affiliated to Hyperion Solar Hybrid (Pty) Ltd. Furthermore, Savannah Environmental does not have any interests in secondary developments that may arise out of the authorisation of the proposed infrastructure.

Savannah Environmental is a leading provider of integrated environmental and social consulting, advisory and management services with considerable experience in the fields of environmental assessment and management. The company is wholly woman-owned (51% black woman-owned) and is rated as a Level 2 Broad-Based Black Economic Empowerment (B-BBEE) Contributor. The company was established in 2006 with a clear objective to provide services to the infrastructure development sector. Savannah Environmental benefits from the pooled resources, diverse skills and experience in the environmental field held by its team that has been actively involved in undertaking environmental studies for a wide variety of projects throughout South Africa and neighbouring countries. Strong competencies have been developed in project management of environmental processes, as well as strategic environmental assessment and compliance advice, and the assessment of environmental impacts, the identification of environmental management solutions and mitigation/risk minimising measures.

The Savannah Environmental team has considerable experience in environmental impact assessments and environmental management and has been actively involved in undertaking environmental studies for a wide variety of projects throughout South Africa, including those associated with electricity generation and transmission.

The Savannah Environmental team comprises:

- » **Arlene Singh.** She holds a Bachelor Degree in Environmental Science and an Honours degree in Environmental Management and has seven years of experience in the environmental management field. Her key focus is on undertaking environmental impact assessments, public participation, environmental management plans and programmes. She is registered as a Candidate Natural Scientist with the South African Council for Natural Scientific Professions (SACNASP) and an Environmental Assessment Practitioner (EAP) with the Environmental Assessment Practitioners Association of South Africa (EAPASA).

- » **Jana de Jager.** She holds a Bachelor Degree in Environmental Science, an Honours degree in Geography & Environmental Science and is currently undertaking her M.S.c in Ecological Water Requirements. She has 2.5 years of experience in the environmental management field. Her key focus is on undertaking environmental impact assessments, GIS mapping, public participation, environmental management plans and programmes. She is registered as a Candidate Natural Scientist with the South African Council for Natural Scientific Professions (SACNASP).

- » **Jo-Anne Thomas.** She holds a Master of Science Degree in Botany (M.S.c Botany) from the University of the Witwatersrand and is registered as a Professional Natural Scientist (400024/2000) with the South African Council for Natural Scientific Professions (SACNASP) and a registered Environmental Assessment Practitioner (EAP) with the Environmental Assessment Practitioners Association of South Africa (EAPASA) (2019/726). She has over 20 years of experience in the field of environmental assessment and management, and the management of large environmental assessment and management projects. During this time, she has managed and coordinated a multitude of large-scale infrastructure EIAs and is also well versed in the management and leadership of teams of specialist consultants, and dynamic stakeholders. She has been responsible for providing technical input for projects in the environmental management field, specialising in Strategic Environmental Advice, EIA studies, environmental permitting, public participation, EMPs and EMPs, environmental policy, strategy and guideline formulation, and integrated environmental management (IEM). Her responsibilities for environmental studies include project management, review and integration of specialist studies, identification and assessment of potential negative environmental impacts and benefits, and the identification of mitigation measures, and compilation of reports in accordance with applicable environmental legislation.

- » **Nicolene Venter.** She is a Board Member of IAPSA (International Association for Public Participation South Africa). She holds a Higher Secretarial Diploma and has over 21 years of experience in public participation, stakeholder engagement, awareness creation processes and facilitation of various meetings (focus group, public meetings, workshops, etc.). She is responsible for project management of public participation processes for a wide range of environmental projects across South Africa and neighbouring countries.

Curricula Vitae (CVs) detailing Savannah Environmental team's expertise and relevant experience are provided in **Appendix A**.

CHAPTER 2: REGULATORY AND PLANNING CONTEXT

This Chapter provides an overview of the policy and legislative context within which the development of the Hyperion-Kalbas 132kV power line is proposed. It identifies environmental legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks and instruments that are applicable to this activity and are to be considered in the assessment process which may be applicable to or have bearing on the proposed project.

2.1. Legal Requirements as per the EIA Regulations, 2014 (as amended), for the undertaking of a Basic Assessment Report

This chapter of the BA Report includes the following information required in terms of Appendix 1: Content of Basic Assessment Reports:

Requirement	Relevant Section
(e) a description of the policy and legislative context within which the development is proposed including- (i) an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks, and instruments that are applicable to this activity and have been considered in the preparation of the report. (ii) how the proposed activity complies with and responds to the legislation and policy context, plans, guidelines, tools frameworks, and instruments.	A description of the policy and legislative context within which development of the 132kV power line infrastructure is proposed is included in section 2.3, 2.4 and 2.5.

The regulatory hierarchy of policy and planning documentation that supports the development of a project of this nature consists of three tiers of authority who exercise control through both statutory and non-statutory instruments – that is National, Provincial and Local levels (**Figure 2.1**). These policies are discussed in more detail in the following sections, along with the provincial and local policies or plans that have relevance to the proposed power line.

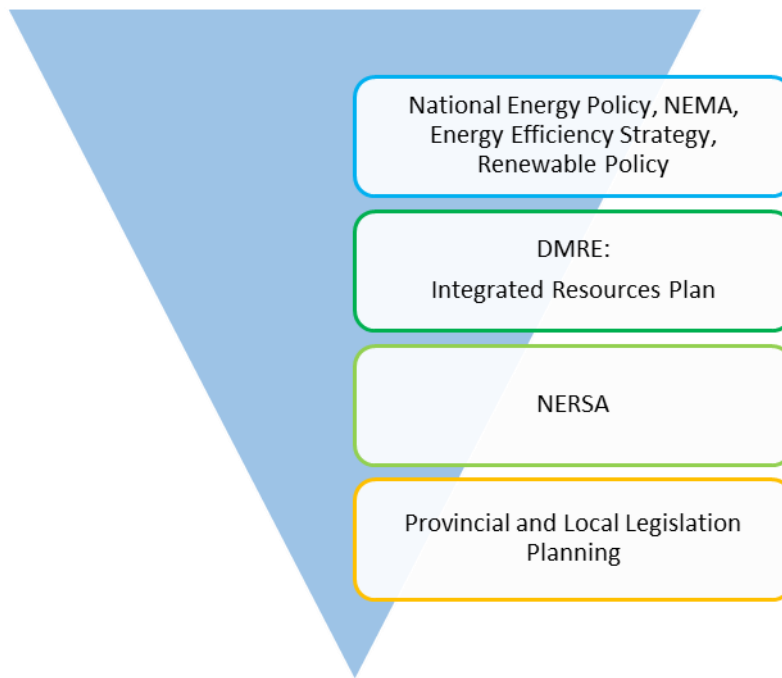


Figure 2.1: Hierarchy of electricity and planning documents

At **National Level**, the main regulatory agencies are:

- » **Department of Environment, Forestry and Fisheries (DEFF):** This Department is responsible for environmental policy and is the controlling authority in terms of NEMA and the 2014 EIA Regulations (GN R326) as amended. DEFF is the competent authority for this project (as per GNR 779 of 01 July 2016 and is charged with granting the EA for the project under consideration. Furthermore, the Department is also responsible for issuing permits for the disturbance or destruction of protected tree species listed under Section 15 (1) of the National Forest Act (No. 84 of 1998) (NFA).
- » **South African Heritage Resources Agency (SAHRA):** SAHRA is a statutory organisation established under the National Heritage Resources Act (No. 25 of 1999) (NHRA), as the national administrative body responsible for the protection of South Africa's cultural heritage.
- » **Department of Human Settlements, Water and Sanitation (DHSWS):** This Department is responsible for effective and efficient water resources management to ensure sustainable economic and social development. This Department is also responsible for evaluating and issuing licenses pertaining to water use (i.e. Water Use Licenses (WUL) and General Authorisation), where these may be applicable.
- » **Department of Mineral Resources and Energy (DMRE):** This Department is responsible for granting approvals for the use of land which is contrary to the objectives of the Mineral and Petroleum Resource Development Act (No. 28 of 2002) (MPRDA) in terms of Section 53 of the MPRDA. Therefore, in terms of the Act, approval from the Minister is required to ensure that the proposed activities do not sterilise mineral resource that may occur within the broader study area and development area.
- » **The Department of Agriculture, Rural Development and Land Reform (DARDLD):** This Department is the custodian of South Africa's agricultural resources and is responsible for the formulation and implementation of policies governing the agriculture sector and the initiation, facilitation, coordination and implementation of integrated rural development programmes.
- » **National Energy Regulator of South Africa (NERSA):** This body is responsible for regulating all aspects of the electricity sector and will ultimately issue licenses for IPP projects to generate electricity.

At **Provincial Level**, the main regulatory agencies are:

- » **Department of Agriculture, Environmental Affairs, Rural Development and Land Reform:** This Department is a Commenting Authority for the project and is also responsible for issuing any biodiversity and conservation-related permits. The Department's involvement in environmental management relates specifically to sustainable resource management, conservation of protected species and land care.
- » **Northern Cape Department of Roads and Public Works (NCDRPW):** NCDRPW is responsible for roads and the granting of exemption permits for the conveyance of abnormal loads on public roads.
- » **Ngwao Boswa Kapa Bokone (NBKB):** NBKB, the Northern Cape Provincial Heritage Resources Authority is responsible for the identification, conservation and management of heritage resources, as well as commenting on heritage related issues within the Province.
- » **Northern Cape Department of Transport, Safety and Liaison:** This Department provides effective co-ordination of crime prevention initiatives, provincial police oversight, traffic management and road safety towards a more secure environment.

At the **Local Level** the local and municipal authorities are the principal regulatory authorities responsible for planning, land use and the environment. In the Northern Cape, both the local and district municipalities play a role. The local municipality traversed by the power line corridor is the Gamagara Local Municipality, which forms part of the John Taolo Gaetsewe District Municipality. In terms of the Municipal Systems Act (Act No 32 of 2000) it is compulsory for all municipalities to go through an Integrated Development Planning (IDP) process to prepare a five-year strategic development plan for the area under their governance.

The relevant legislation and policies listed and discussed below are relevant to the Hyperion-Kalbas 132kV power line project and the Hyperion Hybrid Facility. This is due to the fact that the proposed power line infrastructure is directly linked to the operation of the Hyperion Hybrid Facility. Neither the Hyperion Hybrid facility or the power line infrastructure can operate on its own and require the other to be developed in order to fulfil the need for the development in its entirety.

2.2. National Policy

2.2.1. The National Energy Act (No. 34 of 2008)

The purpose of the National Energy Act (No. 34 of 2008) One of the objectives of the Act is to promote the diversity of the supply of energy and its sources. In this regard, the preamble makes direct reference to renewable resources and states that provision must be made for increased generation. The Act provides the legal framework which supports the development of power generation facilities, such as the Hyperion Hybrid facility and the proposed power line infrastructure.

2.2.2. White Paper on the Energy Policy of South Africa, 1998

The South African Energy Policy of 1998 identifies five key objectives, namely increasing access to affordable energy services, improving energy sector governance, stimulating economic development, managing energy related environmental impacts and securing supply through diversity. In order to meet these objectives South Africa needs to optimally use available energy resources. The development of the 132kV power line for the Hyperion Hybrid facility will enable the contribution, albeit only to a limited extent, to the achievement of the five objectives of the Energy Policy of the country.

2.2.3. The Electricity Regulation Act (No. 04 of 2006) (ERA)

The Electricity Regulation Act (No. 04 of 2006) as amended by the Electricity Regulation Act (No. 28 of 2007), replaced the Electricity Act (No. 41 of 1987), as amended, with the exception of Section 5B, which provides funds for the energy regulator for the purpose of regulating the electricity industry.

The ERA establishes a national regulatory framework for the electricity supply industry and made NERSA custodian and enforcer of the National Electricity Regulatory Framework. The ERA also provides for licences and registration as the manner in which the generation, transmission, distribution, reticulation, trading, and import and export of electricity is regulated.

2.2.4. The National Development Plan (NDP) 2030

The National Development Plan (NDP) 2030 offers a long-term plan for the country. It defines desired destinations where inequality and unemployment are reduced, and poverty is eliminated so that all South Africans can attain a decent standard of living. Electricity is one of the core elements of a decent standard of living.

While the achievement of the objectives of the NDP requires progress on a broad front, three priorities stand out, namely:

- » Raising employment through faster economic growth
- » Improving the quality of education, skills development and innovation
- » Building the capability of the state to play a developmental, transformative role

In terms of the Energy Sector's role in empowering South Africa, the NDP 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.
- » Social equity through expanded access to energy at affordable tariffs and through targeted, sustainable subsidies for needy households.
- » Environmental sustainability through efforts to reduce pollution and mitigate the effects of climate change.

In formulating its vision for the energy sector, the NDP took the IRP 2010 as its point of departure. Therefore, although electricity generation from coal is still seen as part of the energy mix within the NDP, the plan sets out steps that aim to ensure that, by 2030, South Africa's energy system looks very different to the current situation: coal will contribute proportionately less to primary-energy needs, while gas and renewable energy resources – especially wind, solar, imported hydroelectricity and other technology– will play a much larger role.

2.2.5. Integrated Energy Plan (IEP), November 2016

The purpose and objectives of the Integrated Energy Plan (IEP) are derived from the National Energy Act (No. 34 of 2008). The IEP takes into consideration the crucial role that energy plays in the entire economy of

the country and is informed by the output of analyses founded on a solid fact base. It is a multi-faceted, long-term energy framework which has multiple aims, some of which include:

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

A draft version of the IEP was released for comment on 25 November 2016. 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 development of the IEP is an ongoing continuous process. It is reviewed periodically to take into account changes in the macroeconomic environment, developments in new technologies and changes in national priorities and imperatives, amongst others.

The 8 key objectives of the integrated energy planning process are as follows:

- » 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.

2.2.6. Integrated Resource Plan (IRP) for Electricity 2010 - 2030

The Integrated Resource Plan (IRP) for Electricity is a subset of the IEP and constitutes South Africa's National electricity plan. The IRP is an electricity infrastructure development plan based on least-cost electricity supply and demand balance, considering security of supply and the environment. The primary objective of the IRP is to determine the long-term electricity demand and detail how this demand should be met in terms of generating capacity, type, timing and cost. The IRP also serves as input to other planning functions, including amongst others, economic development and funding, and environmental and social policy formulation.

The promulgated IRP 2010–2030 identified the preferred generation technology required to meet expected demand growth up to 2030. It incorporated government objectives such as affordable electricity, reduced greenhouse gas (GHG) emissions, reduced water consumption, diversified electricity generation sources, localisation and regional development.

Following the promulgation of the IRP 2010–2030, implementation followed in line with Ministerial Determinations issued under Section 34 of the Electricity Regulation (Act No. 4) of 2006. The Ministerial

Determinations give effect to planned infrastructure by facilitating the procurement of the required electricity capacity.

Since the promulgated IRP 2010–2030, the following capacity developments have taken place:

- » A total 6 422 MW under the Renewable Energy Independent Power Producers Programme (REIPPP) has been procured, with 3 876 MW operational and made available to the grid.
- » IPPs have commissioned 1 005 MW from two Open Cycle Gas Turbine (OCGT) peaking plants.
- » Under the Eskom build programme, the following capacity has been commissioned:
 - * 1 332 MW of Ingula pumped storage, 1 588 MW of Medupi, 800 MW of Kusile and
 - * 100 MW of Sere Wind Farm.
- » 18 000MW of new generation capacity has been committed to.

Besides capacity additions, a number of assumptions have changed since the promulgation of IRP 2010–2030. Key assumptions that changed include the electricity demand projection, Eskom's existing plant performance, as well as new technology costs. In addition, environmental considerations such as South Africa's contribution to Greenhouse gases which contribute to climate change, local air quality and water availability have come to the fore.

These considerations necessitated the review and update of the IRP and ultimately the promulgation of a revised plan in October 2019. In terms of the IRP 2019, South Africa continues to pursue a diversified energy mix that reduces reliance on a single or a few primary energy sources. In the period prior to 2030, the system requirements are largely for incremental capacity addition (modular) and flexible technology, to complement the existing installed inflexible capacity. South Africa is a signatory to the Paris Agreement on Climate Change and has ratified the agreement. In line with INDCs (submitted to the UNFCCC in November 2016), South Africa's emissions are expected to peak, plateau and from year 2025 decline.

Following consideration of all these factors, the following Plan was promulgated.

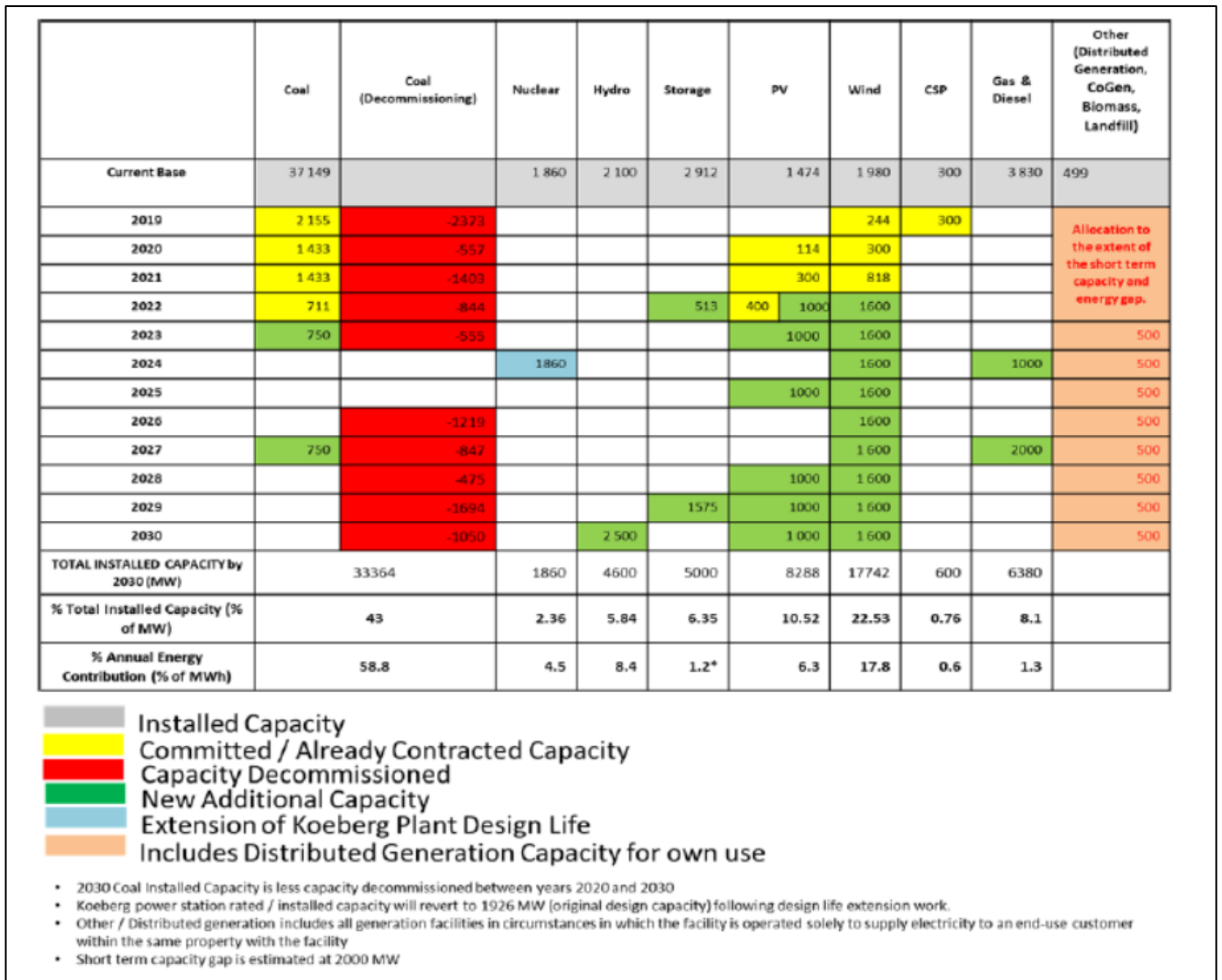


Figure 2.2: IRP 2019 as promulgated in October 2019

The development of the proposed power line infrastructure enables the evacuation of the generated power from the Hyperion Hybrid facility (comprising of both thermal generation technology and solar PV technology) into the national grid and thereby contributes to the energy mix of the country as set out in the IRP.

2.2.7. New Growth Path (NGP) Framework, 23 November 2010

The purpose of the New Growth Path (NGP) Framework is to provide effective strategies towards accelerated job-creation through the development of an equitable economy and sustained growth. The target of the NGP is to create 5 million jobs by 2020. With economic growth and employment creation as the key indicators identified in the NGP. The framework seeks to identify key structural changes in the economy that can improve performance in term of labour absorption and the composition and rate of growth.

To achieve this, government will seek to, amongst other things, identify key areas for large-scale employment creation, as a result of changes in conditions in South Africa and globally, and to develop a policy package to facilitate employment creation in these areas.

2.2.8. National Climate Change Bill, 2018

The Bill provides a framework for climate change regulation in South Africa aimed at governing South Africa's sustainable transition to a climate resilient, low carbon economy and society. The Bill provides a procedural outline that will be developed through the creation of frameworks and plans. The bill aims to provide for the coordinated and integrated response to climate change and its impacts, provide effective management of inevitable climate change impacts and to make a fair contribution to the global effort to stabilise greenhouse gas concentrations. The 132kV power line infrastructure will enable the evacuation of electricity generated by the Hyperion Hybrid Facility (comprising of both thermal generation technology and solar PV technology), which will go some way to addressing emissions associated with power generation facilities in the country.

2.2.9. National Climate Change Response Policy, 2011

South Africa's National Climate Change Response Policy (NCCRP) establishes South Africa's approach to addressing climate change, including adaptation and mitigation responses. The NCCRP formalises Government's vision for a transition to a low carbon economy, through the adoption of the 'Peak, Plateau and Decline' (PPD) GHG emissions trajectory whereby South Africa's emissions should peak between 2020 and 2025, plateau for approximately a decade, and then decline in absolute terms thereafter, and based on this the country has pledged to reduce emissions by 34% and 42% below Business As Usual (BAU) emissions in 2020 and 2025, respectively. This has been considered in the development of the IRP 2019.

2.2.10. Strategic Integrated Projects (SIPs)

In 2010, a National Development Plan was drafted to address socio-economic issues affecting development in South Africa. These issues were identified and placed under 18 different Strategic Integrated Projects (SIPs) to address the spatial imbalances of the past by addressing the needs of the poorer provinces and enabling socio-economic development. The development of the Hyperion-Kalbas 132kV power line will support the Strategic Integrated Projects SIP 10 – electricity transmission and distribution for all.

In support of SIP 10, the Department of Environmental Affairs undertook a Strategic Environmental Assessment (SEA) which aims to provide guidance for the efficient and sustainable expansion of strategic electricity grid infrastructure in South Africa. This SEA identified the optimal location for strategic corridors where transmission infrastructure expansion is needed to enable the balancing of future demand and supply requirements, while minimising negative impacts to the environment. These areas are referred to as Power Corridors and were gazetted within GNR113 of February 2018. The power line corridor proposed for the Hyperion-Kalbas 132kV power line is located within the Northern Transmission Corridor and is therefore considered to be aligned with national planning in this regard.

2.3. Provincial Planning and Context

2.3.1. Northern Cape Provincial Spatial Development Framework (PSDF) 2012)

The Northern Cape Provincial Spatial Development Framework (PSDF) 2012 states that the overarching goal for the Province is to enable sustainability through sustainable development. The Province considers social and economic development as imperative in order to address the most significant challenge facing the Northern Cape, which is poverty.

The PSDF considers the release of greenhouse gas (GHG) emissions created by human activity as the key cause of global warming, which in turn could result in major negative effects and disasters in the short- and medium-term. This effect would increasingly undermine human development gains. Innovative strategies would have to be implemented to reduce the impact of global deterioration.

The PSDF identifies key sectoral strategies and plans which are considered to be the key components of the PSDF. Sectoral Strategy 19 refers to a provincial renewable energy strategy. Within the PSDF a policy has been included which states that renewable energy sources (including the utilisation of solar energy) are to comprise 25% of the Province's energy generation capacity by 2020.

The overall energy objective for the Province also includes promoting the development of renewable energy supply schemes which are strategically important for increasing the diversity of domestic energy supply and avoiding energy imports, while also minimising the detrimental environmental impacts. The development of the Hyperion-Kalbas 132kV power line will enable additional uptake of energy into the national grid from the Hyperion Hybrid Facility, which will promote the province's objectives.

2.3.2. The Northern Cape Climate Change Response Strategy

The key aspects of the Northern Cape Climate Change Response Strategy (NCCCRS) Report are summarised in the MEC's (NCPG: Environment and Nature Conservation) 2011 budget speech: "The Provincial Climate Change Response Strategy will be underpinned by specific critical sector climate change adaptation and mitigation strategies that include the Water, Agriculture and Human Health sectors as the 3 key Adaptation Sectors, the Industry and Transport alongside the Energy sector as the 3 key Mitigation Sectors with the Disaster Management, Natural Resources and Human Society, livelihoods and Services sectors as 3 remaining key. Sectors to ensure proactive long-term responses to the frequency and intensity of extreme weather events such as flooding and wildfire, with heightened requirements for effective disaster management".

Key points from the MEC address include the NCPG's commitment to develop and implement policy in accordance with the National Green Paper for the National Climate Change Response Strategy (2010), and an acknowledgement of the NCP's extreme vulnerability to climate-change driven desertification. The development and promotion of a provincial green economy, including green jobs, and environmental learnership is regarded as an important provincial intervention in addressing climate change. The renewable energy sector, including solar and wind energy (but also biofuels and energy from waste), is explicitly indicated as an important element of the Provincial Climate Change Response Strategy. The MEC further indicated that the NCP was involved in the processing 7 wind energy facility and 11 solar energy facility EIA applications (March 2011).

The development of Hyperion-Kalbas 132kV power line will assist in achieving (although only to a limited extent) the promotion of the provincial green economy of the Northern Cape through the evacuation of generated solar power from the Hyperion Hybrid Facility.

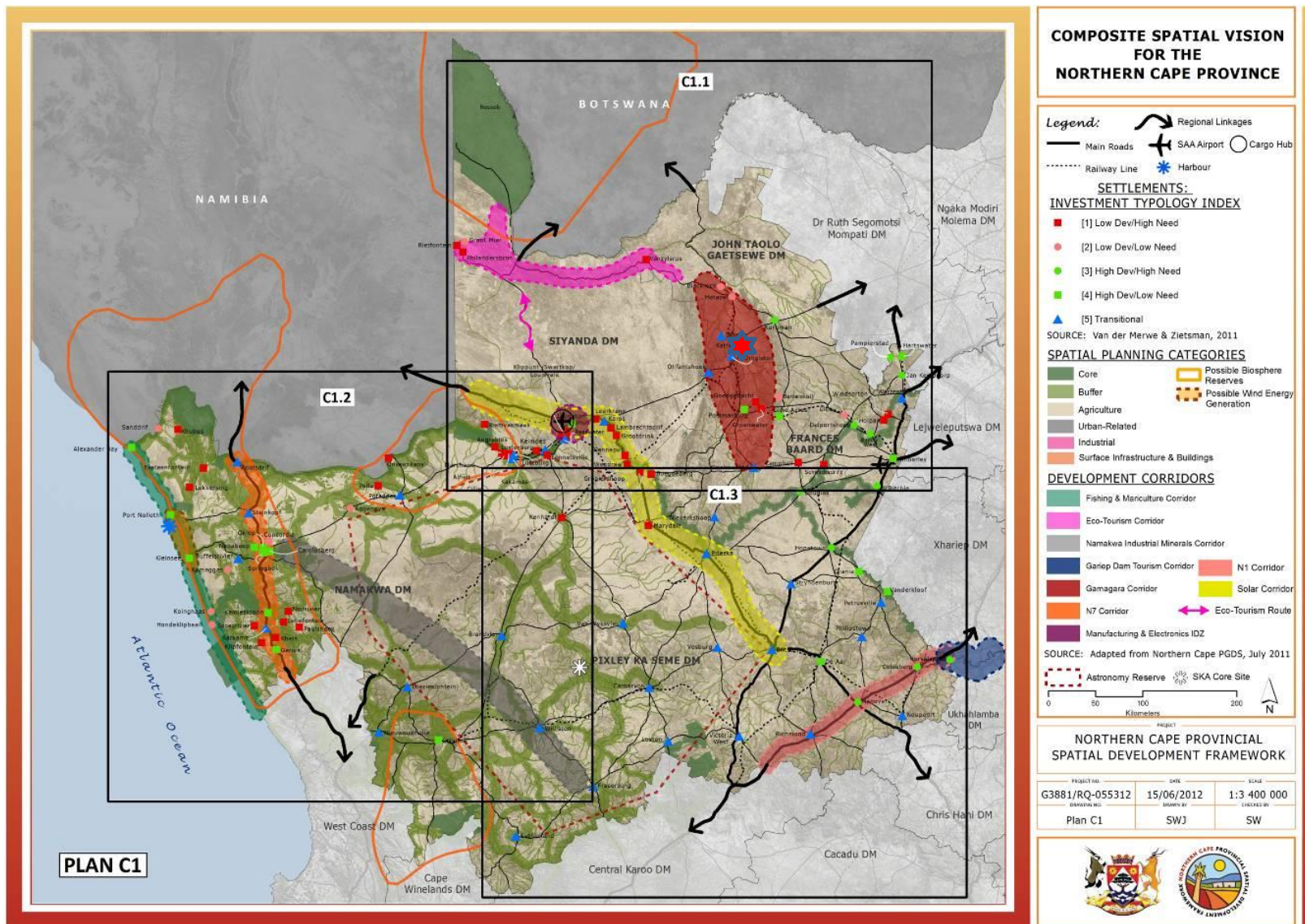


Figure 2.3: Development regions and corridors of the Northern Cape (Source: Northern Cape PSDF 2012). The position of the proposed Hyperion-Kalbas 132kV power line is indicated by the red star.

2.4. Local Policy and Planning Context

The strategic policies at the district and local level have similar objectives for the respective areas, namely, to accelerate economic growth, create jobs, uplift communities and alleviate poverty. The proposed development is considered to align with the aims of these policies, even if contributions to achieving the goals therein are only minor.

2.4.1. John Taolo Gaetsewe District Municipality Final Integrated Development Plan (IDP) 2017– 2022 (2017)

The vision of the John Taolo Gaetsewe District Municipality (DM) as contained within its Final IDP 2017 – 20 is:

“Working together for a better life for all in the district.”

The mission statement of John Taolo Gaetsewe DM reflects what the DM will do in an on-going manner to strive towards achieving its vision. The mission of the John Taolo Gaetsewe DM is:

“Accelerating the implementation of integrated development initiatives and providing support to local municipalities.”

In terms of development priorities, the Final 2017 – 2020 IDP determined that the results of the 2016 Community Survey suggested that the number of people residing within the DM is increasing, as a direct result of mining related activities. Implications for the DM in this regard include:

- » The scope and extent of the DM's Spatial Development Framework (SDF).
- » Service delivery demands placed on the DM and its local municipalities.
- » The grading of the local municipalities, and the resources (i.e. grants and subsidies) made available to them.

The activities of the DM need to reflect its population demographics, both in terms of service delivery, as well as in terms of employment equity. Gender, racial and disability population demographics have been identified as being of particular importance in this regard. As a result, special interest groups, such as the youth, women and persons with disabilities require specific focus in the strategic priorities of the DM.

The implementation of the 132kV power line for the Hyperion Hybrid Facility would contribute towards addressing some of the John Taolo Gaetsewe DM's development priorities through the creation of new employment opportunities which could support a portion of the increasing population, while the increase in revenue from the project could assist in the municipality in addressing service delivery demands.

2.4.2. John Taolo Gaetsewe District Municipality Phase 5 Draft Spatial Development Framework (SDF) (2017)'

The main economic sectors applied within the John Taolo Gaetsewe DM include eco-tourism, agriculture, mining and community services. Even though the development of renewable energy or hybrid energy is not specifically mentioned as part of the framework, the development of an energy generation facility within the area will add to the current economic sectors. That specifically includes community services, as the development of a solar energy facility will aid in the provision of electricity, as well as employment opportunities and skills development on a local level.

The SDF states that one of the key objectives for the DM is to attract new business. With the development of a Hyperion Hybrid Facility and 132kV power line within the area, other developers might be encouraged to consider the area as a viable location for further development. This could attract new business to the area and promote financial and socio-economic development within the DM.

2.4.3. Gamagara Local Municipality Integrated Development Plan (IDP) 2019 – 2022 (2019)

The vision for the Gamagara Local Municipality (LM) as contained within the IDP 2017 – 2022 is as follows:

“Build prosperous and sustainable communities.”

The Mission of the Gamagara LM is as follows:

“To provide universal, sustainable services to the community in order to attain a safe and healthy environment, as well as socio-economic development by exploiting economic benefits and strengthening stakeholder relations.”

The following strength, weaknesses, threats and opportunities (SWOT analysis) have been identified for the Gamagara LM:

Strengths:	Weaknesses:
<ul style="list-style-type: none"> » High potential for economic growth: <ul style="list-style-type: none"> * The municipality is at the centre of all economic activities around the mining industry in the region. The industrial area growth and development is phenomenal as many small industries and big industry come to the area so as to serve the mining needs in the area. * Small businesses have the potential to grow and serve the improving commercial and mining economic set-up. These businesses either provide mines with equipment or the sub-contract to big contractors in the mine. » High tourism potential: <ul style="list-style-type: none"> * Gamagara has a vast number of heritage sites that still need to be exploited. These include religious monuments and heritage sites, the oasis of the Kalahari, the caves, etc. » Political maturity and stability: <ul style="list-style-type: none"> * Co-operation between political parties in delivering services is a progressive one. * Ward Committees are functional and meeting their obligations as required. * There is strong political leadership and support to the municipal functioning. 	<ul style="list-style-type: none"> » Infrastructure: <ul style="list-style-type: none"> * Inadequate infrastructure to cater for the rapid development in the municipality. * Ageing infrastructure. » Ineffective internal systems and controls: <ul style="list-style-type: none"> * Communicating available systems and controls to junior officials is lacking and leading to some of the crucial tasks not being performed accordingly e.g. delegation of power. * Culture of non-payment is prevalent in the municipality because credit control policy is not fully implemented. * The municipality does not have a culture of retaining skilled personnel due to inconsistent implementation of policies or lack of induction of new employees. * Lack of by-laws to guide and enforce compliance e.g. credit control.
Opportunities:	Threats:

<ul style="list-style-type: none">» Developmental potential:<ul style="list-style-type: none">* Integration of stakeholder contribution to the development of the municipality is possible e.g. sector departments, mining industry, commercial industry, agricultural industry and tourism industry.* There is a potential to acquire more land for development.* Improve infrastructure and create jobs.» Internal systems could be improved:<ul style="list-style-type: none">* Can improve on the credit control system to encourage culture of payment for services and increase municipal revenue.* Improve customer care and uphold to the Batho Pele Principle.* Enhance the Local Economic Development (LED) and Tourism markets by disseminating the LED and Tourism strategy to members of the community using various methods of awareness.	<ul style="list-style-type: none">» National and international economic trends may destabilise the municipality to achieve its goals.» Retrenchments from the mines may affect the municipal revenue.» Influx of job seekers in the area is causing infrastructure system failure as they overload the system.
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The implementation of the proposed project would contribute somewhat towards addressing some of the weaknesses and threats identified for the Gamagara LM. Specifically, with regards to contributing towards Local Economic Development (LED) market, municipal revenue, and job creation.

2.5 Conclusion

The findings of the review of the relevant policies, programmes and documents pertaining to the energy sector indicate that the Hyperion-Kalbas 132kV power line, when considering it's functioning as part of a hybrid system, is supported at a national, provincial, and local level, and that the development will contribute towards the various targets and policy aims.

CHAPTER 3: PROJECT DESCRIPTION

This chapter provides an overview of the Hyperion-Kalbas 132kV power line and details the project scope, which includes the planning/design, construction, operation and decommissioning activities required for the development.

3.1. Legal Requirements as per the EIA Regulations, 2014 (as amended), for the undertaking of a Basic Assessment Report

This chapter of the Basic Assessment Report includes the following information required in terms of Appendix 1: Content of Basic Assessment Reports:

Requirement	Relevant Section
3(b) the location of the activity including (i) the 21 digit Surveyor General code of each cadastral land parcel, (ii) where available the physical address and farm name and (iii) where the required information in items (i) and (ii) is not available, the coordinates of the boundary of the property or properties.	The location of the proposed power line is detailed in Chapter 1, Table 1.1 , as well as in section 3.3 below.
3(c)(i)(ii) a plan which locates the proposed activity or activities applied for as well as the associated structures and infrastructure at an appropriate scale, or, if it is a linear activity, a description and coordinates of the corridor in which the proposed activity or activities is to be undertaken; or on land where the property has not been defined, the coordinates within which the activity is to be undertaken	A layout map illustrating the power line corridor (300m wide) within which the power line is planned to be developed is included as Figure 3.2 .
3(d)(ii) a description of the scope of the proposed activity, including a description of the activities to be undertaken including associated structures and infrastructure	A description of the activities to be undertaken with the development of the power line is included in section 3.6
3(f) a motivation for the need and desirability for the proposed development, including the need and desirability of the activity in the context of the preferred location.	The need and desirability of the development of the power line is included and discussed as a whole within section 3.2
3(g) a motivation for the preferred site, activity and technology alternative	The motivation for the alternatives identified for the Hyperion-Kalbas power line are included in section 3.5.
3(h)(i) details of the alternative considered	The details of all alternatives considered for the Hyperion-Kalbas power line are included in section 3.5.
3(h)(ix) the outcome of the site selection matrix	The site selection process followed by the developer in order to identify the power line corridor for the Hyperion-Kalbas power line is described in section 3.5.
3(h)(x) if no alternatives, including alternative locations for the activity were investigated, the motivation for not considering such	Where no alternatives have been considered, motivation has been included. This is included in section 3.5.

3.2. Need & Desirability

One of the requirements of Appendix 1 of the EIA Regulations, 2014, as amended, is to motivate for “the need and desirability for the proposed development, including the need and desirability of the activity in the context of the preferred location”. The need and desirability of a development needs to consider whether it is the right time and place for locating the type of land-use / activity within the proposed location.

The need and desirability for the proposed project is directly linked to the need for the Hyperion Hybrid Facility as the main purpose of the grid infrastructure is to connect this facility to the national grid at a feasible connection point (i.e. the existing Kalbas Substation). Given the relationship between, and the necessity of, the proposed power line for the Hyperion Hybrid Facility, similar need and desirability considerations are applicable. These are aligned with national, regional, and local policies and plans, as detailed below:

- » The need at a national level to diversify the power generation technology mix, as defined in the Integrated Resource Plan (IRP), 2019 (as discussed in detail in **Chapter 2**).
- » The need for the acquisition of capacity needed to supplement Eskom's declining plant performance and to reduce the extensive utilisation of diesel peaking generators in the immediate to medium term, as defined in the IRP 2019. The Hyperion Hybrid Facility is being proposed in response to the procurement process initiated by the Independent Power Producer Office (IPP Office) for the procurement of up to 2000MW of dispatchable generation capacity from a range of technologies. The hybrid facility and its associated power line infrastructure is being developed as an innovative solution to comprise of thermal generation (using LPG or diesel as a fuel source) and renewable energy via solar energy in direct response to the 2000MW RMIPPPP. The project therefore aims to meet both the short-term requirements of providing affordable dispatchable generation capacity, but also meet the long-term goal of operating by the use of “other” technology.
- » The need to align development with the requirements of the National Development Plan in order to address the identified socio-economic issues affecting development in South Africa.
- » The need for sustainable development at a Provincial level, including the need to utilise its extensive resources for the benefits of the local area.
- » The identification of the need for potential IPP projects to become operational in the local municipality as per the Gamagara Local Municipality Integrated Development Plan.

From an overall environmental sensitivity and planning perspective, the proposed power line supports the broader strategic context of the municipality as it is linked to an energy facility which is considered a driver for economic growth in the region as per the John Taolo Gaetsewe District Municipality's Integrated Development Plan. It is also in line with broader societal needs and the public interest as it is linked to an energy generation facility, for which there is national policy and support. No exceedance of social, ecological, heritage or avifaunal limits will result from the construction of the proposed project, and no significant disturbance of biological diversity is anticipated, as detailed in this Basic Assessment Report.

The project will assist in reaching these objectives as the IDP of the municipality aims to ensure that the quality of life of the John Taolo Gaetsewe District community through purposeful and quality service, and the effective and optimal utilisation of resources is achieved. This project will assist in supporting the local and national electricity supply through the connection of an energy facility to the national electricity grid. The project will further assist in local job creation which will further help achieve IDP objectives and inject money into the local and regional economy.

3.3. Project Site Description

The project site is located within Ward 7 of the Gamagara Local Municipality within the greater John Taolo Gaetsewe District Municipality in the Northern Cape Province. The 132kV power line crosses the following properties:

- » Remainder of Farm Kathu 465
- » Portion 1 of Farm Selsden 464
- » Remainder of Farm Lyndoch 432

The entire extent of the 132kV power line corridor is located within the northern corridor for the Strategic Transmission Corridors (**Figure 3.1**).

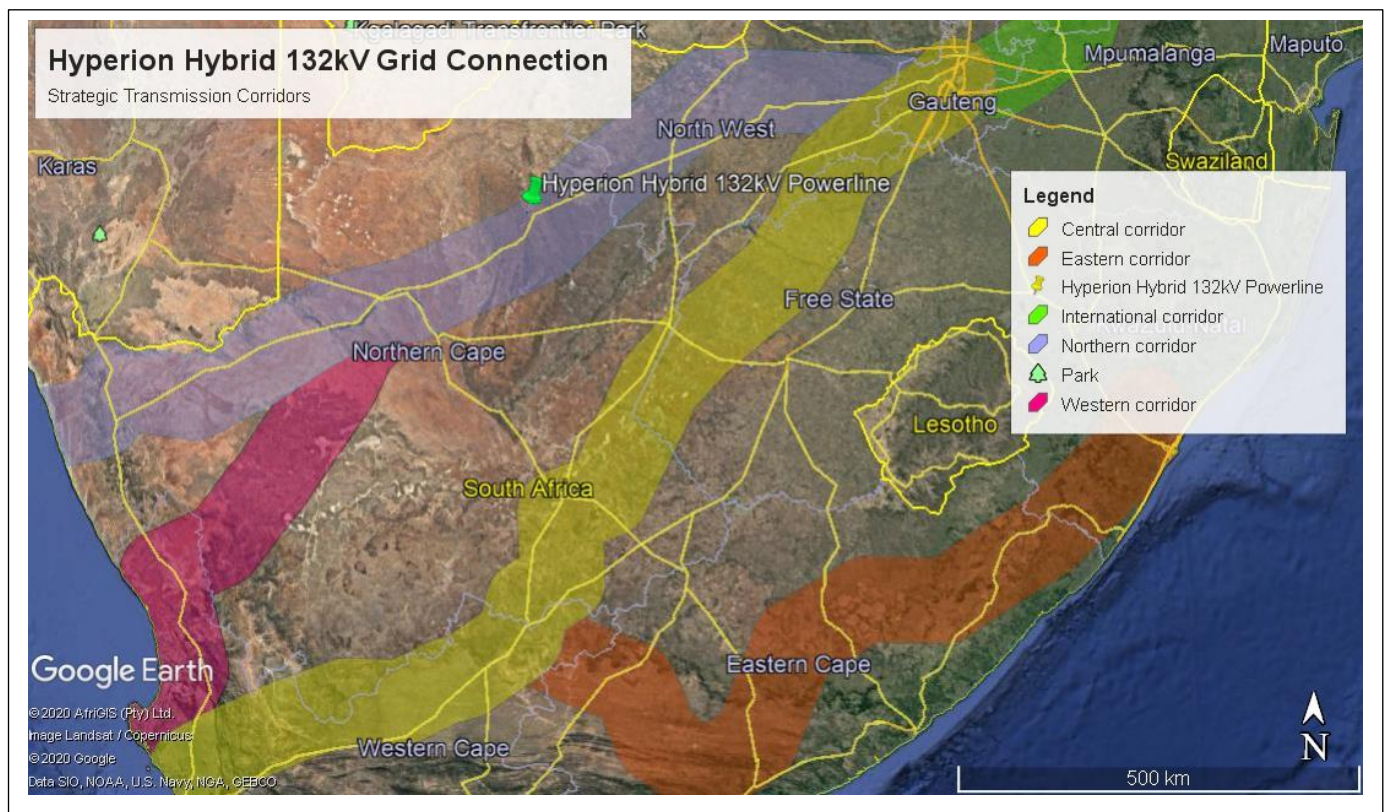


Figure 3.1: Location of proposed 132kV power line within the northern corridor of the Strategic Transmission Corridors (GNR 113)

3.4. Nature and extent of the power line infrastructure for the Hyperion Hybrid Facility

The establishment of the 132kV power line between the Hyperion and Kalbas substations is proposed to allow for evacuation of the generated electricity from the Hyperion Hybrid Facility to the national grid. The connection infrastructure includes:

- » A single- or double-circuit 132kV overhead power line; and
- » Associated infrastructure:
 - Laydown areas.
 - Servitude road

A summary of the details and dimensions of the infrastructure planned for the development is provided below in **Table 2.1**.

Table 2.1: Details or dimensions of the proposed power line infrastructure

Infrastructure	Footprint, dimensions and details
Corridor width (for assessment purposes)	300m wide and 8km long
Power line length	8km
Power Line Capacity	132kV
Power Line Servitude Width	32m
Height of the Towers	24m

Figure 3.2 illustrates the Hyperion-Kalbas 132kV power line corridor assessed within this Basic Assessment.

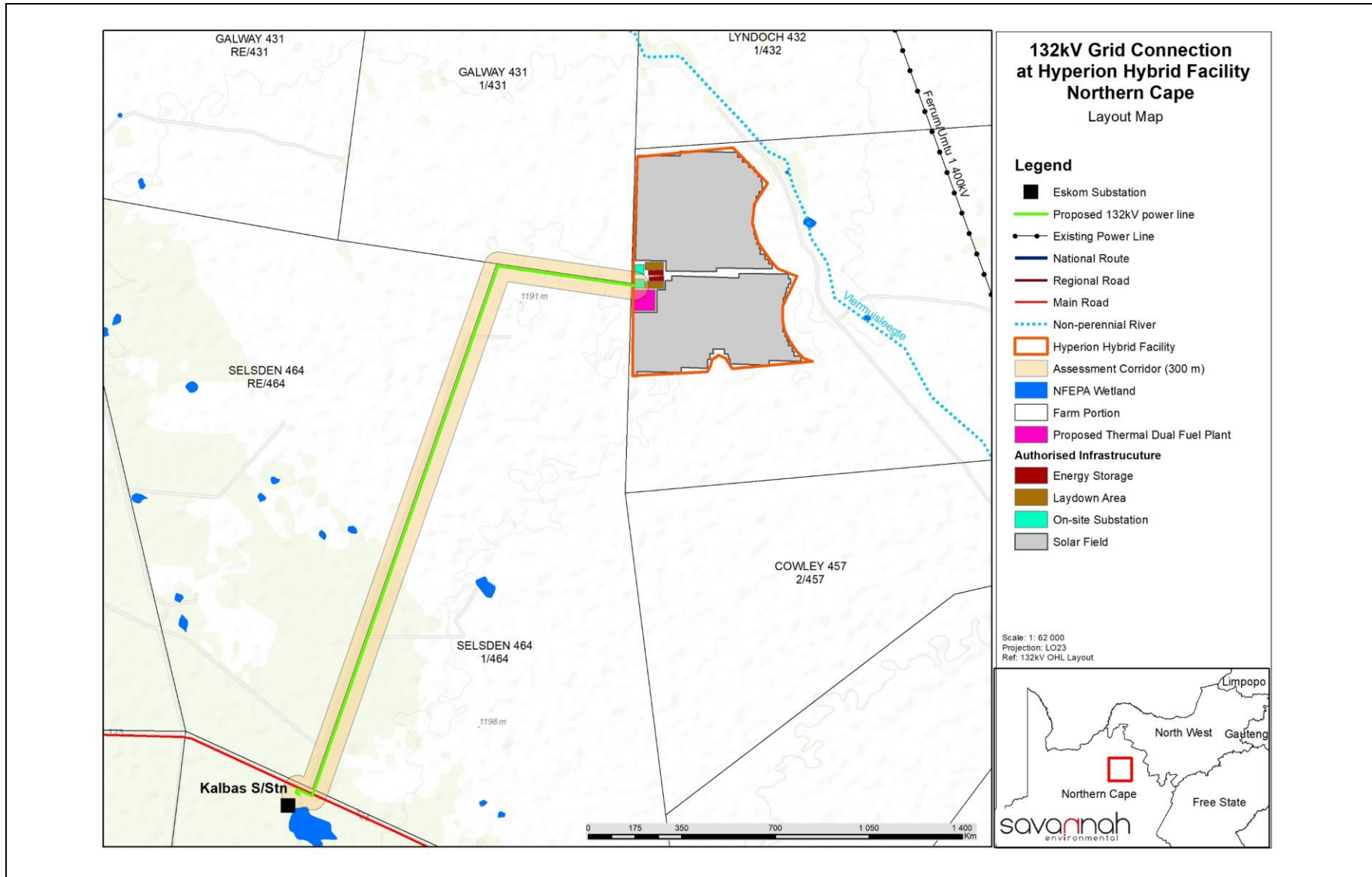


Figure 3.2: Map illustrating the layout of the 132kV power line at the Hyperion Hybrid Facility, which is assessed in this BA Report

3.5. Description of Project Alternatives

In accordance with the requirements of Appendix 3 of the 2014 EIA Regulations (GNR 326), an EIA process must contain a consideration of alternatives, which can include site (i.e. development footprint), activity, technology and site access alternatives, as well as the “do-nothing” alternative. Alternatives are required to be assessed in terms of social, biophysical, economic and technical factors.

The sections which follow provide details of the feasible alternatives indentified and assessed for the power line. No activity alternatives are associated with the development of the power line due to the specific requirements for the infrastructure to connect the Hyperion Hybrid Facility to the national grid. Therefore, no activity alternatives are considered for the project.

3.5.1. Location Alternatives

The proposed power line will connect the Hyperion Hybrid Facility to the existing Eskom Kalbas substation. This connection point has been determined to be a technically feasible option as it has sufficient capacity to evacuate the power generated by the proposed Hyperion Hybrid Facility into the national grid. No other feasible connection points have been identified. The proposed power line route runs directly parallel to the proposed access road for the hybrid facility in order to minimise the overall development corridor for linear infrastructure in the landscape and the associated environmental impacts. The corridor location within the farm portions represents the most direct route between the two substations, thereby reducing the length of the power line and the associated environmental impacts. No feasible corridor alternatives have been identified for assessment within the Basic Assessment process.

3.5.2. Design and Layout Alternatives

The design of the power line is required to conform to Eskom's technical standards as it will form part of the national electricity supply network and must therefore be in line with the existing network systems, technology, and infrastructure. As such, technical specifications as determined by Eskom will be adhered to by the proponent. Therefore, no design alternatives are assessed within this BA Report.

A broader power line corridor is being assessed within this BA Report in order to accommodate a site-specific layout of the power line such that identified environmental sensitivities can be avoided, where possible, and any specific landowner conditions complied with. No layout alternatives are assessed within this BA Report. The power line will be appropriately located within the broader corridor during the final design phase following landowner negotiation and final surveys.

3.5.3. Technology Alternatives

No technology alternatives exist for similar large-scale distribution of electricity, with conductor technology having been refined for numerous years by Eskom and employed throughout the country. As such, the selected technology is regarded the most suitable and appropriate for this development type, and no technology alternatives are assessed for the project as part of this BA process.

3.5.4. The “Do-Nothing” Alternative

The 'do-nothing' alternative is the option of Hyperion Solar Hybrid (Pty) Ltd not constructing the Hyperion-Kalbas power line. This would result in no environment or social impacts (positive or negative) as a result of the development of the 132kV power line. However, the benefits associated with the Hyperion Hybrid Facility would also be foregone. This alternative is assessed in Chapter 6.

3.6. Activities during the Project Development Stages

In order to establish the Hyperion-Kalbas 132kV power line, a series of activities will need to be undertaken during the design, pre-construction, construction, operation, and decommissioning phases. These are discussed in more detail in **Table 2.2** below.

Table 2.2: Details of the power line infrastructure development phases (i.e. construction, operation and decommissioning)

Construction Phase	
	<ul style="list-style-type: none"> » Duration of the construction phase is expected to be up to 10 months. » The project will create up to 50 employment opportunities for the local community members during the construction phase. » No on-site labour camps will be permitted. Employees are to be accommodated in the nearby town of Kathu and will be transported to the main contractor camp and the workstations (tower positions) on a daily basis. » Overnight on-site worker presence, if required, will be limited to security staff. » Construction waste will be stored at the main Contractor's Camp and the removal will be undertaken by a sub-contractor or the Gamagara Local Municipality. » At least 10 000m³ of water will be required for the duration of the construction phase. Where possible, water either be sourced from the Gamagara Local Municipality or from private sources.
Construction Sequence	<p>Overhead power lines are constructed in the following simplified sequence:</p> <ul style="list-style-type: none"> » Step 1: Surveying of the development corridor and negotiating with affected landowners. » Step 2: Final design and micro-siting of the infrastructure based on geotechnical, topographical conditions and potential environmental sensitivities; obtain required environmental permits (e.g. biodiversity permits, heritage permits & WUL/GA). » Step 3: Vegetation clearance and construction of access roads/tracks (where required). » Step 4: Construction of tower foundations. » Step 5: Assembly and erection of infrastructure within and along the corridor. » Step 6: Stringing of conductors. » Step 7: Rehabilitation of disturbed areas. » Step 8: Continued maintenance. <p>The final definition of the centre line for the power line and co-ordinates of each bend in the line (if applicable) will be determined on receipt of an environmental authorisation of the assessed corridor from the Competent Authority and after negotiations with landowners and final environmental and technical surveys².</p>
Activities to be Undertaken	
Conduct surveys prior to construction	<ul style="list-style-type: none"> » Including, but not limited to: a geotechnical survey, environmental surveys, site survey (survey the location of each power line tower position) and confirmation of the power line servitude, and all other associated infrastructure.

Undertake Preparation	Site	<ul style="list-style-type: none"> » Including the clearance of vegetation within the power line corridor and servitude for the placement of the power line tower foundations, power line tower positions, the establishment of access roads/tracks and excavations for foundations. » Stripping of topsoil at each of the tower position footprint areas and along the access road. Soil will be stockpiled and used for backfilling and rehabilitation purposes. » Stripping of soil and the clearance of vegetation will be undertaken in a systematic manner in order to reduce the risk of the exposed ground being prone to erosion. » Search and Rescue (for flora and fauna species of concern), where required and the identification of any cultural/heritage sites worthy of conservation along the final power line route.
Establishment of a Laydown Area	a	<ul style="list-style-type: none"> » A Laydown Area for the storage of grid infrastructure components, including the civil engineering construction equipment. » No borrow pits will be required. Infilling or depositing materials will be sourced from licensed borrow pits within the surrounding areas.
Undertake Rehabilitation	Site	<ul style="list-style-type: none"> » Commence with rehabilitation efforts once construction is completed in an area, and all construction equipment is removed. » On commissioning, access points to the site that will not be required for the operation phase will be closed and prepared for rehabilitation.

Operation Phase

- » Duration will be ~20 years.
- » Requirements for security and maintenance of the power line infrastructure.
- » Employment opportunities relating mainly to operation activities and maintenance. Very limited employment opportunities will be available. It must be noted that ownership of the power line will be transferred to Eskom following the completion of construction. The operation and maintenance of the line will be undertaken by Eskom.
- » Current land-use activities, i.e. grazing and game farming, can continue in the areas adjacent to the infrastructure.

Activities to be Undertaken

Operation and Maintenance		<ul style="list-style-type: none"> » On-going rehabilitation of those areas which were disturbed during the construction phase. » During this operation phase vegetation within the power line servitude (up to 32m), will require management only if it impacts on the safety and operational objectives of the project. » The maintenance of the power line will be undertaken by Eskom who will be responsible for operation of the power line.
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Decommissioning Phase

Requirements	<ul style="list-style-type: none"> » Decommissioning of the power line infrastructure at the end of its economic life. » Expected lifespan of approximately 20 years (with maintenance) before decommissioning is required. » Decommissioning activities to comply with the legislation relevant at the time.
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Activities to be undertaken

Site preparation	<ul style="list-style-type: none"> » Confirming the integrity of access to the power line to accommodate the required equipment. » Mobilisation of decommissioning equipment.
Disassemble components and rehabilitation	<ul style="list-style-type: none"> » The power line components will be disassembled and reused and recycled (where possible). » Where components cannot be reused or recycled these will be disposed of in accordance with the regulatory requirements at the time of decommissioning.

- » Disturbed areas, where infrastructure has been removed, will be rehabilitated, if required and depending on the future land-use of the affected areas and the relevant legislation applicable at the time of decommissioning.

Land use activities within the vicinity of the corridor include game farming and agriculture. It is expected that the areas affected by the development of the power line will be rehabilitated back to their original land use, such that the affected areas can be used for grazing during the operation phase of the power line. The areas affected by decommissioning activities when the power line reaches its economic life and all infrastructure is decommissioned, will be rehabilitated and where possible and depending on the landowner requirements, the original land use of the area will be retained.

CHAPTER 4: APPROACH TO UNDERTAKING THE BASIC ASSESSMENT PROCESS

In terms of the EIA Regulations of December 2014 (amended in April 2017) published in terms of the NEMA (Act No. 107 of 1998) as amended, the establishment of Hyperion-Kalbas 132kV power line triggers listed activities requiring environmental authorisation.

The BA process aims at identifying and describing potential environmental issues associated with the development of the proposed power line. In order to ensure that a comprehensive assessment is provided to the competent authority and I&APs regarding the impacts of the facility, detailed independent specialist studies were undertaken as part of the BA process. In addition, a comprehensive consultation process was conducted, and includes I&APs, the competent authority, directly impacted landowners/occupiers, relevant Organs of State departments, ward councillors and other key stakeholders. This chapter serves to outline the process that was followed during the BA process.

4.1 Legal Requirements as per the EIA Regulations, 2014 (as amended), for the undertaking of a Basic Assessment Report

This chapter of the BA report includes the following information required in terms of Appendix 1: Content of the BA Report:

Requirement	Relevant Section
3(d)(i) a description of the scope of the proposed activity, including all listed and specified activities triggered and being applied for.	All listed activities triggered as a result of the development of the proposed Hyperion-Kalbas 132kV power line have been included in section 4.2, Table 4.1 . The specific project activity relating to the relevant triggered listed activity has also been included in Table 4.1 .
3(h)(ii) details of the public participation process undertaken in terms of Regulation 41 of the Regulations, including copies of the supporting documents and inputs.	The details of the public participation process undertaken for the project has been included and described in section 4.3.2.
3(h)(iii) a summary of the issues raised by interested and affected parties, and an indication of the manner in which the issues were incorporated, or the reasons for not including them.	All comments raised during the 30-day review and comment period of the BA Report and through on-going consultation with I&APs will be included as part of a C&R report (Appendix C8) to be submitted as part of the Final BA Report to DEFF for decision-making..
3(h)(vi) the methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks associated with the alternatives.	The methodology used to assess the significance of the impacts of the proposed infrastructure has been included in section 4.4.
(o) a description of any assumptions, uncertainties, and gaps in knowledge which relate to the assessment and mitigation measures proposed.	The assumptions and limitations of the BA process being undertaken is included in section 4.6.

4.2 Relevant legislative permitting requirements

The legislative permitting requirements applicable to the proposed project as identified at this stage in the process are described in more detail under the respective sub-headings.

4.2.1 National Environmental Management Act (No. 107 of 1998) (NEMA)

NEMA is South Africa's key piece of national environmental legislation that provides for the authorisation of certain controlled activities known as "listed activities". In terms of Section 24(1) of NEMA, the potential impact on the environment associated with listed activities must be considered, investigated, assessed and reported on to the competent authority (the decision-maker) charged by NEMA with granting of the relevant EA. Since the proposed 132kV power line will be connected to the Hyperion Hybrid Facility, which is a power generation activity, and therefore relates to the IRP 2010 – 2030, 2019³, the National DEFF has been determined as the Competent Authority in terms of GNR 779 of 01 July 2016. The Provincial Northern Cape Department of Agriculture, Environmental Affairs, Rural Development and Land Reform is a commenting Authority on the project.

The need to comply with the requirements of the EIA Regulations published under the NEMA ensures that proponents are provided the opportunity to consider the potential environmental impacts of their activities early in the project development process, and also allows for an assessment to be made as to whether environmental impacts can be avoided, minimised or mitigated to acceptable levels. Comprehensive, independent environmental studies are required to be undertaken in accordance with the EIA Regulations to provide the competent authority with sufficient information in order for an informed decision to be taken regarding the project and Application for Environmental Authorisation.

The BA process being conducted for the Hyperion-Kalbas 132kV power line is being undertaken in accordance with Section 24 (5) of the NEMA. Section 24 (5) of NEMA pertains to Environmental Authorisations (EAs), and requires that the potential consequences for, or impacts of, listed or specified activities on the environment be considered, investigated, assessed, and reported on to the competent authority. Listed Activities are activities identified in terms of Section 24 of the NEMA which are likely to have a detrimental effect on the environment, and which may not commence without an EA from the competent authority subject to the completion of an environmental assessment process (either a Basic Assessment (BA) or full Scoping and EIA).

Table 4.1 details the listed activities in terms of the EIA Regulations, 2014 (as amended) which apply to the Hyperion-Kalbas 132kV power line, and for which an Application for Environmental Authorisation has been submitted to DEFF. The table also includes a description of the specific project activities which relate to the applicable listed activities.

Table 4.1: Listed activities as per the EIA regulations which are triggered by establishment of Hyperion-Kalbas 132kV power line

³ The Integrated Resource Plan (IRP) is legislated policy which regulates power generation planning.

Indicate the number and date of the relevant notice:	Activity No (s) (in terms of the relevant notice):	Describe each listed activity as per project description
GN 327, 08 December 2014 (as amended on 07 April 2017)	11 (i)	<p>The development of facilities or infrastructure for the transmission and distribution of electricity -</p> <p>(i) outside urban areas or industrial complexes with a capacity of more than 33 but less than 275 kilovolts.</p> <p>The project entails the construction and operation of 132kV overhead power line to connect the Hyperion Hybrid Facility to the national grid via the existing Eskom Kalbas Substation. The development will occur outside of an urban area.</p>

4.2.2 National Water Act (No. 36 of 1998) (NWA)

In accordance with the provisions of the National Water Act (No. 36 of 1998) (NWA), all water uses must be licensed with the Competent Authority (i.e. the Regional DWS). Water use is defined broadly, and includes taking and storing water, activities which reduce stream flow, waste discharges and disposals, controlled activities (activities which impact detrimentally on a water resource), altering a watercourse, removing water found underground for certain purposes, and recreation.

Table 4.1 lists Water Uses associated with the proposed project and identified in terms of the NWA which require licensing either in the form of a General Authorisation (GA), or in the form of a Water Use License (WUL). The table also includes a description of those project activities which relate to the applicable Water Uses.

Table 4.1: List of Water Uses published under Section 21 of NWA, as amended.

Notice No.	Activity No.	Description of Water Use
NWA (No. 36 of 1998)	Section 21 (c)	<p>Impeding or diverting the flow of water in a watercourse.</p> <p>The development of Hyperion-Kalbas 132kV power line will encroach within the regulated area (500m) of surrounding pans in the area.</p>
	Section 21 (i)	<p>Altering the bed, banks, course or characteristics of a watercourse.</p> <p>The development of Hyperion-Kalbas 132kV power line will encroach within the regulated area (500m) of surrounding pans in the area.</p>

In the event that the power line is located within the regulated area of the pans in the area, application would need to be made for a WUL in accordance with the requirements of the Regulations Regarding the Procedural Requirements for Water Use License Applications and Appeals (GNR 267), or a GA registered in accordance with the requirements of Revision of General Authorisation. The process of applying for a WUL or GA registration will only be completed once a positive EA has been received and the project selected as a Preferred Bidder. This is in line with the requirements of the Department of Human Settlements, Water and Sanitation.

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

The National Heritage Resources Act (No. 25 of 1999) (NHRA) provides an integrated system which allows for the management of national heritage resources and to empower civil society to conserve heritage resources for future generations. Section 38 of NHRA provides a list of activities which potentially require the undertaking of a Heritage Impact Assessment.

Section 38: Heritage Resources Management

- 1). *Subject to the provisions of subsections (7), (8) and (9), any person who intends to undertake a development categorised as –*
- a. *the construction of a road, wall, power line, pipeline, canal or other similar form of linear development or barrier exceeding 300m in length;*
 - b. *the construction of a bridge or similar structure exceeding 50m in length;*
 - c. *any development or other activity which will change the character of a site –*
 - i). *exceeding 5 000m² in extent; or*
 - ii). *involving three or more existing erven or subdivisions thereof; or*
 - iii). *involving three or more erven or divisions thereof which have been consolidated within the past five years; or*
 - iv). *the costs of which will exceed a sum set in terms of regulations by SAHRA or a provincial heritage resources authority;*

Must at the very earliest stages of initiating such a development, notify the responsible heritage resources authority and furnish it with details regarding the location, nature and extent of the proposed development.

In terms of Section 38(8), approval from the heritage authority is not required if an evaluation of the impact of such development on heritage resources is required in terms of any other legislation (such as NEMA), provided that the consenting authority ensures that the evaluation of impacts fulfils the requirements of the relevant heritage resources authority in terms of Section 38(3) and any comments and recommendations of the relevant resources authority with regard to such development have been taken into account prior to the granting of the consent. However, should heritage resources of significance be affected by the proposed power line infrastructure, a permit is required to be obtained prior to disturbing or destroying such resources as per the requirements of Section 48 of the NHRA, and the SAHRA Permit Regulations (GNR 668).

A Heritage Impact Assessment has been undertaken as part of the BA Process (refer to **Appendix F**).

4.3 Overview of the Basic Assessment Process for establishment of Hyperion-Kalbas 132kV power line

Key tasks undertaken for the BA included:

- » Consultation with relevant decision-making and regulating authorities (at National, Provincial and Local levels).
- » Submission of the completed Application for Environmental Authorisation to the competent authority (i.e. DEFF) in terms of Regulations 5 and 6 of the EIA Regulations, 2014 (GNR 326), as amended.

- » Undertaking a public participation process in accordance with Chapter 6 of GNR326, and the Department of Environmental Affairs (2017), Public Participation guidelines in terms of NEMA EIA Regulations, Department of Environmental Affairs, Pretoria, South Africa (hereinafter referred to as "the Guidelines") in order to identify issues and concerns associated with the proposed project.
- » Considerations of the restrictions enforced in terms of Government Gazette 43096 which placed the country in a national state of disaster limiting the movement of people to curb the spread of the COVID-19 virus.
- » Undertaking of independent specialist studies in accordance with Appendix 6 of the EIA Regulations, 2014 (GNR326), as amended and the relevant Specialist Protocols defined in Government Notice 320 of 20 March 2020, as relevant.
- » Preparation of a BA report and EMPr in accordance with the requirements of Appendix 1 and Appendix 4 of GNR326.
- » 30-day public and authority review period of the BA report.
- » Compilation of a Comments and Responses (C&R) report detailing the comments raised by I&APs, addressing these comments in detail and finalisation of the BA report.
- » Submission of a final BA report to the DEFF for review and decision-making

The tasks are discussed in detail in the sub-sections below.

4.3.1. Authority Consultation and Application for Authorisation in terms of the 2014 EIA Regulations (as amended)

Consultation with the regulating authorities (i.e. DEFF and NC DAEARD&LR) as well as with all other relevant Organs of State has been undertaken and will continue throughout the BA process. To date, this consultation has included the following:

- » Submission of a Public Participation Plan for approval prior to the commencement of the process.
- » Submission of the application for Environmental Authorisation to the DEFF.
- » Submission of the BA Report for review and comment by:
 - * The competent and commenting authorities.
 - * State departments that administer laws relating to a matter affecting the environment relevant to an application for Environmental Authorisation.
 - * Organs of State which have jurisdiction in respect of the activity to which the application relates.

As per the approved public participation plan all correspondence with authorities has been via electronic communication/electronic formats. A record of all authority correspondence undertaken during the BA process is included in **Appendix C**.

4.3.2. Public Participation Process

Public participation is an essential and regulatory requirement for an environmental authorisation process and is guided by Regulations 41 to 44 of the EIA Regulations 2014 (GN R326) (as amended). The purpose of public participation is clearly outlined in Regulation 40 of the EIA Regulations 2014 (GN R326) (as amended) and is being followed for this proposed project.

The sharing of information forms the basis of the public participation process and offers the opportunity for I&APs to become actively involved in the BA process from the outset. The public participation process is designed to provide sufficient and accessible information to I&APs in an objective manner. The public participation process affords I&APs opportunities to provide input into and receive information regarding the BA process in the following ways:

During the BA process the online stakeholder engagement platform will allow for the following:

- » provide an opportunity to submit comments regarding the project;
- » assist in identifying reasonable and feasible alternatives;
- » contribute relevant local information and knowledge to the environmental assessment;
- » allow registered I&APs to verify that their comments have been recorded, considered and addressed, where applicable, in the environmental investigations;
- » foster trust and co-operation;
- » generate a sense of joint responsibility and ownership of the environment; and
- » comment on the findings of the environmental assessments.

During the decision-making phase:

- » to advise I&APs of the outcome of the competent authority's decision, and how and by when the decision can be appealed.

The public participation process therefore aims to ensure that:

- » Information containing all relevant facts in respect of the application is made available to potential stakeholders and I&APs for their review.
- » The information presented during the public participation process is presented in such a manner, i.e. local language and technical issues, that it avoids the possible alienation of the public and prevents them from participating.
- » Public participation is facilitated in such a manner that I&APs are provided with a reasonable opportunity to comment on the project.
- » Various ways are provided to I&APs to correspond and submit their comments i.e. online stakeholder engagement platform, fax, post, email, whatsapp and sms.
- » An adequate review period is provided for I&APs to comment on the findings of the BA Report.

The Public Participation Process undertaken for the proposed establishment of Hyperion-Kalbas 132kV power line considers the restrictions and limitations imposed by Government through section 27 (2) of the Disaster Management Act (Act No. 57 of 2002) of 2002 and the Directions issued by the Minister of Forestry and Fisheries (DEFF) in terms of consultations with I&APs. A Public Participation Plan was prepared and submitted to the DEFF on 14 October 2020. Approval of the Plan was provided by the DEFF Case Officer via email on 15 October 2020 (**Appendix C8**).

Together with the standard public participation approach, additional alternative means of undertaking consultation have been designed and implemented by Savannah Environmental to ensure that I&APs are afforded sufficient opportunity to access project information and raise comments on the project through an interactive web-based platform (i.e. online stakeholder engagement platform) readily available and accessible

to any person registering their interest in the project, and ensures that the public participation process is undertaken in line with Regulations 41 to 44 of the EIA Regulations, 2014 as amended. The Public Participation Plan (**Appendix C8**) considers the limitations applied by the Disaster Management Act Regulations prohibiting the gathering of people, limitations which certain I&APs may have in terms of access to computers and internet, as well as access to public spaces currently not open for operation that inhibits access to hard copy documentation. The online stakeholder engagement platform utilised by Savannah Environmental for the project allows the EAP to visually present details regarding the project as well as consultation documentation, including project maps and plans, presentations and posters. The platform also contains the BA report available for review. The use of an online tool enables stakeholders and I&APs to explore the project-specific content in their own time, and still enables them to participate in a meaningful way in the consultation process. The online platform allows for feedback and comments to be submitted by I&APs, in so doing saving time for the stakeholder and also giving the assurance that their comments have been submitted for inclusion in the project reporting. Access to the project documentation via the Savannah Environmental website remains unrestricted to all I&APs. I&APs wanting to access the report electronically are required to request a release code to access the documents in order to register the I&AP on the project database. The online portal supports the EAP in maintaining a complete and accurate record and database of all parties who have interest in the project (and who choose to access the report via the online portal), in line with the requirements of the Regulations.

Where I&APs do not have access to the online platform, information has been shared via other means such as telephone, email, WhatsApp CD and communication via the Ward Councillor and community representatives.

The schematic illustration below provides an overview of the tools that are available to I&APs and stakeholders to access project information and interact with the public participation team to obtain project information and resolve any queries that may arise, and to meet the requirements for public participation.



Tasks undertaken as part of the public participation process are described in the sections which follow.

i. Stakeholder identification and Register of Interested and Affected Parties

42. A proponent or applicant must ensure the opening and maintenance of a register of I&APs and submit such a register to the competent authority, which register must contain the names, contact details and addresses of –
- (a) All persons who, as a consequence of the public participation process conducted in respect of that application, have submitted written comments or attended meetings with the proponent, applicant or EAP;
 - (b) All persons who have requested the proponent or applicant, in writing, for their names to be placed on the register; and
 - (c) All organs of state which have jurisdiction in respect of the activity to which the application relates.

I&APs have been identified through a process of networking and referral, obtaining information from Savannah Environmental's existing stakeholder database, liaison with potentially affected parties in the greater surrounding area and a registration process involving the completion of a reply form. Key stakeholders and

affected and surrounding landowners have been identified and registered on the project database. Other stakeholders are required to formally register their interest in the project through either directly contacting the Savannah Environmental Public Participation team via email or fax or use of the online stakeholder engagement platform. An initial list of key stakeholders identified and registered is listed in **Table 4.3**.

Table 4.3: List of Stakeholders identified for the inclusion in the project database during the public participation process for establishment of the Hyperion-Kalbas 132kV power line

Organs of State
National Government Departments
Department of Mineral Resources and Energy (DMRE)
Department of Environment, Forestry and Fisheries (DEFF)
Department of Agriculture, Rural Development and Land Reform (DARDLR)
Department of Human Settlement, Water and Sanitation (DHSWS)
Government Bodies and State-Owned Companies
Eskom Holdings SOC Limited
National Energy Regulator of South Africa (NERSA)
South African Civil Aviation Authority (CAA)
South African Heritage Resources Agency (SAHRA)
South African National Roads Agency Limited (SANRAL)
Telkom SA SOC Limited
Provincial Government Departments
Northern Cape Department of Agriculture, Environmental Affairs, Rural Development and Land Reform (DAEARD & LR)
Northern Cape Department of Roads and Public Works
Ngwao Boswa Kapa Bokone (NBKB)
Local Government Departments
John Taolo Gaetsewe District Municipality
Gamagara Local Municipality
Key Stakeholders
BirdLife South Africa
Endangered Wildlife Trust (EWT)
Landowners
Affected landowners, tenants and occupiers
Neighbouring landowners, tenants and occupiers

As per Regulation 42 of the EIA Regulations, 2014 (as amended), all relevant stakeholder and I&AP information has been recorded within a register of I&APs (refer to **Appendix C1** for a listing of the recorded parties). In addition to the above-mentioned EIA Regulations, point 4.1 of the Public Participation Guidelines has also been followed. The register of I&APs contains the names of⁴:

⁴ Contact details and addresses have not been included in the I&AP database as this information is protected by the Protection of Personal Information Act (Act No. 4 of 2013).

- » all persons who requested to be registered on the database using the online stakeholder engagement platform or in writing and disclosed their interest in the project; and
- » all Organs of State which hold jurisdiction in respect of the activity to which the application relates; and all persons who submitted written comments or attended virtual meetings and viewed the narrated presentations on the Savannah Environmental online platform during the public participation process.

I&APs have been encouraged to register their interest in the BA process from the onset of the project, and the identification and registration of I&APs will be on-going for the duration of the BA process. The database of I&APs will be updated throughout the BA process and will act as a record of the I&APs involved in the public participation process.

ii. Advertisements and Notifications

- 40.(2)(a) Fixing a notice board at a place conspicuous to and accessible by the public at the boundary, on the fence or along the corridor of –
- (i) The site where the activity to which the application or proposed application relates is or is to be undertaken; and
 - (ii) Any alternative site.
- 40.(2)(b) Giving written notice, in any of the manners provided for in section 47D⁵ of the Act, to –
- (i) The occupiers of the site and, if the proponent or applicant is not the owner or person in control of the site on which the activity is to be undertaken, the owner or person in control of the site where the activity is or is to be undertaken and to any alternative site where the activity is to be undertaken;
 - (ii) Owners, persons in control of, and occupiers of land adjacent to the site where the activity is or is to be undertaken and to any alternative site where the activity is to be undertaken;
 - (iii) The municipal councillor of the ward in which the site and alternative site is situated and any organisation of ratepayers that represent the community in the area;
 - (iv) The municipality which has jurisdiction in the area;
 - (v) Any organ of state having jurisdiction in respect of any aspect of the activity; and
 - (vi) Any other party as required by the competent authority.
- 40.(2)(c) Placing an advertisement in –
- (i) One local newspaper; or
 - (ii) Any official Gazette that is published specifically for the purpose of providing public notice of applications or other submissions made in terms of these Regulations;

⁵ Section 47D of NEMA pertains to the delivery of documents, and states that:

- (1) A notice or other document in terms of this Act or a specific environmental management Act may be issued to a person –
- (a) By delivering it by hand;
 - (b) By sending it by registered mail –
 - (i) To that person's business or residential address; or
 - (ii) In the case of a juristic person, to its registered address or principal place of business;
 - (bA) By faxing a copy of the notice or other document to the person, if the person has a fax number;
 - (bB) By e-mailing a copy of the notice or other document to the person, if the person has an e-mail address; or
 - (bC) By posting a copy of the notice or other document to the person by ordinary mail, if the person has a postal address;
 - (c) Where an address is unknown despite reasonable enquiry, by publishing it once in the Gazette and once in a local newspaper circulating in the area of that person's last known residential or business address.
- (2) A notice or other document issued in terms of subsection (1)(b), (bA), (bB), (bC) or (c) must be regarded as having come to the notice of the person, unless the contrary is proved."

- 40.(2)(d) Placing an advertisement in at least one provincial newspaper or national newspaper, if the activity has or may have an impact that extends beyond the boundaries of the metropolitan or district municipality in which it is or will be undertaken: Provided that this paragraph need not be complied with if an advertisement has been placed in an official Gazette referred to in paragraph (c)(ii); and
- 40.(2)(e) Using reasonable alternative methods, as agreed to by the competent authority, in those instances where a person is desirous of but unable to participate in the process due to –
- (i) Illiteracy;
 - (ii) Disability; or
 - (iii) Any other disadvantage.

The BA process was announced with an invitation to the Organs of State, potentially affected and neighbouring landowners and general public to register as I&APs and to actively participate in the process. This was achieved via the following:

- » Compilation of a background information document (BID) (refer to **Appendix C2**) providing technical details on the project and how I&APs can become involved in the BA process. The BID was made available on the Savannah Environmental website (<http://www.savannahsa.com/public-documents/energy-generation>), and was distributed via email on **15 October 2020** together with a process notification letter (refer to **Appendix C**)the.
- » Placement of site notices announcing the BA process at visible points at the start of the power line route on **01 October 2020**. Photographs and the GPS co-ordinates of the site notices are contained in **Appendix C3** of the BA Report.
- » Placement of an advertisement in the Kathu Gazette on **23 October 2020** at the commencement of the 30-day review and comment period. This advert announced the project, the BA process, the details regarding the availability of the BA report on the Savannah Environmental website, as well as details on how to submit comments to the project team. A copy of the newspaper advert as sent to the newspaper, as well as the tearsheet is included in **Appendix C2** of the BA Report.

iii. **Public Involvement and Consultation**

In order to accommodate the varying needs of stakeholders and I&APs within the greater study area, as well as capture their views, comments, issues and concerns regarding the project, various opportunities have been and will continue to be provided to I&APs to note their comments and issues. I&APs are being consulted through the following means:

- » **Focus group meetings:** Virtual focus group meetings will be held with key government departments, stakeholders and landowners during the scoping phase of the process. The purpose of these focus group meetings is to introduce the project and EIA process, to facilitate comments on the EIA process and Basic Assessment Report, as well as to record any issues or concerns raised by stakeholders regarding the project. As per the approved public participation plan, these meetings will be held via virtual platform. The minutes of these meetings will be included in the final BA Report for review and acceptance by the DEFF.
- » **One-on-one consultation meetings** for example with directly affected or surrounding landowners. As per the approved public participation plan, these meetings will be held via virtual platform.
- » **Telephonic** consultation sessions.
- » Written, faxed or e-mail correspondence.

All comments received during the 30-day review period will be included in **Appendix C6** and minutes of all meetings held during the review period will be included in **Appendix C7** within the Final BA report.

Table 5.3: Consultation undertaken to date with I&APs for establishment of the Hyperion-Kalbas 132kV power line

Activity	Date
Distribution of the process notification, Background Information Document (BID) and stakeholder reply form announcing the BA process and inviting I&APs to register on the project database. The BID, notification letter, and electronic reply form was also made available on the virtual platform.	15 October 2020
Placement of site notices on-site and at municipal buildings.	1 October 2020
Advertising of the availability of the BA Report for a 30-day review period in Kathu Gazette newspaper.	23 October 2020
Distribution of notification letters announcing the availability of the BA Report for a 30-day review and comment period. These letters were distributed to Organs of State, Government Departments, Ward Councillors, landowners within the surrounding area (including neighbouring landowners), registered I&APs and key stakeholder groups.	27 October 2020
30-day review and comment period of the BA Report.	27 October - 26 November 2020
Virtual Meetings through virtual presentations on the Savannah Environmental Virtual Platform: <ul style="list-style-type: none"> » Registered I&APs making use of the online platform » Adjacent Landowners Authorities and key stakeholders (including Organs of State, local municipality and community-based organisations. Where an I&AP does not have access to a computer and/or internet to view the virtual presentation telephonic discussions will be set-up to provide the presentation electronically with the discussion being recorded and minuted for inclusion. The preferred language of the I&AP has been considered when setting up these discussions.	To be undertaken during the 30-day review period
On-going consultation (i.e. telephone liaison; e-mail communication) with all I&APs	Throughout BA Report 30-day review period

iv. Registered I&APs entitled to Comment on the BA Report

- 43.(1) A registered I&AP is entitled to comment, in writing, on all reports or plans submitted to such party during the public participation process contemplated in these Regulations and to bring to the attention of the proponent or applicant any issues which that party believes may be of significance to the consideration of the application, provided that the interested and affected party discloses any direct business, financial, personal or other interest which that party may have in the approval or refusal of the application.
- (2) In order to give effect to section 24O of the Act, any State department that administers a law relating to a matter affecting the environment must be requested, subject to regulation 7(2), to comment within 30 days.

- 44.(1) The applicant must ensure that the comments of interested and affected parties are recorded in reports and plans and that such written comments, including responses to such comments and records of meetings, are attached to the reports and plans that are submitted to the competent authority in terms of these Regulations.
- (2) Where a person desires but is unable to access written comments as contemplated in subregulation (1) due to –
- (a) A lack of skills to read or write;
 - (b) Disability; or
 - (c) Any other disadvantage;
- Reasonable alternative methods of recording comments must be provided for.

The BA Report has been made available for review by I&APs for a 30-day review and comment period from **27 October 2020** to **26 November 2020**. The BA Report is available for download on Savannah Environmental's website and will be provided in electronic format to stakeholders and I&APs via appropriate electronic means on request. Where hard copies are requested, these will be provided only where sanitary conditions can be maintained. This is in line with the approved Public Participation Plan.

I&APs registered on the database have been notified by means of a notification letter via e-mail of the release of the BA Report for a 30-day review and comment period, invited to provide comment on the BA Report, and informed of the manner in which, and timeframe within which such comment must be made. In addition, the availability of the report was advertised in the local newspaper and on local radio stations (as detailed in the sections above). Proof of distribution of the BA Report will be included in the final BA Report, which will be submitted to the DEFF.

I&APs are able to provide comment via the online stakeholder engagement platform, e-mail, fax, telephone or post. All comments received will be recorded and included in **Appendix C8** of the Final BA Report.

v. Identification and Recording of Comments

Comments raised by I&APs over the duration of the BA process will be synthesised into a Comments and Responses (C&R) Report which is included in **Appendix C8** of the BA Report. The C&R Report will include responses from members of the EIA project team and/or the project proponent to the comments submitted during the public participation process.

Notes of all the telephonic discussions held and minutes of virtual meetings conducted during the 30-day review and comment period of the BA Report will be included in **Appendix C7** of the final BA Report.

4.4 Assessment of Issues Identified through the BA Process

In terms of GN R960 (promulgated on 5 July 2019) and Regulation 16(1)(b)(v) of the 2014 EIA Regulations (as amended), the submission of a Screening Report generated from the national web based environmental screening tool is compulsory for the submission of applications in terms of Regulation 19 and 21 of the 2014 EIA Regulations.

The requirement for the submission of a Screening Report (**Appendix L**) for the proposed development is applicable as it triggers Regulation 19 of the 2014 EIA Regulations (as amended). **Table 4.5** provides a summary

of the specialist assessment requirements identified for the project site in terms of the screening tool and responses to each assessment requirement based on the nature and extent of the project.

Table 4.5: Sensitivity ratings from the DEFF web-based online Screening Tool associated with the establishment of the Hyperion-Kalbas 132kV powerline.

Specialist Assessment	Sensitivity Rating as per the Screening Tool (relating to the need for the study)	Project Team Response
Agricultural Impact Assessment	Medium	A Soils and Agricultural Compliance Statement has been undertaken and included as Appendix E of the BA Report.
Landscape/Visual Impact Assessment	Screening Report did not include a rating for this theme	Given the nature of the proposed 132kV overhead power line a Visual Impact Assessment has been included in this BA Report as Appendix G
Archaeological and Cultural Heritage Impact Assessment	Screening Report did not include a rating for this theme	A Heritage Impact Assessment (which considers the impact on both archaeological and cultural aspects of the study area and the development area) has been undertaken for the project and is included in this BA Report as Appendix E .
Palaeontology Impact Assessment	Medium	The Heritage Impact Assessment (included as Appendix E of the BA Report) includes an assessment of the potential impact on palaeontological resources within the study and development areas
Terrestrial Biodiversity Impact Assessment	Very High	An Ecological Impact Assessment (including consideration of flora and fauna) has been undertaken for the proposed power line and is included as Appendix D of the BA Report.
Aquatic Biodiversity Impact Assessment	Very High	An Aquatic Impact Assessment has been undertaken for the power line and is included as Appendix F of the BA Report.
Avian Impact Assessment	Screening Report did not include a rating for this theme	Given the nature of the proposed 132kV power line infrastructure an Avian Assessment is included as part of the Ecological Assessment included in Appendix D of the BA Report
Civil Aviation Assessment	High	The proposed development is located 5.5km to the north-east of the Sishen Airport. Comment from the Civil Aviation Authority (CAA) will be obtained during the BA process to determine any specific impacts or requirements.
Defence Assessment	Low	The proposed study area and development area is not located within the vicinity of any military bases. No further study in this regard is therefore required.
Geotechnical Assessment	Screening Report did not include a rating for this theme; however, the specialist assessment was	A Geotechnical Assessment of the development area will be undertaken by the proponent as part of the final design and planning process.

Specialist Assessment	Sensitivity Rating as per the Screening Tool (relating to the need for the study)	Project Team Response
	identified as required prior to commencement of the activity.	
Socio-Economic Assessment	Screening Report did not include a rating for this theme; however, the specialist assessment was identified.	A Social Impact Assessment has been undertaken as part of the BA process and included as Appendix I
Plant Species Assessment	Low	An Ecological Impact Assessment (including flora and fauna) has been undertaken for the proposed power line and is included as Appendix D of the BA Report.
Animal Species Assessment	Low	

Based on the results of the screening, and from experience on similar projects and in the study area, the BA project team has identified the following issues as requiring investigation.

Table 4.6: Issues identified for investigation and specialist consultants appointed to evaluate the potential impacts associated with the Hyperion-Kalbas 132kV power line

Issue/Assessment	Specialist Name	Specialist Company	Appendices
Ecology Impact Assessment.	Chris Hooton	Scientific Terrestrial Services	Appendix D
Aquatic Assessment	Stephen van Staden	Scientific Aquatic Services	Appendix F
Soil Impact Assessment	Andrew Husted	Biodiversity Company	Appendix G
Heritage and Archaeological Impact Assessment	Jayson Orton	ASHA Consulting	Appendix E
Visual Impact Assessment	Lourens du Plessis	LOGIS	Appendix H
Social Impact Assessment	Dr Neville Bews	Dr Neville Bews and Associates	Appendix I

Specialist studies considered direct and indirect environmental impacts associated with the development of power line infrastructure. Issues were assessed in terms of the following criteria:

- » The **nature**, a description of what causes the effect, what will be affected, and how it will be affected;
- » The **extent**, wherein it is indicated whether the impact will be local (limited to the immediate area or site of development), regional, national or international. A score of between 1 and 5 is assigned as appropriate (with a score of 1 being low and a score of 5 being high);
- » The **duration**, wherein it is indicated whether:
 - * The lifetime of the impact will be of a very short duration (0–1 years) – assigned a score of 1;
 - * The lifetime of the impact will be of a short duration (2-5 years) - assigned a score of 2;
 - * Medium-term (5–15 years) – assigned a score of 3;
 - * Long term (> 15 years) - assigned a score of 4;
 - * Permanent - assigned a score of 5.
- » The **magnitude**, quantified on a scale from 0-10, where a score is assigned:
 - * 0 is small and will have no effect on the environment;

- * 2 is minor and will not result in an impact on processes;
 - * 4 is low and will cause a slight impact on processes;
 - * 6 is moderate and will result in processes continuing but in a modified way;
 - * 8 is high (processes are altered to the extent that they temporarily cease);
 - * 10 is very high and results in complete destruction of patterns and permanent cessation of processes.
- » The **probability of occurrence**, which describes the likelihood of the impact actually occurring. Probability is estimated on a scale, and a score assigned:
- * Assigned a score of 1–5, where 1 is very improbable (probably will not happen);
 - * Assigned a score of 2 is improbable (some possibility, but low likelihood);
 - * Assigned a score of 3 is probable (distinct possibility);
 - * Assigned a score of 4 is highly probable (most likely);
 - * Assigned a score of 5 is definite (impact will occur regardless of any prevention measures).
- » The **significance**, which is determined through a synthesis of the characteristics described above (refer formula below) and can be assessed as low, medium or high;
- » The **status**, which is described as either positive, negative or neutral;
- » The degree to which the impact can be reversed;
- » The degree to which the impact may cause irreplaceable loss of resources;
- » The degree to which the impact can be mitigated.

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

$S = (E+D+M) P$; where

S = Significance weighting.

E = Extent.

D = Duration.

M = Magnitude.

P = Probability.

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

- » **< 30 points:** Low (i.e. where this impact would not have a direct influence on the decision to develop in the area);
- » **30-60 points:** Medium (i.e. where the impact could influence the decision to develop in the area unless it is effectively mitigated);
- » **> 60 points:** High (i.e. where the impact must have an influence on the decision process to develop in the area).

As the Applicant has the responsibility to avoid or minimise impacts and plan for their management (in terms of the EIA Regulations, 2014 (as amended)), the mitigation of significant impacts is discussed. Assessment of impacts with mitigation is made in order to demonstrate the effectiveness of the proposed mitigation measures. An Environmental Management Programme (EMPr) is included as **Appendix K**.

4.5 Assumptions and Limitations of the BA Process

The following assumptions and limitations are applicable to the studies undertaken within this BA process:

- » All information provided by the developer and I&APs to the environmental team was correct and valid at the time it was provided.
- » It is assumed that the development footprint for power line identified by the developer represents a technically suitable site which is based on the design undertaken by technical consultants for the project.
- » This report and its investigations are project-specific, and consequently the environmental team did not evaluate any other power generation alternatives.

Refer to the specialist studies in **Appendices D – I** for specialist study specific limitations.

4.6 Legislation and Guidelines that have informed the preparation of this Basic Assessment Report

The following legislation and guidelines have informed the scope and content of this BA Report:

- » National Environmental Management Act (Act No. 107 of 1998);
- » EIA Regulations of December 2014, published under Chapter 5 of NEMA (as amended in GNR R326 in Government Gazette No 40772 of April 2017);
- » Department of Environmental Affairs (2017), Public Participation guidelines in terms of NEMA EIA Regulations;
- » Procedures for the assessment and minimum criteria for reporting on identified environmental themes in terms of sections 24(5)(a) and (h) and 44 of the National Environmental Management Act, 1998, when applying for environmental authorisation; and
- » International guidelines – the Equator Principles, the IFC Performance Standards, the Sustainable Development Goals, World Bank Environmental and Social Framework, and the and World Bank Group Environmental, Health, and Safety Guidelines (EHS Guidelines).

Table 4.7 provides an outline of the legislative permitting requirements applicable to the Hyperion-Kalbas 132kV power line as identified at this stage in the project process.

Table 4.7: Applicable Legislation, Policies and/or Guidelines associated with the establishment of the Hyperion-Kalbas 132kV power line

Legislation	Applicable Requirements	Relevant Authority	Compliance Requirements
National Legislation			
Constitution of the Republic of South Africa (No. 108 of 1996)	<p>In terms of Section 24, the State has an obligation to give effect to the environmental right. The environmental right states that:</p> <p><i>“Everyone has the right –</i></p> <ul style="list-style-type: none"> » <i>To an environment that is not harmful to their health or well-being, and</i> » <i>To have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that:</i> <ul style="list-style-type: none"> * <i>Prevent pollution and ecological degradation,</i> * <i>Promote conservation, and</i> * <i>Secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.”</i> 	Applicable to all authorities	There are no permitting requirements associated with this Act. The application of the Environmental Right however implies that environmental impacts associated with proposed developments are considered separately and cumulatively. It is also important to note that the “right to an environment clause” includes the notion that justifiable economic and social development should be promoted, through the use of natural resources and ecologically sustainable development.
National Environmental Management Act (No 107 of 1998) (NEMA)	<p>The 2014 EIA Regulations have been promulgated in terms of Chapter 5 of NEMA. Listed activities which may not commence without EA are identified within the Listing Notices (GNR 327, GNR 325 and GNR 324) which form part of these Regulations (GNR 326).</p> <p>In terms of Section 24(1) of NEMA, the potential impact on the environment associated with these listed activities must be assessed and reported on to the competent authority charged by NEMA with granting of the relevant environmental authorisation.</p> <p>Considering the location of the project site within the Cookhouse Renewable Energy Development Zone (REDZ 3) and the requirements GNR114 of 16 February 2018, a Basic Assessment Process is required to be undertaken for the proposed project. All relevant listing notices for the</p>	<p>DEFF – Competent Authority</p> <p>Northern Cape (DAEAR&DLR) – Commenting Authority</p>	The listed activities triggered by the proposed project have been identified and are being assessed as part of the BA process currently underway for the project. The BA process will culminate in the submission of a final BA Report to the competent in support of the application for EA.

Legislation	Applicable Requirements	Relevant Authority	Compliance Requirements
	project (GN R327, GN R325 and GN R324) will be applied for		
National Environmental Management Act (No 107 of 1998) (NEMA)	<p>In terms of the "Duty of Care and Remediation of Environmental Damage" provision in Section 28(1) of NEMA every person who causes, has caused or may cause significant pollution or degradation of the environment must take reasonable measures to prevent such pollution or degradation from occurring, continuing or recurring, or, in so far as such harm to the environment is authorised by law or cannot reasonably be avoided or stopped, to minimise and rectify such pollution or degradation of the environment.</p> <p>In terms of NEMA, it is the legal duty of a project proponent to consider a project holistically, and to consider the cumulative effect of a variety of impacts.</p>	DEFF Northern Cape (DAEAR&DLR)	While no permitting or licensing requirements arise directly by virtue of the proposed project, this section finds application through the consideration of potential cumulative, direct, and indirect impacts. It will continue to apply throughout the life cycle of the project.
Environment Conservation Act (No. 73 of 1989) (ECA)	<p>The Noise Control Regulations in terms of Section 25 of the ECA contain regulations applicable for the control of noise in the Provinces of Limpopo, North West, Mpumalanga, Northern Cape, Eastern Cape, and KwaZulu-Natal Provinces.</p> <p>The Noise Control Regulations cover the powers of a local authority, general prohibitions, prohibitions of disturbing noise, prohibitions of noise nuisance, use of measuring instruments, exemptions, attachments, and penalties.</p> <p>In terms of the Noise Control Regulations, no person shall make, produce or cause a disturbing noise, or allow it to be made, produced or caused by any person, machine, device or apparatus or any combination thereof (Regulation 04).</p>	DEFF Northern Cape (DAEAR&DLR) Gamagara Local Municipality	Noise impacts are expected to be associated with the construction phase of the project. As the site is located a great distance from noise sensitive receptors and communities, construction noise is unlikely to present a significant intrusion to the local community. There is therefore no requirement for a noise permit in terms of the legislation.
National Water Act (No. 36 of 1998) (NWA)	A water use listed under Section 21 of the NWA must be licensed with the Regional DWS, unless it is listed in	Regional Department of	Pans and wetlands are present in the area surrounding the project

Legislation	Applicable Requirements	Relevant Authority	Compliance Requirements
	<p>Schedule 1 of the NWA (i.e. is an existing lawful use), is permissible under a GA, or if a responsible authority waives the need for a licence.</p> <p>Water use is defined broadly, and includes consumptive and non-consumptive water uses, taking and storing water, activities which reduce stream flow, waste discharges and disposals, controlled activities (activities which impact detrimentally on a water resource), altering a watercourse, removing water found underground for certain purposes, and recreation.</p> <p>Consumptive water uses may include taking water from a water resource (Section 21 (a)), and storing water (Section 21 (b)).</p> <p>Non-consumptive water uses may include impeding or diverting of flow in a water course (Section 21 (c)), and altering of bed, banks or characteristics of a watercourse (Section 21 (i)).</p>	<p>Human Settlements, Water and Sanitation</p>	<p>development footprint as identified within the Freshwater Impact Assessment (Appendix F). No direct impacts on these pans and wetlands is associated with the project.</p> <p>Where development activities impede into the 500m regulated area around these pans and wetlands, Section 21 (c) and 21 (i) of the NWA would be triggered, and the project proponent would need to apply for a WUL or register a GA with the DWS.</p>
<p>Minerals and Petroleum Resources Development Act (No. 28 of 2002) (MPRDA)</p>	<p>In accordance with the provisions of the MPRDA a mining permit is required in accordance with Section 27(6) of the Act where a mineral in question is to be mined, including the mining of materials from a borrow pit.</p> <p>Section 53 of the MPRDA states that any person who intends to use the surface of any land in any way which may be contrary to any object of the Act, or which is likely to impede any such object must apply to the Minister for approval in the prescribed manner.</p>	<p>Department of Mineral Resources and Energy</p>	<p>Any person who wishes to apply for a mining permit in accordance with Section 27(6) must simultaneously apply for an Environmental Authorisation in terms of NEMA. No borrow pits are expected to be required for the construction of the project, and as a result a mining permit or EA is not required to be obtained.</p> <p>In terms of Section 53 of the MPRDA approval is required from the Minister of Mineral Resources to ensure that the proposed development does not sterilise</p>

Legislation	Applicable Requirements	Relevant Authority	Compliance Requirements
<p>National Environmental Management: Air Quality Act (No. 39 of 2004) (NEM:AQA)</p>	<p>The National Dust Control Regulations (GNR 827) published under Section 32 of NEM:AQA prescribe the general measures for the control of dust in all areas, and provide a standard for acceptable dustfall rates for residential and non-residential areas.</p> <p>In accordance with the Regulations (GNR 827) any person who conducts any activity in such a way as to give rise to dust in quantities and concentrations that may exceed the dustfall standard set out in Regulation 03 must, upon receipt of a notice from the air quality officer, implement a dustfall monitoring programme.</p> <p>Any person who has exceeded the dustfall standard set out in Regulation 03 must, within three months after submission of the dustfall monitoring report, develop and submit a dust management plan to the air quality officer for approval.</p>	<p>Northern Cape (DAEAR&DLR / John Taolo Gaetsewe District Municipality</p>	<p>a mineral resource that might occur on site.</p> <p>In the event that the project results in the generation of excessive levels of dust the possibility could exist that a dustfall monitoring programme would be required for the project, in which case dustfall monitoring results from the dustfall monitoring programme would need to be included in a dust monitoring report, and a dust management plan would need to be developed. However, with mitigation measures implemented, the proposed project is not anticipated to result in significant dust generation.</p>
<p>National Heritage Resources Act (No. 25 of 1999) (NHRA)</p>	<p>Section 07 of the NHRA stipulates assessment criteria and categories of heritage resources according to their significance.</p> <p>Section 35 of the NHRA provides for the protection of all archaeological and palaeontological sites, and meteorites.</p> <p>Section 36 of the NHRA provides for the conservation and care of cemeteries and graves by SAHRA where this is not the responsibility of any other authority.</p> <p>Section 38 of the NHRA lists activities which require developers or any person who intends to undertake a</p>	<p>South African Heritage Resources Agency</p> <p>Ngwao Boswa Kapa Bokone (NBKB)</p>	<p>A full Heritage Impact Assessment (HIA) and Archaeological Impact Assessment (with field work) has been undertaken as part of the BA process (refer to Appendix E of this BA Report).</p> <p>Should a heritage resource be impacted upon, a permit may be required from SAHRA in accordance with of Section 48 of the NHRA, and the SAHRA Permit Regulations (GNR 668). This will be determined once the final location of the development footprint and its associated</p>

Legislation	Applicable Requirements	Relevant Authority	Compliance Requirements
	<p>listed activity to notify the responsible heritage resources authority and furnish it with details regarding the location, nature, and extent of the proposed development.</p> <p>Section 44 of the NHRA requires the compilation of a Conservation Management Plan as well as a permit from SAHRA for the presentation of archaeological sites as part of tourism attraction.</p>		<p>infrastructure within the development area has been determined.</p>
<p>National Environmental Management: Biodiversity Act (No. 10 of 2004) (NEM:BA)</p>	<p>Section 53 of NEM:BA provides for the MEC / Minister to identify any process or activity in such a listed ecosystem as a threatening process.</p> <p>Three government notices have been published in terms of Section 56(1) of NEM:BA as follows:</p> <ul style="list-style-type: none"> » Commencement of TOPS Regulations, 2007 (GNR 150). » Lists of critically endangered, vulnerable and protected species (GNR 151). » TOPS Regulations (GNR 152). <p>It provides for listing threatened or protected ecosystems, in one of four categories: critically endangered (CR), endangered (EN), and vulnerable (VU) or protected. The first national list of threatened terrestrial ecosystems has been gazetted, together with supporting information on the listing process including the purpose and rationale for listing ecosystems, the criteria used to identify listed ecosystems, the implications of listing ecosystems, and summary statistics and national maps of listed ecosystems (NEM:BA: National list of ecosystems that are threatened and in need of protection, (Government Gazette 37596, GNR 324), 29 April 2014).</p>	<p>DEFF Northern Cape (DAEAR&DLR)</p>	<p>Under NEM:BA, a permit would be required for any activity which is of a nature that may negatively impact on the survival of a listed protected species.</p>

Legislation	Applicable Requirements	Relevant Authority	Compliance Requirements
<p>National Environmental Management: Biodiversity Act (No. 10 of 2004) (NEM:BA)</p>	<p>Chapter 5 of NEM:BA pertains to alien and invasive species, and states that a person may not carry out a restricted activity involving a specimen of an alien species without a permit issued in terms of Chapter 7 of NEM:BA, and that a permit may only be issued after a prescribed assessment of risks and potential impacts on biodiversity is carried out.</p> <p>Applicable, and exempted alien and invasive species are contained within the Alien and Invasive Species List (GNR 864).</p>	<p>DEFF Northern Cape (DAEAR&DLR)</p>	<p>Restricted Activities and the respective requirements applicable to persons in control of different categories of listed invasive species are contained within the Alien and Invasive Species Regulations (GNR 598) published under NEM:BA, together with the requirements of the Risk Assessment to be undertaken.</p>
<p>Conservation of Agricultural Resources Act (No. 43 of 1983) (CARA)</p>	<p>Section 05 of CARA provides for the prohibition of the spreading of weeds.</p> <p>Regulation 15 of GNR 1048 published under CARA provides for the classification of categories of weeds and invader plants, and restrictions in terms of where these species may occur.</p> <p>Regulation 15E of GNR 1048 published under CARA provides requirement and methods to implement control measures for different categories of alien and invasive plant species.</p>	<p>Department of Agriculture, Forestry and Fisheries (DAFF)</p>	<p>In terms of Regulation 15E (GNR 1048) where Category 1, 2 or 3 plants occur a land user is required to control such plants by means of one or more of the following methods:</p> <ul style="list-style-type: none"> » Uprooting, felling, cutting or burning. » Treatment with a weed killer that is registered for use in connection with such plants in accordance with the directions for the use of such a weed killer. » Biological control carried out in accordance with the stipulations of the Agricultural Pests Act (No. 36 of 1983), the ECA and any other applicable legislation. » Any other method of treatment recognised by the executive officer that has as its object the control of plants concerned, subject to the provisions of sub-regulation (4).

Legislation	Applicable Requirements	Relevant Authority	Compliance Requirements
			<p>» A combination of one or more of the methods prescribed, save that biological control reserves and areas where biological control agents are effective shall not be disturbed by other control methods to the extent that the agents are destroyed or become ineffective.</p>
<p>National Forests Act (No. 84 of 1998) (NFA)</p>	<p>According to this Act, the Minister may declare a tree, group of trees, woodland or a species of trees as protected. Notice of the List of Protected Tree Species under the National Forests Act (No. 84 of 1998) was published in GNR 734.</p> <p>The prohibitions provide that “no person may cut, damage, disturb, destroy or remove any protected tree, or collect, remove, transport, export, purchase, sell, donate or in any other manner acquire or dispose of any protected tree, except under a licence granted by the Minister”.</p>	<p>DAFF</p>	<p>A licence is required for the removal of protected trees. It is therefore necessary to conduct a survey that will determine the number and relevant details pertaining to protected tree species present in the development area for the submission of relevant permits to authorities prior to the disturbance of these individuals.</p> <p>The Ecological Impact Assessment undertaken as part of the BA Report included a site visit which allowed for the identification of any protected tree species which may require a license in terms of the NFA within the development area (refer to Appendix D of this BA Report).</p> <p>Protected trees, namely <i>Vachellia erioloba</i> and <i>V. haematoxylon</i> have been recorded within the study area</p>
<p>National Veld and Forest Fire Act (No. 101 of 1998) (NVFFA)</p>	<p>Chapter 4 of the NVFFA places a duty on owners to prepare and maintain firebreaks, the procedure in this regard, and the role of adjoining owners and the fire protection association. Provision is also made for the</p>	<p>DAFF</p>	<p>While no permitting or licensing requirements arise from this legislation, this Act will be applicable during the construction and operation of the</p>

Legislation	Applicable Requirements	Relevant Authority	Compliance Requirements
	<p>making of firebreaks on the international boundary of the Republic of South Africa. The applicant must ensure that firebreaks are wide and long enough to have a reasonable chance of preventing a veldfire from spreading to or from neighbouring land, it does not cause soil erosion, and it is reasonably free of inflammable material capable of carrying a veldfire across it.</p> <p>Chapter 5 of the Act places a duty on all owners to acquire equipment and have available personnel to fight fires. Every owner on whose land a veldfire may start or burn or from whose land it may spread must have such equipment, protective clothing and trained personnel for extinguishing fires, and ensure that in his or her absence responsible persons are present on or near his or her land who, in the event of fire, will extinguish the fire or assist in doing so, and take all reasonable steps to alert the owners of adjoining land and the relevant fire protection association, if any.</p>		<p>proposed infrastructure establishment, in terms of the preparation and maintenance of firebreaks, and the need to provide appropriate equipment and personnel for firefighting purposes.</p>
<p>Hazardous Substances Act (No. 15 of 1973) (HAS)</p>	<p>This Act regulates the control of substances that may cause injury, or ill health, or death due to their toxic, corrosive, irritant, strongly sensitising or inflammable nature or the generation of pressure thereby in certain instances and for the control of certain electronic products. To provide for the rating of such substances or products in relation to the degree of danger, to provide for the prohibition and control of the importation, manufacture, sale, use, operation, modification, disposal or dumping of such substances and products.</p> <p>» Group I and II: Any substance or mixture of a substance that might by reason of its toxic, corrosive etc., nature or because it generates pressure through decomposition, heat or other means, cause extreme</p>	<p>Department of Health (DoH)</p>	<p>It is necessary to identify and list all Group I, II, III, and IV hazardous substances that may be on site and in what operational context they are used, stored or handled. If applicable, a license would be required to be obtained from the Department of Health (DoH).</p>

Legislation	Applicable Requirements	Relevant Authority	Compliance Requirements
	<p>risk of injury etc., can be declared as Group I or Group II substance</p> <ul style="list-style-type: none"> » Group IV: any electronic product, and » Group V: any radioactive material. <p>The use, conveyance, or storage of any hazardous substance (such as distillate fuel) is prohibited without an appropriate license being in force.</p>		
<p>National Environmental Management: Waste Act (No. 59 of 2008) (NEM:WA)</p>	<p>The Minister may by notice in the Gazette publish a list of waste management activities that have, or are likely to have, a detrimental effect on the environment.</p> <p>The Minister may amend the list by –</p> <ul style="list-style-type: none"> » Adding other waste management activities to the list. » Removing waste management activities from the list. » Making other changes to the particulars on the list. <p>In terms of the Regulations published in terms of NEM:WA (GNR 912), a BA or EIA is required to be undertaken for identified listed activities.</p> <p>Any person who stores waste must at least take steps, unless otherwise provided by this Act, to ensure that:</p> <ul style="list-style-type: none"> » The containers in which any waste is stored, are intact and not corroded or in » Any other way rendered unfit for the safe storage of waste. » Adequate measures are taken to prevent accidental spillage or leaking. » The waste cannot be blown away. » Nuisances such as odour, visual impacts and breeding of vectors do not arise, and 	<p>DEFF – hazardous waste</p> <p>Northern Cape (DAEAR&DLR)</p>	<p>No listed activities are triggered by the proposed Hyperion-Kalbas 132kV power line and therefore no Waste Management License is required to be obtained. General and hazardous waste handling, storage and disposal will be required during construction and operation. The National Norms and Standards for the Storage of Waste (GNR 926) published under Section 7(1)(c) of NEM:WA will need to be considered in this regard.</p>

Legislation	Applicable Requirements	Relevant Authority	Compliance Requirements
	» Pollution of the environment and harm to health are prevented.		
National Road Traffic Act (No. 93 of 1996) (NRTA)	<p>The technical recommendations for highways (TRH 11): “Draft Guidelines for Granting of Exemption Permits for the Conveyance of Abnormal Loads and for other Events on Public Roads” outline the rules and conditions which apply to the transport of abnormal loads and vehicles on public roads and the detailed procedures to be followed in applying for exemption permits are described and discussed.</p> <p>Legal axle load limits and the restrictions imposed on abnormally heavy loads are discussed in relation to the damaging effect on road pavements, bridges, and culverts.</p> <p>The general conditions, limitations, and escort requirements for abnormally dimensioned loads and vehicles are also discussed and reference is made to speed restrictions, power/mass ratio, mass distribution, and general operating conditions for abnormal loads and vehicles. Provision is also made for the granting of permits for all other exemptions from the requirements of the National Road Traffic Act and the relevant Regulations.</p>	SANRAL – national roads Northern Cape DoT	An abnormal load / vehicle permit may be required to transport the various components to site for construction. These include route clearances and permits will be required for vehicles carrying abnormally heavy or abnormally dimensioned loads. Transport vehicles exceeding the dimensional limitations (length) of 22m. Depending on the trailer configuration and height when loaded, some of the on-site substation components may not meet specified dimensional limitations (height and width).
Provincial Policies / Legislation			
Northern Cape Nature Conservation Act (Act No. 9 of 2009)	This Act provides for the sustainable utilisation of wild animals, aquatic biota and plants; provides for the implementation of the Convention on International Trade in Endangered Species of Wild Fauna and Flora; provides for offences and penalties for contravention of the Act; provides for the appointment of nature conservators to implement the provisions of the Act; and provides for the issuing of permits and other authorisations. Amongst other	Department of Agriculture, Environmental Affairs, Rural Development and Land Reform	A collection/destruction permit must be obtained from Northern Cape Nature Conservation for the removal of any protected plant or animal species found on site.

Legislation	Applicable Requirements	Relevant Authority	Compliance Requirements
	<p>regulations, the following may apply to the current project:</p> <ul style="list-style-type: none"> » Boundary fences may not be altered in such a way as to prevent wild animals from freely moving onto or off of a property; » Aquatic habitats may not be destroyed or damaged; » The owner of land upon which an invasive species is found (plant or animal) must take the necessary steps to eradicate or destroy such species; <p>The Act provides lists of protected species for the Province.</p>		

CHAPTER 5: DESCRIPTION OF THE RECEIVING ENVIRONMENT

This Chapter provides a description of the environment that may be affected by the establishment of Hyperion-Kalbas 132kV power line. The information is provided in order to assist the reader in understanding the pre-development environment and the possible effects of the project on the environment within which it is proposed to be developed. Aspects of the biophysical and social environments that could be directly or indirectly affected by the development or could affect proposed infrastructure have been described. This information has been sourced from both existing information available for the area as well as collected field data by specialist consultants and aims to provide the context within which this BA process is being conducted.

5.1 Legal Requirements as per the EIA Regulations, 2014 (as amended) for the undertaking of a Basic Assessment Report

This chapter of the BA Report includes the following information required in terms of Appendix 1: Content of the BA Report.

Requirement	Relevant Section
(h)(iv) the environmental attributes associated with the alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects	<p>The environmental attributes associated with the establishment of proposed infrastructure are included within this chapter. The environmental attributes that are assessed within this chapter include the following:</p> <ul style="list-style-type: none"> » The regional and local setting of proposed is described in section 5.2. and section 5.3 » The climatic conditions of Kathu and the study area are included in section 5.4. » Biophysical characteristics of the development area, study area and the surrounding areas are described in section 5.5 to section 5.8. These include landscape features such as, geology, soil and land types and biodiversity (i.e. ecology ((including fauna & flora)) and avifauna) of the area to be affected by the development of the proposed infrastructure » Heritage resources, including the archaeology and palaeontology of the study area and development area are described in section 5.9. » The visual quality of the affected area surrounding the proposed project is described in section 5.10 » Social characteristics of the area surrounding the proposed project is described in section 5.11.

A more detailed description of each aspect of the affected environment is included in the specialist reports contained within **Appendix D – I**.

5.2 Regional Setting

The Northern Cape Province is located in the north-western extent of South Africa and constitutes South Africa's largest province, occupying an area 372 889km² in extent, equivalent to nearly a third (30.5%) of the country's total land mass. It is also South Africa's most sparsely populated province with a population of 1 145 861 people, and a population density of 3.1/km². The capital city is Kimberley, and other important

towns include Upington, Springbok, Kuruman, De Aar, and Sutherland. It is bordered by the Western Cape, and Eastern Cape Provinces to the south, and south-east; Free State, and North West Provinces to the east; Botswana and Namibia, to the north; and the Atlantic Ocean to the west. The Northern Cape is the only South African province which borders Namibia, and therefore plays an important role in terms of providing linkages between Namibia and the rest of South Africa. The Orange River, which is South Africa's largest river, is a significant feature and is also the main source of water in the Province, while also constituting the international border between the Northern Cape and Namibia.

The Northern Cape makes the smallest contribution to South Africa's economy (contributing only 2% to South Africa's Gross Domestic Product per region (GDP-R) in 2007). The Northern Cape is rich in minerals including alluvial diamonds, iron ore, and copper. The province is also rich in asbestos, manganese, fluor spar, semi-precious stones and marble. The mining sector is the largest contributor to the provincial GDP. The Northern Cape's mining industry is of national and international importance, as it produces approximately 37% of South Africa's diamond output, 44% of its zinc, 70% of its silver, 84% of its iron-ore, 93% of its lead and 99% of its manganese. According to the fourth reviewed IDP of the Gamagara LM, the town of Kathu is considered to be the administrative and economic hub of the municipality which is located within the centre of the Gamagara Mining Corridor.

The province has fertile agricultural land in the Orange River Valley, especially at Upington, Kakamas and Keimoes, where grapes and fruit are cultivated intensively. The agricultural sector employs approximately 19.5% of the total formally employed individuals (LED Strategy). The sector is experiencing significant growth in value-added activities, including game-farming, while food production and processing for the local and export market is also growing significantly (PGDS, July 2011). Approximately 96% of the land is used for stock farming, including cattle and sheep or goats, as well as game farming, while approximately 2% of the province is used for crop farming, mainly under irrigation in the Orange River Valley and Vaalharts Irrigation Scheme (LED Strategy).

The Northern Cape offers unique tourism opportunities including wildlife conservation destinations, natural features, historic sites, festivals, cultural sites, stars gazing, adventure tourism, agricultural tourism, ecotourism, game farms, and hunting areas, etc. The Province is home to the Richtersveld Botanical and Landscape World Heritage Site, which comprises a United Nations Educational, Scientific and Cultural Organisation (UNESCO) World Heritage Site under the World Heritage Convention. The Northern Cape is also home to two Transfrontier National Parks, namely the Kgalagadi Transfrontier Park, and the Richtersveld /Ai-Ais Transfrontier Park, as well as five national parks, and six provincial reserves. The Northern Cape also plays a significant role in South Africa's science and technology sector, as it is home to the Square Kilometre Array (SKA), the Southern African Large Telescope (SALT), and the Karoo Array Telescope (MeerKAT).

The Northern Cape comprises five (5) Districts, namely Frances Baard, Johan Taolo Gaetsewe, Namakwa, Pixley Ka Seme, and ZF Mgcawu (refer to **Figure 5.1**).

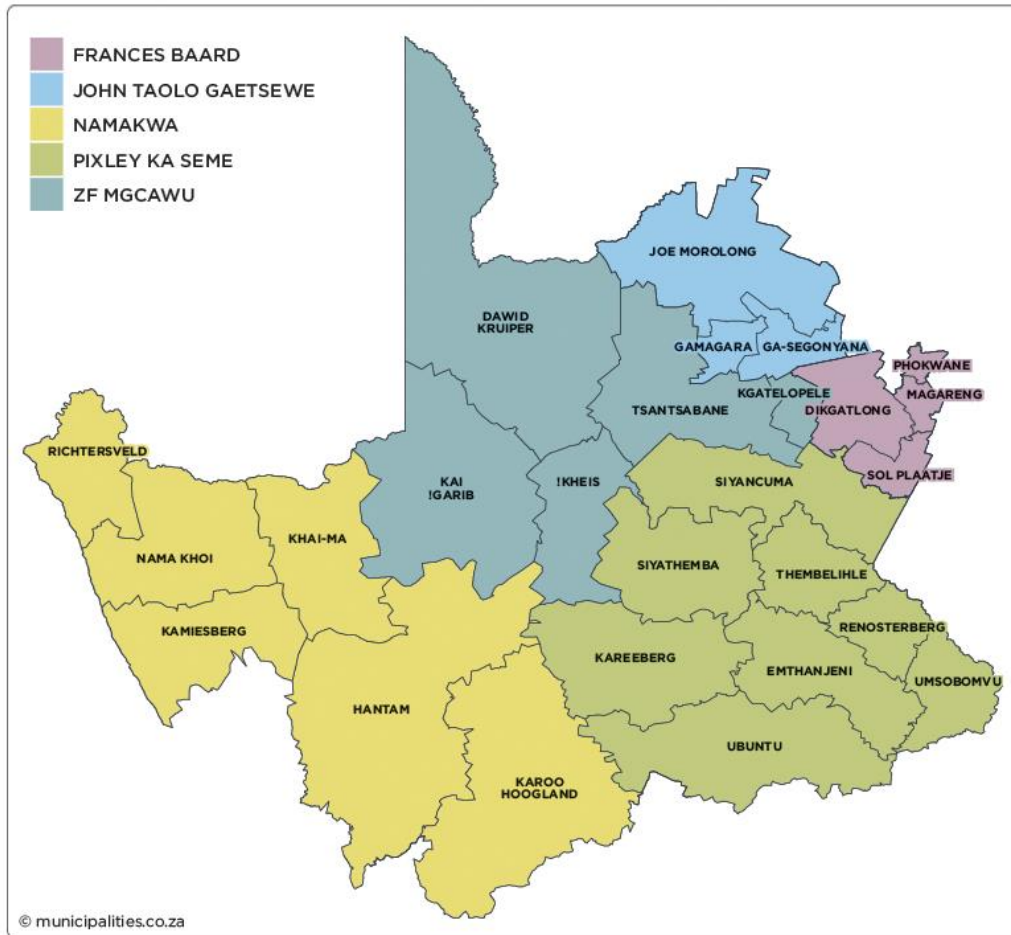


Figure 5.1: Districts of the Northern Cape Province (Source: Municipalities of South Africa).

The John Taolo Gaetsewe DM (previously known as the Kgalagadi DM) is situated in the north-eastern extent of Northern Cape Province, and is bordered by ZF Mgcawu DM to the south-west, and south; Frances Baard DM to the south-east; Dr Ruth Segomotsi Mompati DM of North West Province to the east; and Botswana to the north. It is the second smallest DM in the Province in terms of land mass (27 283km², equivalent to 7.32% of the total Provincial land mass), and third largest in terms of population (224 799, equivalent to 19.62% of the total Provincial population), with the second highest population density of 8.2/km².

The John Taolo Gaetsewe DM comprises 186 towns and settlements, approximately 80% of which includes villages. Predominant towns within the DM include: Bankhara-Bodulong, Deben, Hotazel, Kathu, Kuruman, Mothibistad, Olifantshoek, Santoy, and Van Zylsrus. It is characterised by a mixture of land uses, of which agriculture and mining are dominant. The main economic sectors within the DM include agriculture, mining, and retail. The DM holds potential as a viable tourist destination and has numerous growth opportunities in the industrial sector.

The DM comprises 3 Local Municipalities, namely: Gamagara, Ga-Segonyana, and Joe Morolong Local Municipalities. In 2006 the boundaries of the John Taolo Gaetsewe DM were demarcated to include the once north-western part of Gamagara and Olifantshoek, along with its surrounds, into the Gamagara LM (refer to **Figure 5.2**).



Figure 5.2: Local Municipalities of the John Taolo Gaetsewe District (Source: Municipalities of South Africa).

The Gamagara LM is situated approximately 200km north east of Upington and 280km north west of Kimberley in the southern to south-western extent of the John Taolo Gaetsewe DM. It is bordered by the Gamagara LM to the north, the Ga-Segonyana LM to the east, and the Tsantsabane LM of the ZF Mgcawu DM of the Northern Cape Province to the south and west. The Gamagara LM has the smallest population (41 617) compared to the other LM in the John Taolo Gaetsewe, and is the second most densely populated LM of the John Taolo Gaetsewe DM with a population density of 16/km².

The Gamagara LM comprises five towns, namely: Kathu, Shesheng, Dibeng, Dingleton, and Olifantshoek. Kathu is the largest town and is also the administrative centre of the Gamagara LM. Olifantshoek is the second largest town and is located near the Gamagara River to the north west of Kathu, and Dingleton is the smallest of the five towns, and is located in the centre of the mining activities directly south of Kathu.

5.3 Local Setting and Project Site

The closest town to the proposed development include Kathu, located approximately 15km to the south of the project site. Other towns in proximity of the project site include Dibeng located approximately 18km west of the project site, and Kuruman located approximately 34km north west of the project site. Built infrastructure in the form of farm homesteads and workers quarters occur within and around the project site and may be impacted on (i.e. in terms of nuisance and / or visual impacts) as a result of the proposed project.

Prominent/major road systems within the area include the N14 located approximately 6km south of the project site, the R380 located approximately 9km west of the project site and the R31 located approximately

25km north of the project site. Access to the project site is currently obtained via the T26 gravel road that joins the N14 located south of the project site.

5.4 Climatic Conditions

The Kathu area is typically characterised as having a local steppe climate (BSh) with little rainfall. The area receives a mean annual average rainfall of approximately 395mm. Precipitation is highest in March with an average of 74mm; and lowest in July with an average of 3mm. Minimal rain occurs between May to September. The average annual temperature in Kathu is 18.9°C. January is the hottest month of the year with an average temperature of 25.3°C, while July is the coldest month of the year with an average temperature of 10.8°C (refer to **Figure 5.3**). Frost is frequent to very frequent during winter, with up to 37 mean frost days per year. Droughts and floods are a regular occurrence at both provincial and local scales and play a significant role in almost every aspect of the social, economic, and ecological environment within the Province.

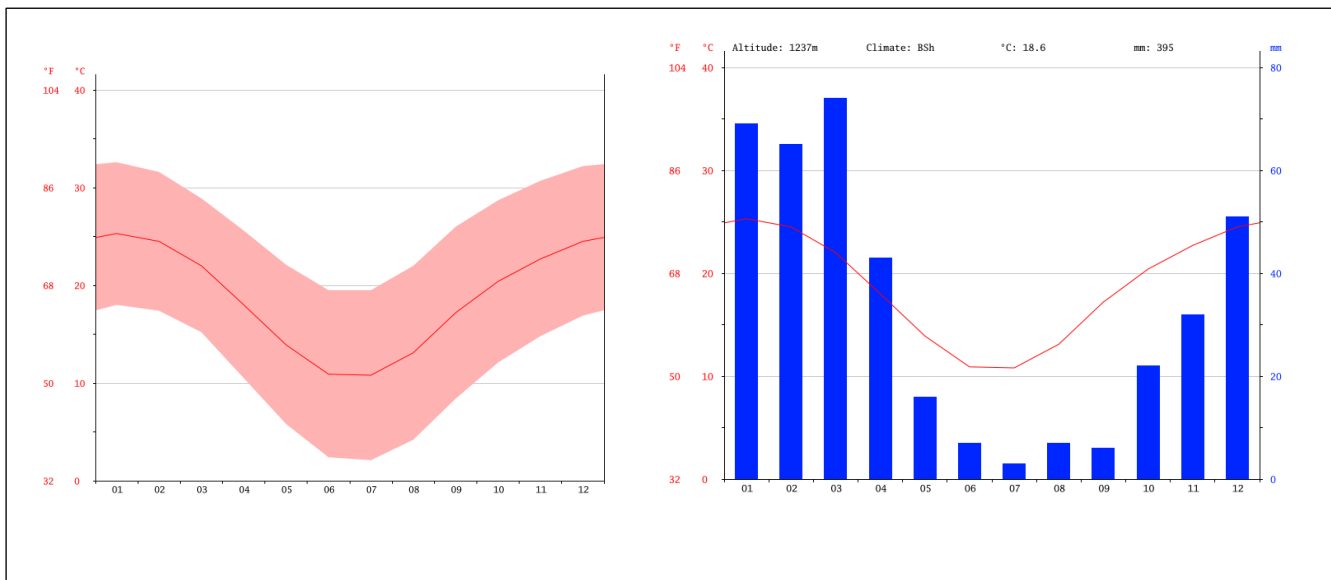


Figure 5.3: Climate and Temperature graphs for Kathu, Northern Cape Province (Source: en.climate-data.org).

5.5 Topography & Land use

The landscape topography of the project area can be described as a uniform, flat topography with no slopes being present. Elevation of the project area ranges from 1 170 to 1 185 meters above sea level (MSAL).

Dominant land use in the area are natural veld and grazing. Renewable energy facilities and infrastructures are also situated within the broader project area.

5.6 Soil, Land Types and Agricultural Potential

Land types associated with the power line corridor are Ag110 and Ah9 (**Figure 5.4 & Figure 5.5**). The Ag land type is characterised by freely drained Red or Yellow-Brown Apedal soils with red soils being dominant. These soils are characterised by a high base status. The Ah land type is characterised by freely drained Red and

Yellow Apedal soils with a high base status. The soils within this land type is characterised by less than 15% clay.

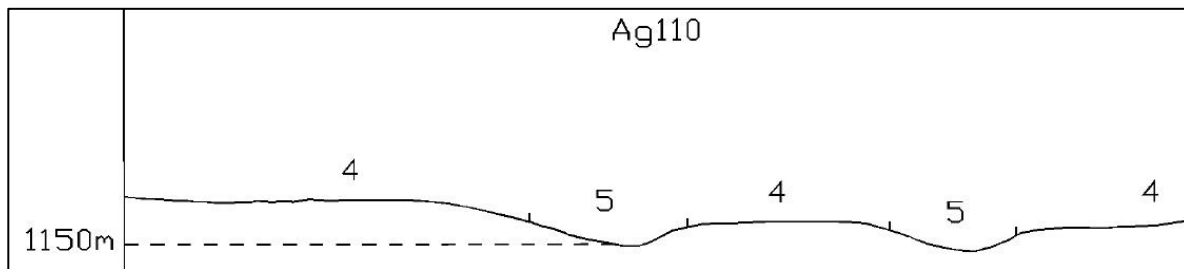


Figure 5.4 Illustration of the Ag 110 land type terrain units (Land Type Survey Staff, 1972 - 2006)

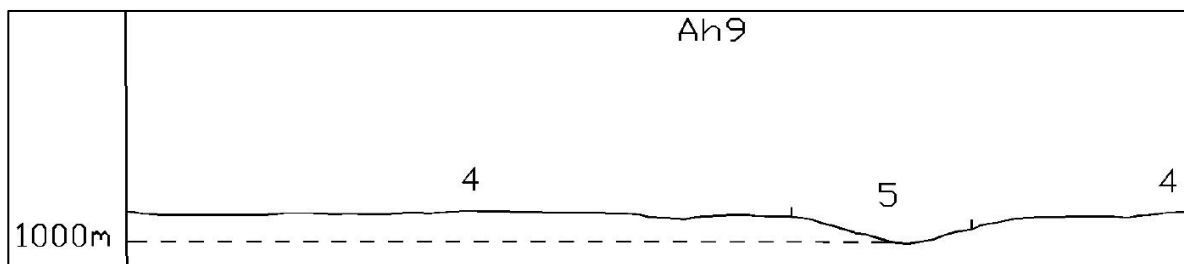


Figure 5.5 Illustration of the Ah 9 land type terrain units (Land Type Survey Staff, 1972 - 2006)

The following soil forms were identified within the power line corridor:

- » Nkonkoni soil form (1122(15)) (Orthic topsoil above a Red Apedal horizon, which in turn is underlain by a Lithic horizon);
- » Glenrosa soil form (1220(15)) (Orthic topsoil on top of a Lithic horizon);
- » Ermelo soil form (1120(15)) (Orthic topsoil on top of a thick Yellow-Brown Apedal horizon); and
- » Hutton soil form (1120(15)) (Orthic topsoil on top of a thick Red Apedal horizon)

The land capability of the abovementioned soils ranges from a land capability of "Good Potential" to a land capability of "Low Potential". Given the low Mean Annual Precipitation (MAP) and the high Mean Annual Potential Evapotranspiration (MAPE) rates, the determined land capabilities and climate capabilities result in a land potential of "Very Restricted Potential" and "Very Low Potential".

5.7 Hydrology and Aquatic Features

The project area is situated in quaternary catchment D41K in the Molopo sub-catchment area within the Lower Vaal Water Management Area (WMA). Several natural and artificial NFEPA wetlands have been identified in the area surrounding the project infrastructure. The prominent watercourse confirmed in the broader study area is the Vlermuisleegte River, which is an episodic river that drains in a south-eastern to north-western direction and is located directly east of the project area. Pans and two cryptic wetlands have also been confirmed near the southern end of the grid corridor (**Figure 5.6**). No watercourses are present in the development footprint of the power line corridor.

All the wetlands identified by the NFEPA (2011) and NBA (2018) databases are considered to be in a natural or good ecological condition (Class AB).

Several cryptic wetlands have been identified within the investigation area and vicinity thereof and classified as watercourses, along with one seasonal depression which does not meet the definition of a watercourse from an ecological perspective. The area surrounding the identified cryptic wetlands is mainly natural, untransformed areas; however, sand mining and various informal roads were identified as the main anthropogenic activities occurring within the local catchment of these wetlands.

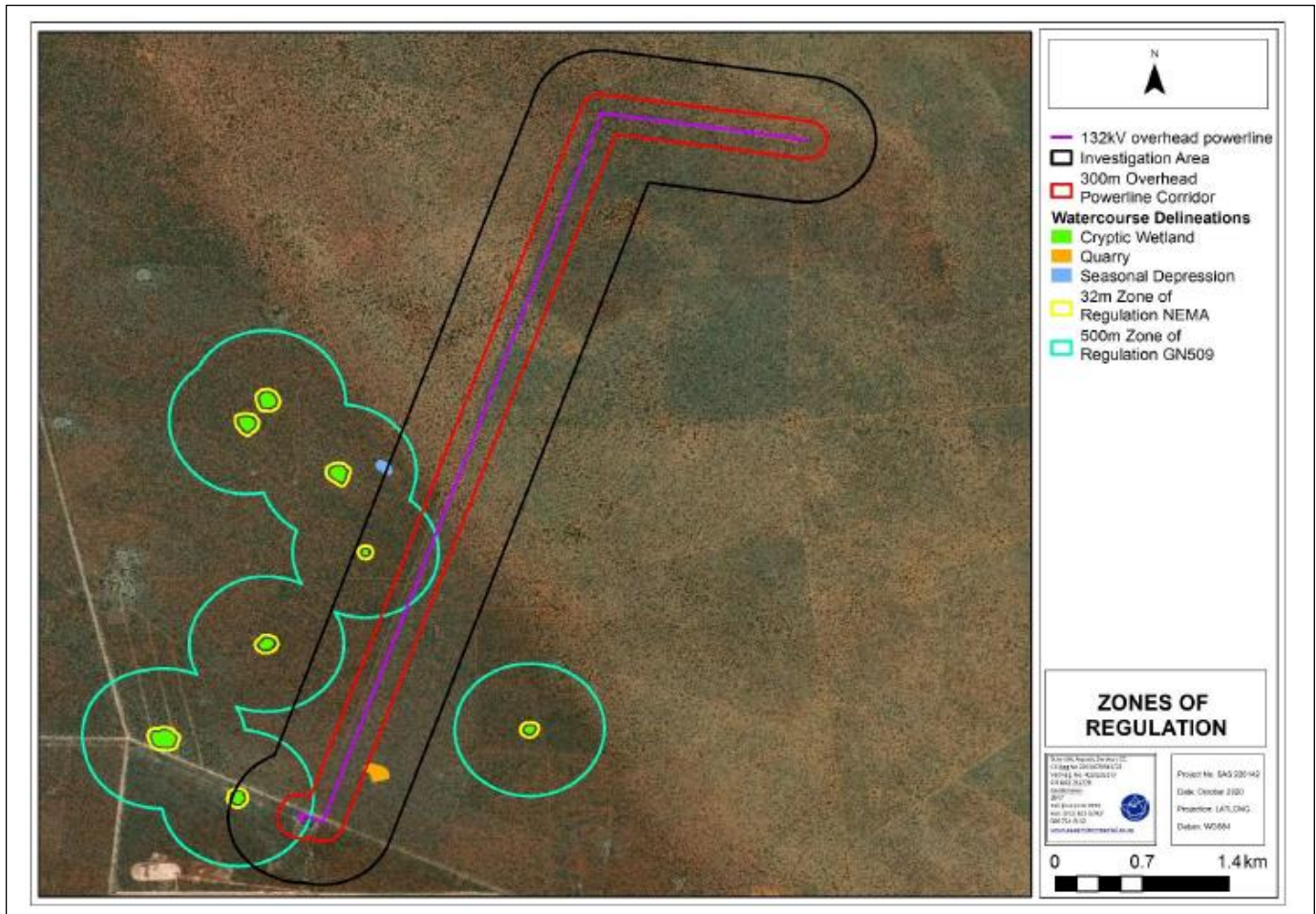


Figure 5.6: Watercourse associated with the project area and Hyperion-Kalbas 132kV powerline

5.8 Ecological Profile of the Study Area and Development Area

5.8.1 Broad-Scale Vegetation Patterns

The project area is situated within the Kathu Bushveld vegetation type, which has a distribution range from Kathu and Dibeng in the south, through Hotazel, vicinity of Frylinckspan to the Botswana border roughly between Van Zylsrus and McCarthysrus. Vegetation and landscape features expected in study area are as follows:

- » Medium-tall tree layer with *Acacia erioloba* in places, but mostly open and including *Boscia albitrunca* as the prominent trees.
- » Shrub layer, which is generally the most notable feature, with *A. mellifera*, *Diospyros lycioides* and *Lycium hirsutum*.
- » Grass layer with variable cover.

Critical Biodiversity Areas (CBAs) and Ecological Support Areas (ESAs)

According to the Northern Cape Critical Biodiversity Areas (2016) database, the project area does not fall within any Critical Biodiversity Areas (CBAs). However, most of the project area falls within an area categorised as Other Natural Areas, although small sections (in both the northeast and the southwest) of the study area fall within Ecological Support Areas (ESAs). ESAs are required to be maintained in an ecologically functional state to support Critical Biodiversity Areas and/or Protected Areas. ESAs maintain the ecological processes on which Critical Biodiversity Areas and Protected Areas depend.

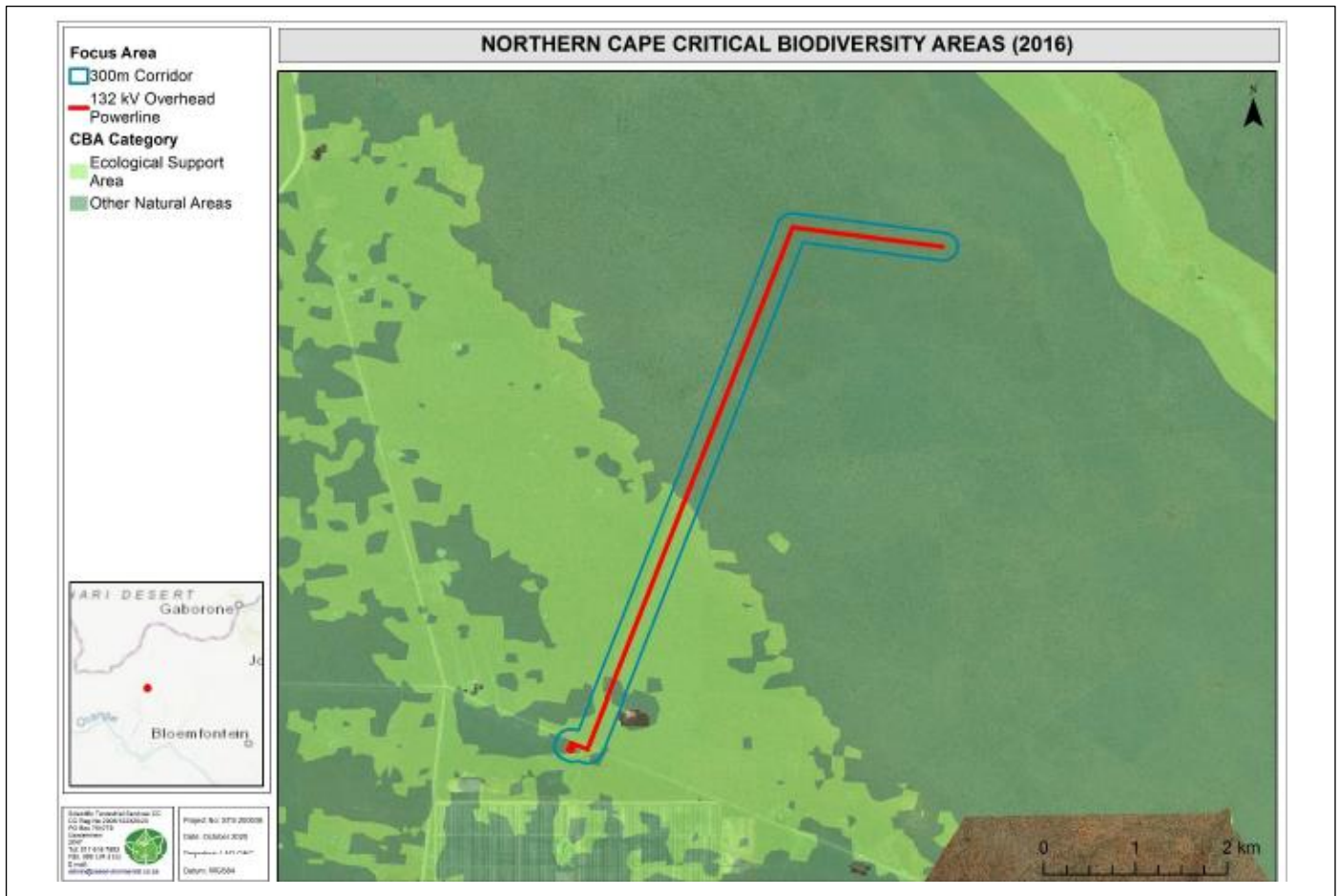


Figure 5.7: Northern Cape Critical Biodiversity areas associated with the project area and Hyperion-Kalbas 132kV power line

Listed and Protected Plant Species

Several plant species that are protected under Schedule 2 (Protected Species) of the Northern Cape Nature Conservation Act (Act No. 9 of 2009) were identified as having the potential to be located within the study area. As these species are provincially important, should they be present within the study area, they will require rescuing and relocation to a similar habitat near the study area before any construction commences. The focus area was observed to have a large and healthy population of *Vachallia erioloba*, and *Vachellia haematoxylon* trees, with individuals throughout ranging from between 1 m in height to larger than 4 m. A large majority of the tree individuals are below 2 m in height. A full list of species can be viewed in Table F1 of the Biodiversity specialist study (refer to Appendix D).

- **Alien and Invasive species Listed and Protected Plant Species**

Only one alien and invasive floral species has been identified within the focus area, *Prosopis glandulosa*. It is clear that the focus area has remained largely unaffected by alien plant species. The very low alien plant diversity is most likely attributed to the aridity of the region, with very limited habitat for the proliferation of alien plant species, and the area being in a location which has relatively little human activity. Despite this, there is an increased risk that further alien plant proliferation may occur during developmental activities.

5.8.2 Faunal Communities

Mammals

The potential diversity of mammals within the project site is moderate. Although more than 50 species of terrestrial mammals are known from the broader study area, the extent and habitat diversity of the project site is too low to support a very wide range of mammals. Species observed within the project site include Aardvark, Cape Porcupine, Springhare, South African Ground Squirrel, Scrub Hare, Vervet Monkey, Small-spotted Genet, Yellow Mongoose, Slender Mongoose, Black-Backed Jackal, Steenbok, Duiker and Kudu. Small mammals trapped in the area include Desert Pygmy Mouse, Multimammate Mouse, Bushveld Gerbil, Hairy footed Gerbil, Pouched Mouse and Grey Climbing Mouse. (Todd, 2018) Listed terrestrial mammal species that potentially occur in the area are included in **Appendix G1 of the Ecological report**.

Herpetofauna

The focus area is expected to have an intermediate reptile diversity. The focus area is well utilised by reptiles as sufficient burrows and vegetation structure are available for habitation, however rocky areas that would provide additional niche habitat are lacking. As such, although the focus area may potentially provide habitat to a large diversity of species, the homogenous sandy substrate of the focus area and lack of additional niche habitats will likely exclude several of these potential species. Reptile species previously observed within the area (3Foxes Biodiversity Solutions, 2019) include *Naja nivea* (Cape Cobra), *Bitis arietans arietans* (Puff Adder), *Lygodactylus capensis capensis* (Cape Gecko), *Psammophylax tritaeniatus* (Striped Skaapsteker), *Psammobates oculifer* (Serrated Tent Tortoise) and *Agama aculeata* (Ground Agama) amongst others..

The focus area lies within or near the range of approximately 10 amphibian species, however there are no natural (seasonal or permanent) water or artificial earth dams within the focus area. These areas of either permanent or seasonal, provided they are long standing enough, are for the most part necessary for amphibians to breed within, bar a small number of amphibians who are capable of breeding outside of any water source. The overall abundance and diversity of amphibian species within the focus area will be largely restricted due to the lack of permanent or seasonal water bodies within or immediately adjacent to the focus area. Only amphibian species which are relatively independent of water are likely to occur in the focus area. Species previously recorded in the surrounding areas (3Foxes Biodiversity Solutions, 2019) include *Amietophrynus garmani* (Eastern Olive Toad) and *Breviceps adspersus* (Bushveld Rain Frog), both of which may potentially occur within the focus area.

Avifauna

The bird assemblage recorded within the project site is typical of the Kalahari bioregion. Based on information derived from the South African Bird Atlas Project (SABAP1) approximately 219 bird species are expected to occur within the project site and the surrounding area of which 75 species were recorded within the project site.

The majority of the species consist of small passerines species, compared to non-passerines. Five near-endemic species reported for the broader study area include Fiscal Flycatcher, Karoo Thrush Fairy Flycatcher, Black-headed Canary and Black Harrier of which only the former two widespread species are relatively common in the broader study area.

The most abundant species at the project site was the Scaly-feathered Finch. Other common species which occurred at significantly lower abundances include Black-chested Prinia, Kalahari Scrub-robin and Chestnut-vented. These four species had the highest encounter rates of all detected species within the project site. The remaining species had significantly lower encounter rates, with the most common of these being Violet-eared Waxbill, Ant-eating Chat, Fork-tailed Drongo, Yellow Canary, and Burchell's Sandgrouse (mostly seen flying overhead) (Herman & Todd, 2018).

Conservation Areas, Protected Areas and Important Bird Areas (IBA)

The project site is situated approximately 156km south east of the Spitskop Dam which is considered to be an IBA. There are no other formal protected areas or any IBAs and Biodiversity Areas in close proximity to the project site.

5.9 Heritage Resources, including archaeology and palaeontology

5.9.1. Archaeology and the Built Environment

The modern town of Kathu dates back to the 1970s when iron ore mining commenced in the area. The former Crown Colony of British Bechuanaland was annexed by the Cape Colony on 16th November 1895. A year later, in December 1896 and January 1897, uprisings collectively known as the Langeberg Rebellion broke out in the area. Over the following months the Tlhaping and Tlharo took root in the Langeberg Mountains, west of modern-day Kathu, and were only suppressed by the Government in August 1897. The discontent among the Tlhaping and Tlharo people had arisen years earlier when, in 1884, approximately 75% of their land was taken away from them. Two years later the Land Commission met to settle land claims after the demise of the Boer Republics of Stellaland and Goshen, but little was done to help the Tlhaping and Tlharo people. Although ten (10) Native Reserves were proclaimed, 1400 square miles of crown land was made available for white settlement which created further friction and unhappiness. In addition to the loss of land, the Tswana chiefs were also losing their authority. Eventually, on 27 November 1896, seventeen head of cattle strayed out of the Taungs Reserve and were shot which appears to have been the critical moment when the rebellion began.

Several Kathu sites, together known as the Kathu Complex, have been formally graded as a Grade 1 heritage resource indicating that the collection of sites has been accorded national significance. An endemic camel-thorn tree forest situated north of the town of Kathu was registered as a National Heritage site in 1995. This forest has also been declared a protected woodland in terms of Section 12(1) (c) of the NFA (No. 84 of 1998). The area surrounding Kathu is most well-known for the extensive deposits of Early Stone Age (ESA) material that have been described in literature. The archaeological resources within and beyond

the proposed declaration area are under continued threat from development in the vicinity. Archaeology within the surrounding area tends to be physically associated with gravel deposits. South of Kathu, the surface sands are underlain directly by calcrete rather than gravel. The lack of known archaeological sites near the project site does not indicate a lack of archaeological deposits north of Kathu. This paucity is more of a reflection of this area being largely unexamined by archaeologists.

The following features of heritage significance have been identified within close proximity to the project site:

- » Kathu Pan;
- » Kathu Townlands;
- » Nature and density of development; and
- » Vegetation patterns

These sites indicate that archaeological materials are fairly widespread around Kathu and the area is best regarded as an archaeological landscape rather than a collection of individual sites.

a) Kathu Pan:

The Kathu Pan was discovered in 1974 and is the most studied and best-known heritage site in the area. The site is a natural sinkhole located within a large pan that, under natural conditions, would have filled with water during the summer (owing to the rising water table during the summer rainy season) and become a valuable water supply for prehistoric populations (Van Zinderen Bakker 1995). A sequence of Early Stone Age (ESA) deposits including some Fauresmith material and evidence for the onset of the Middle Stone Age (MSA) some 500 000 years ago (Wilkins 2013) have been identified at the site. Wilkins *et al.* (2012) have studied fracture patterns on points from the site and determined that they were used in a hafted manner as spear tips. The site has also yielded very early evidence for blade production (Wilkins & Chazan 2012). Faunal remains, including remains of species such as hippopotamus have been preserved at the site, which is unusual for Kathu.

b) Kathu Townlands:

The Kathu Townlands is situated across the surface of a low rise within the boundary of the town of Kathu. It was first reported in 1980 and had initial excavations carried out by Beaumont in 1982 and 1990 (Beaumont 1990). Due to the proposed development on the site, mitigation work was carried out to enable a better understanding of the deposits identified on the site (Walker *et al.* 2013). The archaeological material occurred within a dense accumulation of banded iron formation (BIF) rubble with a sandy matrix directly over bedrock. The artefacts from both the Beaumont and Walker excavations lack evidence of water transport, but damage to the artefacts does indicate mechanical damage through redeposition subsequent to the ESA occupation (Walker *et al.* 2014).

c) Bestwood:

Archaeological sites were first reported at Bestwood by Dreyer (2008) after which further research was undertaken by Chazan *et al.* (2012). Bestwood 1 and Bestwood 2 provide an indication of a larger landscape of artefacts that have been exposed by sand quarrying activity within in a sandy valley. A third site, Bestwood 3, is located on the hilltop along the east side of this valley. Initial investigation at Bestwood

1 revealed a lithic industry characterised by well-made hand-axes, well-retouched scrapers, occasional blades and a great diversity of core types (Chazan *et al.* 2012:331).

Excavations at Bestwood 1 demonstrated that material is present *in situ* in a single horizon beneath the covering sands Walker *et al.* (2013). This horizon is similar to the surface exposures at Bestwood 3 and Uitkoms 1 in terms of artefacts. Considering these observations (as well as other currently unpublished work done at Bestwood), it seems that the archaeological deposit extends beyond the limits of the quarries, across the landscape and connects the two hilltop exposures as a continuous horizon.

d) Uitkoms:

Various archaeological artefacts have been identified within the farm Uitkoms situated north east of Kathu. Beaumont has named these occurrences as Uitkoms 1, 2, 3 and 4. Uitkoms 1 appears to be similar to Kathu Townlands 1 in terms of artefact density and debitage frequency, but occurs on a hilltop. Uitkoms 4 is largely buried beneath surface sands in a manner similar to Bestwood 1 and 2, where bifaces are very similar to those from the quarries, but with a formal tool incidence about a thousand times higher (Beaumont 2008b:3). In 2006, two road cuttings along the N14 towards Kuruman contain ESA artefacts in a thin rubble of jaspilite and below red sand. One of these, Uitkoms 3, suggests that the Uitkoms 1 extends over the north western side of the Kathu hill. Uitkoms 2 could represent the extreme western limit of a site that may range over two upslope hills on Hartnolls (Beaumont, 2007).

5.9.2. Palaeontology

The project site is underlain by Late Cenozoic continental sediments of the Kalahari Group, thick calcretes of the Mokolanen Formation and gravels of the Obobogorop Formation and red Kalahari aeolian sands of the Gordonia Formation. Small inliers of Precambrian (Proterozoic) basaltic to andesitic lavas of the Ongeluk Formation crop out in the north-central and southern portions of the project site. These volcanic rocks form the basement to the Cenozoic Kalahari Group sediments in the region.

Proterozoic (Precambrian) volcanic bedrocks of the Ongeluk Formation are entirely unfossiliferous. The overlying Kalahari Group deposits in the surrounding Kathu area are considered to be of generally low palaeontological sensitivity (Almond 2014, 2015a, 2015b, Pether 2011), although localised areas of high sensitivity may occur. The main palaeontological heritage concern associated with the project site would be Quaternary mammalian remains (bones, teeth and horncores), trace fossils and plant fossils associated with solution hollows as well as ancient pan or *vlei* deposits along drainage lines, such as have been recorded from the well-known Kathu Pan site situated approximately 5.5.km north west of town of Kathu (Beaumont 1990, Beaumont 2004, Beaumont *et al.* 1984) (See also Almond 2013a, 2013b).

The geology of the Kathu region is indicated on 1:250 000 geological map 2722 Kuruman for which a sheet explanation has not yet been published (refer to **Figure 5.8**).

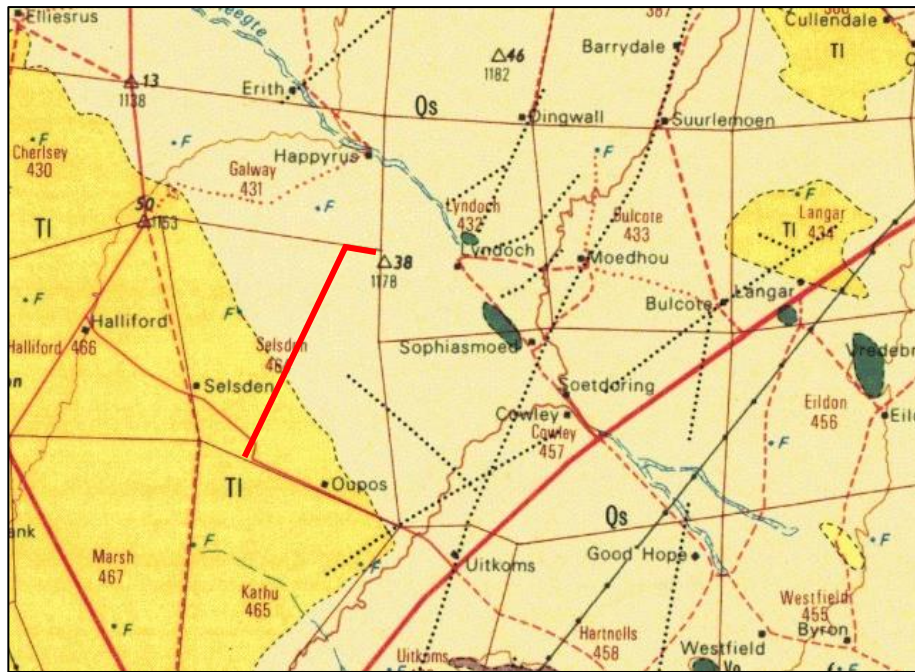


Figure 5.8: Extract from the 1:250 000 geological map 2722 showing the location of the propose powerline (red line). TI (yellow) indicates calcretes (surface limestone) of the Kalahari Group, while Qs (pale orange) denotes aeolian sands of the Gordonia Formation, Kalahari Group

Based on the SAHRIS Palaeosensitivity Map, the geological horizons present in the northern sections of the proposed corridor are of moderate palaeontological sensitivity and the southern sections is of high sensitivity (**Figure 5.9**).

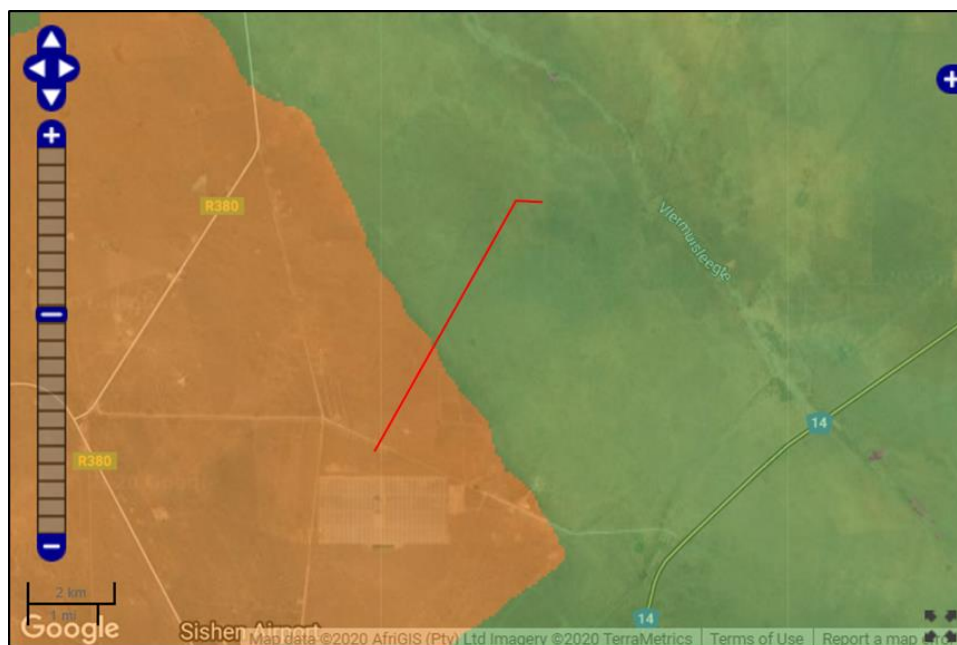


Figure 5.9: Extract from the SAHRIS Palaeosensitivity map showing the study area to be of moderate (green shading) to high (orange shading) sensitivity.

5.10 Visual Quality

5.10.1. Landscape Character

The project site is situated in a rural area dominated by cattle and game farming, with very little agricultural activity due to the scarcity of perennial water (refer to **Figure 5**). Limited developments are located within the broader study area. The largest infrastructure occurs at the Remainder of the Farm Kathu 465, where the existing Eskom Kalbas Substation is located, and the infrastructure associated with the future Hyperion Hybrid Facility.



Figure 5.10: Visual quality of the receiving environment.

The area is sparsely populated (less than 5 people per km²), with the highest concentrations occurring in the towns of Kathu and Deben, and at the Sishen Mine.

Significant expanses of land south of the study area have been transformed by mining, prospecting activities and settlements. In addition to the towns and the mine settlements, several isolated homesteads occur throughout the study area, usually located along or near the N14 national road, the R380 arterial road or secondary roads. These roads provide for the motorised access to the solar energy facilities located within the region.

5.10.2. Potential Visual Exposure & Visual Receptors

The vacant and open space area surrounding the powerline generally has few potential sensitive visual receptors. However, the powerline will be visible from the T25 secondary road where it transverses the road before connection to the Kalbas Substation. It may also be visible from the Oupos and Selsden homesteads.

5.11 Social Characteristic of Broader Study Area and Project Site

The following is a baseline summary of the socio-economic profile of the Gamagara Local Municipality within which the proposed Hyperion-Kalbas 132kV power line is proposed:

- » The Gamagara LM covers an area of land approximately 2 619km² in extent, and comprises five towns, namely: Kathu, Shesheng, Dibeng, Dingleton, and Olifantshoek. The town of Kathu is the largest within the LM and the administrative centre of the LM.
- » The population of the Gamagara LM in 2011 was 41 617. There is no data from the 2016 Community Household Survey for the GLM. Of this total, 29.9% were under the age of 18, 67.5% were between 18 and 64, and the remaining 2.6% were 65 and older. The population of Ward 7 in 2011 was 1 529. Of this total, 20.3% were under the age of 18, 74.1% were between 18 and 64, and the remaining 5.6% were 65 and older. The Gamagara LM and Ward 17 therefore have a high percentage of the population that fall within the economically active group of 18-65 compared to the JTGDM and Northern Cape (55.1% and 58.5% respectively). 2001 and 2011 the Gamagara LM experienced a positive population growth rate of 5.8% per year, almost doubling in size from 23 202 people in 2001 to 41 617 people in 2011.
- » Black Africans comprise the predominant population group within the Gamagara LM, John Taolo Gaetsewe DM, and Northern Cape Province.
- » The Gamagara LM, John Taolo Gaetsewe DM, and Northern Cape Provincial population age structures are youth dominated. A considerable proportion of the respective populations therefore comprise individuals of the economically active population between the ages of 15 – 64.
- » The Gamagara LM has a dependency ratio of 48%, which is considerably lower than the John Taolo Gaetsewe DM (63.3%), Northern Cape Province (55.7%), and South Africa (52.7%) as a whole.
- » In terms of education levels, the percentage of the population over 20 years of age in the GLM and Ward 7 with no schooling was 9.9% and 10.4% (2011) respectively, compared to 11.1% for the Northern Cape Province in 2011. The percentage of the population over the age of 20 with matric was 29.5% and 34.6% respectively, compared to 25.2% for the Northern Cape.
- » The figures for Ward 7 in 2011 were 7% unemployed 77.1% employed, 14.3% not economically active and 1.6% discouraged work seekers. The unemployment rates for the GLM and Ward 7 are lower than the Provincial rate of 14.5% and the District rate of 13.5%. This reflects the key role played by the mining sector in the Gamagara LM.
- » Household income levels in the LM are higher than the DM, province and South Africa as a whole, with a lower proportion of low-income earners, and higher proportion of high-income earners. The area can therefore be expected to have a lower poverty level with associated social consequences such as not being able to pay for basic needs and services, and poor living conditions than that of the DM and Northern Cape Province.
- » The primary economic activities within the Gamagara LM include mining, game farming, and business services.
- » Most households within the Gamagara LM comprise formal brick dwellings.
- » Most households within the Gamagara LM are well serviced with regards to electricity, water, sanitation, and refuse removal.

CHAPTER 6: ASSESSMENT OF IMPACTS

This Chapter serves to assess the significance of the positive and negative environmental impacts (direct and indirect) expected to be associated with the establishment of the Hyperion-Kalbas 132kV power line. The proposed project will comprise the following key infrastructure and components:

- » A single- or double-circuit 132kV overhead power line; and
- » Associated infrastructure:
 - Laydown areas.
 - Servitude road.

A corridor of 300m and approximately 8km long is being assessed to allow for the optimisation of the power line route and to ensure avoidance of any environmental sensitivities.

The height of the power line towers will be up to 24m and the servitude width will be up to 32m.

The full extent of the identified corridor was considered through the BA process by the independent specialists and the EAP through the review of existing information, desktop evaluations and field surveys.

The proposed power line will comprise the following phases:

- » *Pre-Construction and Construction* – will include pre-construction surveys; site preparation; establishment of access roads; a temporary laydown area and facility infrastructure; construction of foundations involving excavations, the transportation of components/construction equipment to site, manoeuvring and operating vehicles for unloading and installation of equipment; cabling; and commissioning of new equipment and site rehabilitation. The construction phase for the Hyperion-Kalbas 132kV power line is estimated at 10-12 months.
- » *Operation* – will include the operation of the Hyperion-Kalbas 132kV power line and transmission of electricity generated at the Hyperion Hybrid Facility, which will be fed into the national grid via the existing Kalbas Substation. Regular maintenance will be undertaken to ensure optimal operation of the line. The operation phase of the power line is expected to be approximately 20 years (with maintenance).
- » *Decommissioning* – the power line and the associated infrastructure will be decommissioned at the end of the power line's economic life. Decommissioning will include the disassembly of the power line components. Where the components cannot be reused or recycled, these will be disposed of in accordance with the regulatory requirements at the time of decommissioning. Disturbed areas where infrastructure has been removed will be rehabilitated if required and depending on the future land use of the affected area and the relevant legislation applicable at the time of decommissioning.

Environmental impacts associated with the pre-construction, construction (and decommissioning) of the Hyperion-Kalbas 132kV powerline will include, amongst others habitat loss (for fauna and avifauna species); impacts on vegetation and protected plant species; and impacts on aquatic habitats (i.e. pans). In addition, impacts anticipated for the operation phase of the power line, among others include the

electrocution and collisions of avifauna species and visual impacts on the rural homesteads, and travellers on the T25 secondary road.

6.1. Legal Requirements as per the EIA Regulations, 2014 (as amended), for the undertaking of a Basic Assessment Report

This chapter of the BA Report includes the following information required in terms of Appendix 1: Content of the BA Report:

Requirement	Relevant Section
3(h)(v) the impacts and risks identified including the nature, significance, consequence, extent, duration and probability of the impacts, including the degree to which these impacts (aa) can be reversed, (bb) may cause irreplaceable loss of resources, and (cc) can be avoided, managed or mitigated.	The impacts and risks associated with the development of the Hyperion-Kalbas 132kV power line including the nature, significance, consequence, extent, duration and probability of the impacts and the degree to which the impact can be reversed and cause an irreplaceable loss of resources are included in 6.3., 6.4., 6.5., 6.6., 6.7,6.8., 6.9. and 6.10.
3(h)(vii) positive and negative impacts that the proposed activity and alternatives will have on the environment and on the community that may be affected focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects	The positive and negative impacts associated with the development of the Hyperion-Kalbas 132kV power line are included in sections 6.3. ,6.4., 6.5., 6.6., 6.7, 6.8., 6.9. and 6.10.
3(h)(viii) the possible mitigation measures that could be applied and the level of residual risk.	The mitigation measures that can be applied to the impacts associated with the Hyperion-Kalbas 132kV power line are included in sections 6.3., 6.4., 6.5., 6.6., 6.7, 6.8., 6.9. and 6.10.
3(i) a full description of the process undertaken to identify, assess and rank the impacts the activity will impose on the preferred location through the life of the activity, including (i) a description of all environmental issues and risks that were identified during the environmental impact assessment process and (ii) an assessment of the significance of each issue and risk and an indication of the extent to which the issue and risk could be avoided or addressed by the adoption of mitigation measures.	A description of all environmental impacts identified for 132kV power line infrastructure during the BA process, and the extent to which the impact significance can be reduced through the implementation of the recommended mitigation measures provided by the specialists are included in sections 6.3., 6.4., 6.5., 6.6., 6.7, 6.8., 6.9. and 6.10.
3(j) an assessment of each identified potentially significant impact and risk, including (i) cumulative impacts, (ii) the nature, significance and consequences of the impact and risk, (iii) the extent and duration of the impact and risk, (iv) the probability of the impact and risk occurring, (v) the degree to which the impact and risk can be reversed, (vi) the degree to which the impact and risk may cause irreplaceable loss of resources and, (vii) the degree to which the impact and risk can be avoided, managed or mitigated.	An assessment of each impact associated with the development of 132kV power line infrastructure , including the nature and significance, the extent and duration, the probability, the reversibility, and the potential loss of irreplaceable resources, as well as the degree to which the significance of the impacts can be mitigated are included in sections 6.3., 6.4., 6.5., 6.6., 6.7., 6.8., 6.9. and 6.10.
3(m) based on the assessment, and where applicable, impact management measures from specialist reports, the recording of the proposed impact management outcomes for the development for inclusion in the EMPr.	Mitigation measures recommended by the various specialists for the reduction of the impact significance are included in sections 6.3., 6.4., 6.5., 6.6., 6.7, 6.8., 6.9. and 6.10.

6.2 Assessment of Impacts on Ecology (Fauna and Flora)

The development and operation of the 132kV power line for the Hyperion Hybrid Facility will have an impact on the ecological resources identified within the development area. These resources include vegetation, protected and listed plant species; fauna; habitat; conservation and broad-scale ecological processes.

A summary of the ecological impacts identified and the significance thereof for the proposed development are included below. Refer to **Appendix D** for more detail.

6.2.1. Results of the Ecological Impact Assessment

One habitat unit was identified within the focus area, namely the Kathu Bushveld. Within the Kathu Bushveld habitat unit, suitable habitat exists to support an array of floral and faunal species.

No floral SCC (i.e. Red Data Listed plants) were observed within the focus area. However, two protected trees, namely *Vachellia erioloba* and *V. haematoxylon*, were recorded. Furthermore, the focus area provides suitable habitat for the protected tree species, *Bosica albitrunca*. This species was identified within the surrounding area and as such has the potential to disperse and establish within the focus area.

The focus area also provides suitable habitat to support several faunal SCC. Potential faunal SCC are unlikely to permanently reside within the focus area, as many require large areas to forage and survive. No mammal SCC were recorded during the site assessment undertaken. The majority of mammal SCC in arid regions such as the study area are often secretive and not often seen. Overall, the focus area is considered to have an intermediate mammal sensitivity.

No significant impacts on the biodiversity associated with the focus area are anticipated for the proposed development.

6.2.2. Description of Ecological Impacts

The following ecological impacts were identified:

» *Impact on Floral Habitat and Diversity, and Floral SCC*

The proposed development will result in the clearance of vegetation that is of intermediate sensitivity (refer to **Figure 6.1**). The proposed development will result in the loss of indigenous species, but the impact will be localised within the footprint area and no regional (provincial) impacts on floral communities are anticipated. In addition, the proposed development will result in the clearance of several NFA protected tree species.

» *Impact on Faunal Habitat and Diversity, and Faunal SCC*

The proposed development of the power line will result in a loss of faunal habitat within the footprint areas of the power line towers and servitude road. However, the development footprints will be small, resulting in low expected impact on habitat loss. No faunal species of conservation concern (SCC) were directly observed within the focus area; however, several SCC do have an increased probability of occurring within the focus area.



Figure 6.1: Combined Ecological sensitivity map of fauna and flora for Hyperion-Kalbas 132kV powerline assessment corridor

6.2.3. Assessment of Potential Impacts

Construction Phase Impacts

Nature: <u>Impact of floral habitat and diversity, and floral SCC</u>		
The floral communities associated with the Kathu Bushveld habitat unit are well represented in the focus area and in the surrounding region. As such a significant loss of floral communities is not anticipated. The proposed development will result in the clearance of several NFA protected tree species. Provided that strict mitigation measures are implemented, the impact on protected floral species and their associated communities is expected to be localised.		
	Without mitigation	With mitigation
Extent	Local (3)	Local (2)
Duration	Long-term (4)	Medium-term (3)
Magnitude	Moderate (4)	Low (2)
Probability	Highly Probable (4)	Probable (3)
Significance	Medium (44)	Low (21)
Status (positive or negative)	Negative	Negative
Reversibility	Moderate	Moderate
Irreplaceable loss of resources?	Low	Low
Can impacts be mitigated?	Yes (to an extent)	
Mitigation:		
<ul style="list-style-type: none"> » The construction footprint must be kept as small as possible to minimise the impact on the surrounding environment (edge effect management). » Removal of vegetation must be restricted to what is absolutely necessary and should remain within the approved development footprint. » Clearing of vegetation should take place in a phased manner. This will allow for faunal species within the focus area to flee and avoid harm. » Vehicles should be restricted to travelling only on designated roadways to limit the ecological footprint of the construction activities. Additional road construction should be limited to what is absolutely necessary, and the footprint thereof kept to a minimum. » No collection of floral SCC must be allowed by construction personnel. » Informal fires by construction personnel should be prohibited, and no uncontrolled fires whatsoever should be allowed. » Care should be taken during the construction and operation of the proposed development to limit edge effects to surrounding natural habitat. This can be achieved by: <ul style="list-style-type: none"> • Demarcating all footprint areas during construction activities; • No construction rubble or cleared alien invasive species are to be disposed of outside of demarcated areas, and should be taken to a registered waste disposal facility; • All soils compacted because of construction activities should be ripped and profiled and reseeded; and • Manage the spread of AIP species, which may affect remaining natural habitat within surrounding areas. » Appropriate sanitary facilities must be provided during the construction of the development and must be removed to an appropriate waste disposal site. » No dumping of litter, rubble or cleared vegetation on site should be allowed. Infrastructure and rubble removed because of the construction activities should be disposed of at an appropriate registered dump site away from the development footprint. No temporary dump sites should be allowed in areas with natural vegetation. It is advised that appropriate waste disposal containers and bins be provided during the construction phase for all construction rubble and general waste. Vegetation cuttings must be carefully collected and disposed of at a separate waste facility. » If any spills occur, they should be immediately cleaned up to avoid soil contamination that can hinder floral rehabilitation later down the line. Spill kits should be kept on-site within workshops. In the event of a breakdown, 		

<p>maintenance of vehicles must take place with care, and the recollection of spillage should be practised, preventing the ingress of hydrocarbons into the topsoil.</p> <ul style="list-style-type: none"> » Upon completion of construction activities, it must be ensured that no bare areas remain, and that indigenous species be used to revegetate the disturbed area. » Edge effects arising from the proposed development, such as erosion and alien plant species proliferation, which may affect adjacent natural areas, need to be strictly managed. Specific mention in this regard is made of Category 1b AIP species (as listed in the NEMBA Alien species lists, 2016), in line with the NEMBA Alien and Invasive Species Regulations (2014): <ul style="list-style-type: none"> • Ongoing alien and invasive plant monitoring and clearing/control should take place throughout the construction and operational phase of the development, and a 30m buffer surrounding the footprint and disturbed areas should be regularly checked for AIP proliferation and to prevent spread into surrounding natural areas; and • Alien vegetation that is removed must not be allowed to lay on unprotected ground as seeds might disperse upon it. All cleared plant material to be disposed of at a licensed waste facility which complies with legal standards. » The relocation success of floral SCC should be monitored during the construction phase to ensure immediate actions can be taken if it becomes evident that relocation is not successful. » No collection of floral or faunal SCC or medicinal floral species must be allowed by construction personnel. » Edge effect control needs to be implemented to prevent further degradation and potential loss of floral and faunal SCC outside of the proposed development footprint area.
<p>Residual Impacts:</p> <ul style="list-style-type: none"> » Permanent loss of and altered floral species diversity outside of the focus area, including loss of favourable habitat for SCC;

<p>Nature: <i>Impact on faunal habitat and diversity, and faunal SCC</i></p> <p>The proposed development of the power line will result in a loss of faunal habitat within the footprint areas of the power line towers and servitude road. No faunal SCC were directly observed within the focus area; however, several SCC do have an increased probability of occurring within the focus area. It is imperative that vegetation clearance is kept to a minimum and that prior to any clearance activities taking place, the footprint areas be actively searched (walkdown) for the presence of SCC,</p>		
	Without mitigation	With mitigation
Extent	Local (2)	Local (2)
Duration	Medium-term (3)	Short-term (2)
Magnitude	Minor (2)	Minor (26)
Probability	Highly Probable (4)	Probable (3)
Significance	Low (24)	Low (18)
Status (positive or negative)	Negative	Negative
Reversibility	Moderate	Moderate
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	Yes	
<p>Mitigation:</p> <ul style="list-style-type: none"> » No hunting or trapping of faunal species is to be allowed by construction personnel. » Smaller species such as scorpions and reptiles will be less mobile during rainfall events and cold days (winter) and as such will not readily be able to move out of an area ahead of ground clearing activities. As such should any be observed in the construction site during clearing and construction activities, they are to be carefully and safely moved to an area of similar habitat outside of the disturbance footprint. Construction personnel are to be educated about these species and instructed not to kill them. Smaller scorpion species and harmless reptiles should be carefully relocated by a suitably nominated construction person. For larger venomous snakes, 		

<p>a suitably trained specialist, or on-site personnel, should be contacted to carry out the relocation of the species, should it not move off on its own.</p> <ul style="list-style-type: none"> » Should the presence of any faunal SCC be noted, or their breeding sites be located, notably ground dwelling or nesting species, within the development footprint a suitably qualified specialist should be consulted on the best way to proceed.
<p>Residual Impacts:</p> <ul style="list-style-type: none"> » Permanent loss of and altered faunal species diversity outside of the focus area, including loss of favourable habitat for SCC

Operation Phase Impacts

<p>Nature: <i>Impacts on floral habitats and diversity, and floral SCC</i></p> <p>The majority of impacts on floral habitats and diversity, and floral SCC are expected to occur during the construction phase and the expected impact of the operational phase is low. However, mitigation measures have been specified to minimise any residual impacts.</p>		
	Without mitigation	With mitigation
Extent	Local (1)	Local (1)
Duration	Long-term (4)	Long-term (4)
Magnitude	Low (4)	Minor (2)
Probability	Probable (3)	Probable (3)
Significance	Low (27)	Low (21)
Status (positive or negative)	Negative	Negative
Reversibility	Moderate	Moderate
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	To a large extent	
<p>Mitigation:</p> <ul style="list-style-type: none"> » Disturbed areas from the construction of the power line are to be rehabilitated to a similar state as that of pre-disturbance conditions. Where this is not possible due to operational and maintenance requirements, it is recommended that at a minimum a suitable herbaceous layer is maintained within the footprint of the power line servitude and around towers so as to ensure that no erosion occurs. » At a minimum a short herbaceous layer must be maintained around all power line towers so that a semblance of faunal habitat is reinstated in these areas. » Ongoing alien and invasive plant monitoring and clearing/control should take place throughout the operational phase, and the project perimeters should be regularly checked for AIP establishment to prevent spread into surrounding natural areas. » Alien vegetation that is removed must not be allowed to lay on unprotected ground as seeds might disperse upon it. All cleared plant material to be disposed of at a licensed waste facility, which complies with legal standards. » Monitoring of relocation success should continue for at least three years after the completion of the construction phase, or until it is evident that the species have established self-sustaining populations. 		
<p>Residual Impacts:</p> <ul style="list-style-type: none"> » Continued loss of and altered floral species diversity outside of the focus area, including loss of favourable habitat 		

<p>Nature: <i>Impact on faunal habitat and diversity, and faunal SCC</i></p> <p>The majority of impacts on faunal habitats and diversity, and faunal SCC is expected to occur during the construction phase and the expected impact of the operational phase is low. However, mitigation measures have been specified to minimise any residual impacts</p>

	Without mitigation	With mitigation
Extent	Local (2)	Local (1)
Duration	Medium-term (3)	Short-term (3)
Magnitude	Minor (2)	Minor (2)
Probability	Highly Probable (4)	Improbable (2)
Significance	Low (28)	Low (12)
Status (positive or negative)	Negative	Negative
Reversibility	Low	High
Irreplaceable loss of resources?	Low	Low
Can impacts be mitigated?	Yes, with proper management and avoidance	
Mitigation:		
» Monitoring of plant species relocation success should continue for at least three years after the completion of the construction phase, or until it is evident that the species have established self-sustaining populations.		
Residual Impacts:		
Even with extensive mitigation, residual impacts on the receiving faunal ecological environment are deemed likely. The following points highlight the key residual impacts that have been identified:		
» Continued loss of faunal habitat through improperly controlled edge effects and AIP proliferation		

6.2.4. Implications for Project Implementation

Based on the outcomes of the assessment of impacts associated with the construction of the power line impacts on the ecological features are considered to range from medium-low to low significance impacts prior to the implementation of mitigation measures. With mitigation fully implemented all impacts can be reduced to low and very low significance impacts. No significant impacts on the biodiversity associated with the focus area are anticipated for the proposed development. Mitigation measure appropriate for the project are detailed below:

- » Before the commencement of any development activities within the focus area, a walk-through should be conducted to ensure this species is not present.
- » If its presence within the focus area is confirmed, permits will have to be obtained from DEFF for the individuals that will have to be removed for construction to proceed. Furthermore, should any species of concern be located within areas designated for clearing activities, these individuals are to be relocated to suitable habitat in the surrounding area by a specialist.

6.3. Assessment of Impacts on Avifauna

6.3.1. Results of the Avifauna Impact Assessment

The focus area is considered to be of an intermediate sensitivity, mainly as a result of the natural and unaltered nature of the landscape within the focus area and the intermediate abundance and diversity of birds.

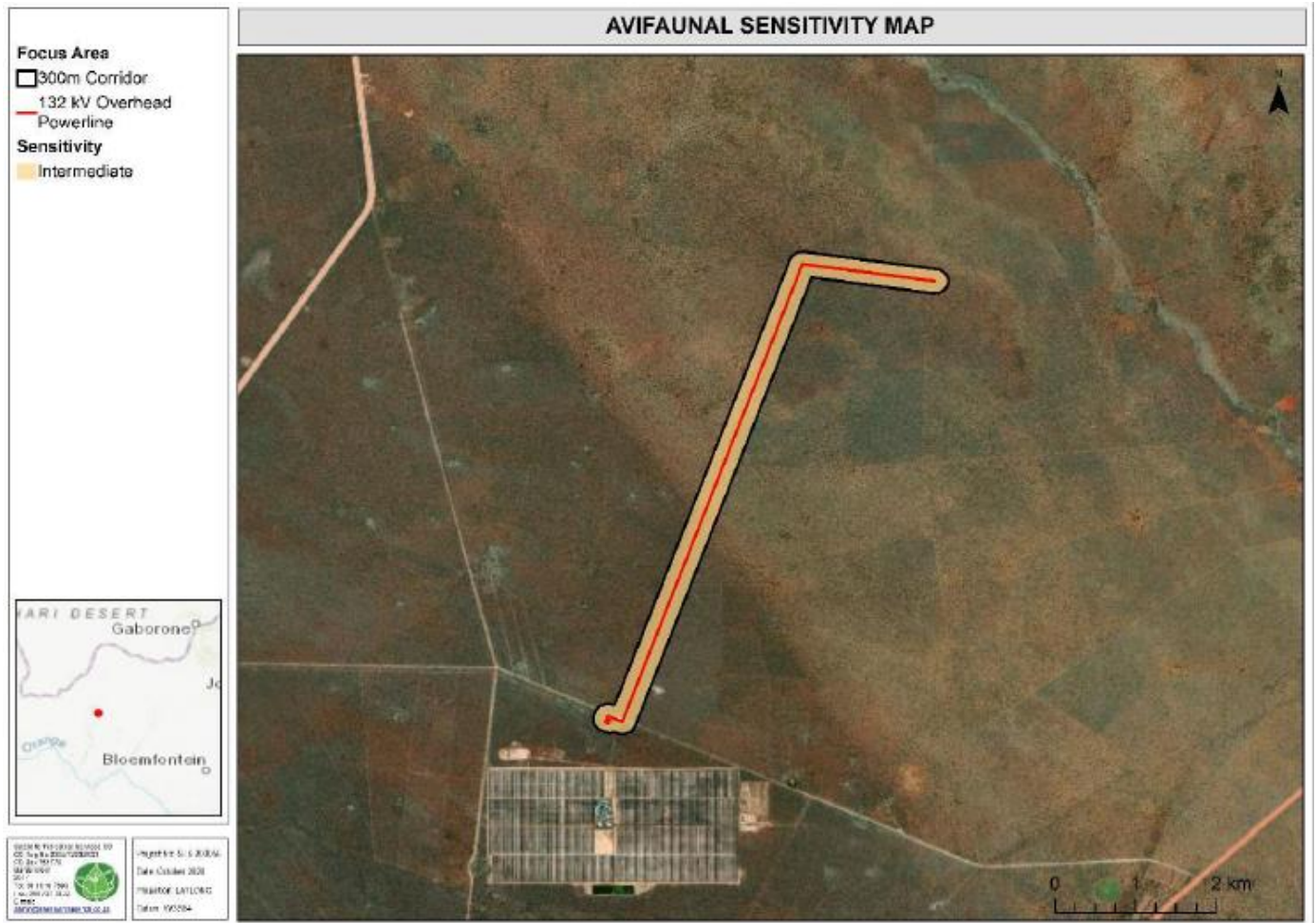


Figure 6.2: Avifaunal sensitivity map for Hyperion-Klabas 132kV power line

Ten protected faunal species may either inhabit the focus area or utilize it for foraging on an intermittent basis. Several species, including; *Polemeatus bellicosus* (Martial Eagle, EN), *Aquila rapax* (Tawny Eagle EN), *Cursorius rufus* (Burchell's courser, VU), *Sagittarius serpentarius* (Secretarybird, VU) and *Ardeotis kori* (Kori Bustard, NT) may breed within the focus area as suitable habitat is available. Although several species of concern likely forage and/or breed here, the proposed activities will not alter the landscape to an extent where it will no longer be habitable to these species and effective mitigation can reduce the potential impacts anticipated (**Appendix E**).

6.3.2. Description of Avifaunal Impacts

The following impacts on avifauna were identified:

» *Impact on avifaunal diversity and habitat*

The major impact resulting from the proposed infrastructure will occur in the operation phase and is associated with the potential for avifauna (particularly larger birds) to collide with the power line or be electrocuted while perching on the towers. These impacts may reduce abundances. Little habitat is anticipated to be transformed and therefore diversity is not anticipated to be altered. Avifaunal diversity within the focus area is considered intermediate and is unlikely to be affected as a result of the proposed development. The impact significance of the loss of avifaunal species diversity based on the proposed

layout plans for the construction and operational phases is expected to be medium prior to the implementation of mitigation measures and low should mitigation be implemented thoroughly. The relatively small footprint of the development within the broader habitat should not cause any long-term impacts to the diversity yet the integrity of the focus area may be degraded.

» *Impact on avifaunal diversity and habitat*

Local migrations from the development footprint and its direct surroundings will likely occur during the construction phase and will lead to higher competition for resources in adjacent habitats, yet, this will occur over the short term and it is likely that once disturbance frequency is reduced that the diversity within the focus area will return to baseline levels if proper mitigation is implemented.

6.3.3. Assessment of Potential Impacts

Construction Phase Impacts

Nature: <i>Loss of avifaunal habitat and diversity, and avifaunal SCC</i>		
	Without mitigation	With mitigation
Extent	Local (3)	Local (2)
Duration	Short-term (2)	Short-term (2)
Magnitude	Moderate (6)	Low (4)
Probability	Highly Probable (4)	Probable (3)
Significance	Medium (44)	Low (24)
Status (positive or negative)	Negative	Negative
Reversibility	Moderate	Moderate
Irreplaceable loss of resources?	Low	Low
Can impacts be mitigated?	Yes	
Mitigation:		
<ul style="list-style-type: none"> » The development footprint should be demarcated, and it should be ensured that no development related activities take place outside of the demarcated footprint. This final footprint area should be reviewed by an avifaunal specialist to ensure no detrimental impacts to avifaunal assemblages occur. » In order to reduce potential avifaunal collisions and electrocutions from the power line during operation, large trees within the servitude should be cut rather than removed to restrict perching areas where collisions may occur. » Any structures which may act as perching sites for birds should be installed with anti-perching spikes. » Should any lights be installed they should face downwards to reduce the abundance of insects attracted to the night lights. This prey source may attract birds to the focus area and may increase avian collisions or electrocutions. » Avifaunal habitat beyond the demarcated area should not be cleared or altered. » Avifaunal monitoring along the power line should be undertaken and reported monthly to monitor or record avifauna and collect any birds which have collided with or been electrocuted by the proposed infrastructure. These must be reported by the ECO to the Department and further mitigation measures should be investigated in how to minimise the mortalities. » Anti-collision devices should be installed along the entire length of the power line. These must be Eskom approved anti-collision devices that are durable as the area is prone to strong winds. Anti-collision devices must be installed as soon as the wires are strung. The devices must be installed 5m apart and alternate between a light and dark colour in order to increase the visibility of the earth wires. » Construction vehicles should be restricted to travelling only on designated roadways to limit the ecological footprint of the development activities. » No dumping of litter, rubble or cleared vegetation on site should be allowed. As such it is advised vegetation cuttings (especially AIP) to be carefully collected and disposed of at a separate waste facility. 		

- » If any spills occur, they should be immediately cleaned up to avoid soil contamination that can hinder floral rehabilitation later down the line and avifaunal recolonization. In the event of a breakdown, maintenance of vehicles must take place with care, and the collection of spillages should be practised preventing the ingress of hydrocarbons into the topsoil.
- » No hunting/trapping or collecting of avifaunal species is allowed.
- » No collection of avifaunal SCC within the focus area may be allowed by construction personnel.
- » Edge effect control needs to be implemented to prevent further degradation and potential loss of avifaunal SCC habitat outside of the proposed development footprint.
- » Should any avifaunal species protected under the National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004) or the Northern Cape Nature Conservation Act, 2009 (Act No. 9 of 2009) be encountered and require relocation, construction should be halted and authorisation to relocate such species must be obtained from NCDENC or the Department of Environmental Affairs (DEA).
- » Edge effect control needs to be implemented to ensure no further degradation and potential loss of avifaunal SCC outside of the proposed project footprint area.
- » Where relocation is required to avoid impacts, a suitable rescue and relocation plan should be developed and overseen by a suitably qualified specialist should SCC be identified within the focus area in order to ensure that species loss during construction activities is kept to a minimum.
- » No illicit fires must be allowed during the construction phase of the proposed development.
- » A rehabilitation plan should be compiled by a suitable specialist. This rehabilitation plan should consider all development phases of the project indicating rehabilitation actions to be undertaken during, and once construction has been completed as well as ongoing rehabilitation during the operational phase of the project to ensure habitat for avifauna is restored.
- » Any natural areas beyond the development footprint, that have been affected by the construction activities, must be rehabilitated using indigenous plant species.

Residual Impacts:

Identified for operational phase (see below table)

Operation Phase Impacts

Nature: <i>Loss of avifaunal habitat, species and SCC</i>		
	Without mitigation	With mitigation
Extent	Local (3)	Local (2)
Duration	Long-term (4)	Long-term (4)
Magnitude	Moderate (6)	Low to Minor (3)
Probability	High Probable (4)	Probable (3)
Significance	Medium (40)	Low (27)
Status (positive or negative)	Negative	Negative
Reversibility	Moderate	Moderate
Irreplaceable loss of resources?	Low	Low
Can impacts be mitigated?	Yes, to a large degree, but it may be more difficult to prevent collisions.	
Mitigation:		
<ul style="list-style-type: none"> » All vehicles should be restricted to travelling only on designated roadways to limit the ecological footprint of the development activities. » Monitoring (monthly) should be undertaken and a record of potential bird strikes or collisions should be kept and reported. » Ongoing alien and invasive plant monitoring and clearing/control should take place throughout the operational phase, and the project perimeters should be regularly checked for AIP establishment to prevent spread into surrounding natural areas which may alter the suitability of the habitat to avifaunal species. 		

- » Alien vegetation that is removed must not be allowed to lay on unprotected ground as seeds might disperse upon it. All cleared plant material to be disposed of at a licensed waste facility, which comply with legal standards.
- » No collection of avifaunal SCC within the focus area may be allowed by operational phase personnel unless as part of mortality monitoring activities.
- » Where bare soils are left exposed as a result of construction activities, they should be immediately rehabilitated. Rehabilitated efforts should continue to be monitored throughout the operational phase, until natural processes will allow the ecological functioning and biodiversity of the area to be re-instated.

Residual Impacts:

Even with extensive mitigation, significant residual impacts on the receiving faunal ecological environment are deemed highly likely. The following points highlight the key latent impacts that have been identified:

- » Continued loss of avifaunal habitat;
- » Reduction in avifaunal SCC presence and in the surrounding habitats through edge effects, collisions and electrocutions;
- » Loss of and altered avifaunal species diversity
- » Reduction of avifaunal abundance; and
- » Disturbed areas are highly unlikely to be rehabilitated to baseline levels of ecological functioning and loss of avifaunal habitat, species diversity and avifaunal SCC may be permanent if mitigations are not implemented.

6.3.4. Implication of Project Implementation

With the implementation of specified mitigation measures the expected significance of impacts associated with the power line will be low. associated with the development of the power line will be low. From the outcomes of the avifauna impact assessment, it is concluded that the power line can be developed and impacts on avifauna can be managed by taking the following into consideration:

- » Edge effect control needs to be implemented to prevent further degradation and potential loss of avifaunal species of concern habitat outside of the proposed development footprint.
- » In order to reduce potential avifaunal collisions and electrocutions from the powerlines, large trees should be cut rather than removed to restrict perching areas where collisions may occur
- » All vehicles should be restricted to travelling only on designated roadways to limit the ecological footprint of the development activities;

6.4 Assessment of Impacts on Aquatic Resources

6.4.1. Results of the Aquatic Resources Impact Assessment

The cryptic wetlands identified outside the corridor but within 500m, is in a largely natural ecological condition, with few to no impacts on the hydraulic and geomorphological processes. The area surrounding the identified cryptic wetlands is mainly natural, untransformed areas; however, sand mining and various informal roads were identified as the main anthropogenic activities occurring within the local catchment of these wetlands. No modification is anticipated to the extent of the delineated cryptic wetlands, and no power line infrastructure is proposed within the cryptic wetlands that may fragment or degrade the system. (Appendix G)

6.4.2. Description of Aquatic Impacts

There are three key ecological impacts on the cryptic wetlands that are anticipated to occur namely:

- » Impacts on the hydrology and sediment balance of the wetlands;
- » Changes to the socio-cultural and service provision; and
- » Impacts on water quality.

Various activities and development aspects may lead to these impacts, however, provided that the mitigation hierarchy is followed, some impacts can be avoided (considering that the cryptic wetlands are not located within the proposed project footprint) or adequately minimised where avoidance is not feasible.

6.4.3. Assessment of Potential Impacts

Construction Phase Impacts

Nature: <i>Site preparation prior to construction activities (within 500m of the cryptic wetlands) resulting in disturbance to soil and potential sedimentation of cryptic wetlands</i>		
Site preparation as part of the construction of proposed power line will require vehicular movement (transportation of construction materials) and removal of vegetation within the development footprint and associated disturbances to soil, potentially including grading of existing informal farm roads. This is likely to result in the following impacts to the cryptic wetlands:		
<ul style="list-style-type: none"> » Transportation of construction materials can result in disturbances to soil, and increased risk of sedimentation/erosion; » Soil and stormwater contamination from potentially spilled oils and hydrocarbons originating from construction vehicles; » Exposure of soil, leading to increased runoff, and erosion, and thus increased sedimentation of the receiving wetlands; » Dust pollution during construction which may impact on water quality; and » Proliferation of alien and/or invasive vegetation as a result of disturbances. 		
	Without Mitigation	With Mitigation
Extent	Local (2)	Local (1)
Duration	Very short (1)	Very short (1)
Magnitude	Moderate (4)	Minor (2)
Probability	Highly Probable (4)	Improbable (2)
Significance	Medium (28)	Low (8)
Status	Negative	Negative
Reversibility	High	High
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	Yes	Yes
Mitigation		
<ul style="list-style-type: none"> » Construction works should ideally be undertaken during the dry, winter months when the flow/level of water is very low in the wetlands. » Due to the accessibility of the sites, no unnecessary crossing of the wetlands may be permitted and it is strongly recommended that the 32m Zone of Regulation (ZoR) be considered a no-go area. This will limit edge effects, erosion and sedimentation of the wetlands during the construction phase. » Contractor laydown areas, vehicle re-fuelling areas and material storage facilities to remain outside of the wetland areas and their associated 32 m NEMA Zone of Regulation (ZoR). » Any material stockpiled should be kept to a minimum. Should the vegetation not be suitable for reinstatement after the construction phase or be alien/invasive vegetation species, all material must be disposed of at a registered garden refuse site and may not be burned or mulched on site. 		
Residual impacts		

» Continued proliferation of alien vegetation as a result of construction activities

Nature: Installation of the pylons and stringing of the proposed power line within 500m of the cryptic wetlands resulting in soil disturbance and potential impacts on water quality

Installation of the pylons and stringing of the proposed power line within 500m of the cryptic wetlands will involve excavation of foundations for the pylons leading to stockpiling of soil, potential movement of construction equipment and personnel within the regulated area of watercourses and mixing and casting of concrete for foundations. This is likely to result in the following impacts to the cryptic wetlands:

- » Earthworks could be potential sources of sediment, which may be transported as runoff into the downstream wetland areas;
- » Disturbances of soil leading to potential impacts to wetland vegetation, increased alien vegetation proliferation in the footprint areas, and in turn to altered wetland habitat;
- » Altered runoff patterns, leading to increased erosion and sedimentation of the receiving wetlands down gradient of the development;
- » Dust pollution during construction which may impact on water quality; and
- » Potential contamination of surface water (if present).

	Without Mitigation	With Mitigation
Extent	Local (1)	Local (1)
Duration	Very short (1)	Very short (1)
Magnitude	High (6)	Low (4)
Probability	Highly Probable (4)	Improbable (2)
Significance	Medium (32)	Low (12)
Status	Negative	Negative
Reversibility	High	High
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	Yes	Yes

Mitigation

- » Construction works should ideally be undertaken during the dry, winter months when the flow is low in the watercourses, and no diversion of flow would be necessary.
- » The construction period should be kept as short as possible and construction activities within the delineated wetlands should be avoided.
- » Protect exposed stockpiles from wind and limit the time in which the stockpiled soil is exposed, by covering with a suitable geotextile such as hessian sheeting.
- » When the power line cables are strung between the pylons, no vehicles may indiscriminately drive through the wetlands. Use must be made of the dedicated access roads.

Control measures for concrete mixing on site:

- » No mixed concrete may be deposited outside of the designated construction footprint.
- » As far as possible, concrete mixing should be restricted to the contractor laydown area. Additionally, batter / dagga board mixing trays and impermeable sumps should be provided, onto which any mixed concrete can be deposited while it awaits placing.
- » Concrete spilled outside of the demarcated area must be promptly removed and taken to a suitably licensed waste disposal site.

With regards to backfilling of the concrete encasing:

- » Soil removed for excavating the pit should be used as backfill material.
- » All excavated pits must be compacted to natural soil compaction levels to prevent the formation of preferential surface flow paths and subsequent erosion. Conversely, areas compacted as a result of construction activities (within the 5 m buffer zone) must be loosened to natural soil compaction levels.

<ul style="list-style-type: none"> » Any remaining soil following the completion of backfilling of the pits are to be spread out thinly surrounding the installed pylon (outside wetlands) to aid in the natural reclamation process. » the construction footprint must be limited to the pit area (to allow for the stockpiling and movement of personnel). The area must be rehabilitated after the completion of the construction phase, including revegetation thereof with indigenous vegetation. In addition, alien vegetation eradication of the footprint area must be undertaken.
<p>Residual impacts</p> <ul style="list-style-type: none"> » Continued alternation of run-off patterns due to construction activities that took place

Operational Phase Impacts

<p>Nature: <u>Operation and maintenance of the power line resulting in soil disturbance, potentially altered water quality and increased susceptibility of sedimentation and erosion of cryptic wetlands</u></p>		
<p>The operation and maintenance of the powerline will involve potential indiscriminate movement of maintenance vehicles within close proximity of the wetlands and an increased risk of sedimentation and/or hydrocarbons entering the wetlands via stormwater runoff from the access roads This is likely to result in the following impacts to the cryptic wetlands:</p> <ul style="list-style-type: none"> » Disturbance to soil and ongoing erosion as a result of periodic maintenance activities; » Altered water quality (if surface water is present) as a result of increased availability of pollutants 		
	Without Mitigation	With Mitigation
Extent	Local (2)	Local (1)
Duration	Very short (1)	Very short (1)
Magnitude	Moderate (4)	Minor (2)
Probability	Highly Probable (4)	Improbable (2)
Significance	Medium (28)	Low (8)
Status	Negative	Negative
Reversibility	High	High
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	Yes	Yes
<p>Mitigation</p> <ul style="list-style-type: none"> » Maintenance vehicles must make use of dedicated access roads and no indiscriminate movement in the watercourses may be permitted. » During periodic maintenance activities of the power line, monitoring for erosion should be undertaken. » Should erosion be noted at the base of the pylon, the area must be rehabilitated by infilling the erosion gully and revegetation thereof with suitable indigenous vegetation. » Monitoring for the establishment of alien and invasive vegetation species must be undertaken, specifically where pylons are within close proximity (within 32 m) to the wetlands and for access roads through or along the watercourses. Should alien and invasive plant species be identified, they must be removed and disposed of as per an alien and invasive species control plan and the area must be revegetated with suitable indigenous vegetation. 		
<p>Residual impacts</p> <ul style="list-style-type: none"> » Continued soil erosion during operational and maintenance phases » Continued alternation of water quality 		

» 6.4.4 Implications of Project Implementation

Considering that the proposed infrastructure will be located outside of all delineated cryptic wetlands as well as their 32 m buffer (the power line alignment is located approximately 400 m to the closest cryptic wetland) poses a Low risk to the wetlands. Nevertheless, all mitigation measures as stipulated in must be implemented to prevent any negative edge effects from occurring to the wetlands.

6.5 Assessment of Impacts on Soils, Land Types and Agriculture Potential

The significance of the negative impacts on soil, land types and agricultural potential expected with the development of power line infrastructure has been assessed as low with the implementation of the mitigation measures. Potential impacts and the relative significance of the impacts are summarised below (refer to **Appendix G** for more details).

6.5.1. Results of the Soil, Agriculture Potential and Land Type Impact Assessment

The majority of the extent of the development area is located within the Ag110 land type (yellow-brown apedal soils) which has a shallow depth (less than 300mm) and high base status. A small extent is located within in the Ah9 (red and yellow apedal soils).

Based on the DEFF Land Capability and baseline findings, land capability and agricultural potential of the soil resources in the assessment corridor ranges from Very Low to Moderate.



Figure 6.3: Soils and land capability sensitivity of Hyperion-Kalbas 132kV powerline

The climatic restrictions (i.e. low annual rainfall and high evaporation rates) mean that the potential impacts would be relatively low, from the viewpoint of soils or agricultural potential. It was not envisaged that any further detailed soil investigation will be required.

6.5.2. Description of Soil, Agriculture Potential and Land Type Impacts

Impacts identified from a soils perspective include loss of land capability during the construction phase and to a lesser extent during the operational phase. During construction, development areas will be cleared of vegetation and topsoil. Although the construction phase has a short duration and land capability has been classified as low, the intensity of construction activities is relatively high. The loss of land capability during the operational phase can be controlled through best practice measures and alien invasive control.

6.5.3. Assessment of Potential Impacts

Construction Phase Impacts

Nature: <i>Loss of land capability and soils</i>		
	Without mitigation	With mitigation
Extent	Local (2)	Local (2)
Duration	Short term (2)	Short-term (2)
Magnitude	Moderate (6)	Moderate (6)
Probability	Probable (3)	Probable (3)
Significance	Medium (30)	Medium (30)
Status (positive or negative)	Negative	Negative
Reversibility	High	High
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	Yes	
Mitigation:		
» Limited mitigation will be relevant to the conservation of soil resources during construction of the proposed linear activities' servitudes given the fact that topsoil and vegetation will be stripped for foundation purposes.		
» All laydown yards must be constructed within the Glenrosa areas due to the fact that this soil form is characterised by a lower land capability and land potential than the other soil forms;		
» Prevent any spills from occurring. Machines must be parked within hard park areas and must be checked daily for fluid leaks; and		
» If a spill occurs, it is to be cleaned up immediately and reported to the appropriate authorities		
Residual Impacts:		
The residual impacts related to the relevant activities during the construction phase will remain the same as prior to mitigation, given the fact that mitigation will not decrease the significance of these impacts. Additionally, the land potential in the area has been determined as low therefore, reversibility will be practical.		

Operational Phase Impacts

Nature: <i>Loss of land capability</i>		
	Without mitigation	With mitigation
Extent	Local (2)	Local (2)
Duration	Permanent (5)	Permanent (5)
Magnitude	Minor (2)	Minor (2)
Probability	Improbable (2)	Improbable (2)
Significance	Low (16)	Low (16)

Status (positive or negative)	Negative	Negative
Reversibility	High	High
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	Yes	
Mitigation:		
» Limited mitigation will be relevant to the conservation of soil resources during operation of the linear activities given the fact that "Low" significance ratings have been calculated prior to mitigation. <ul style="list-style-type: none"> » Compacted areas are to be ripped to loosen the soil structure for the Hutton, Ermelo and Nkonkoni soil forms; » One main road extends from the dirt road crossing underneath the proposed power line, parallel with the proposed development, this road should be used as much as possible for the respective project phases 		
Residual Impacts:		
Limited mitigation will be relevant to the conservation of soil resources during operation of the linear activities given the fact that "Low" significance ratings have been calculated prior to mitigation.		

6.5.4. Implications of Project Implementation

The land capability sensitivities for the power line corridor area were identified to be Very Low to Moderate. Based on the outcomes of the assessment the agricultural production of the area will be negligibly impacted upon by the proposed project and no fragmentation of current agricultural activities will take place and that the general condition of the affected soil resources could be restored to a close to natural condition. The following general mitigation measures have however been specified:

- » Compacted areas are to be ripped to loosen the soil structure for the Hutton, Ermelo and Nkonkoni soil forms;
- » One main road extends from the dirt road crossing underneath the proposed power line, parallel with the proposed development, this road should be used as much as possible for the respective project phases;
- » All laydown yards must be constructed within the Glenrosa areas due to the fact that this soil form is characterised by a lower land capability and land potential than the other soil forms;
- » Prevent any spills from occurring. Machines must be parked within hard park areas and must be checked daily for fluid leaks; and
- » If a spill occurs, it is to be cleaned up immediately and reported to the appropriate authorities.

6.6 Assessment of Impacts on Heritage (including archaeological and palaeontological resources)

The significance of the negative impact on heritage, including archaeological, graves, and palaeontological resources expected within the development area have been assessed as low to moderate without mitigation and low with mitigation since no significant heritage resources were identified within the development area for the Hyperion-Kalbas 132kV power line (refer to **Appendix F** for more details).

6.6.1. Results of the Heritage and Palaeontological Impact Assessment

Palaeontology

The SAHRIS Palaeosensitivity Map (refer to Figure 6.4) indicates the area to be of moderate to high sensitivity. However, findings from other projects in the vicinity suggest that the area can be regarded as of generally low sensitivity with the possibility of small pockets of high sensitivity occurring in certain areas. The main

concern is likely to be the potential occurrence of mammalian remains in solution hollows in the calcrete or associated with old pan or vlei deposits along drainage lines.

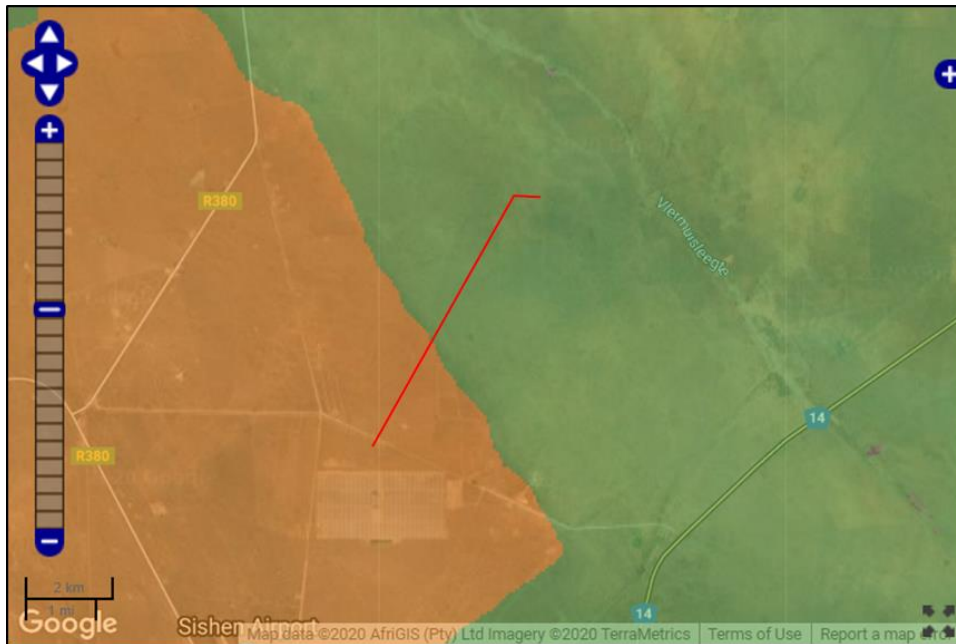


Figure 6.4: Extract from the SAHRIS Palaeosensitivity map showing the study area to be of moderate (green shading) to high (orange shading) sensitivity.

Archaeology

Archaeological materials are fairly widespread around Kathu and the area is best regarded as an archaeological landscape rather than a collection of individual sites. Observations from previous studies noted stone artefacts to be present beneath the cover sands and visible along the margins of the Vlermuisleegte. A small hill approximately 1.4 km southeast of the northern end of the assessment corridor was found to be an outcropping area of ironstone gravel with many associated artefacts. Closer to the corridor a very small gravel patch hosts a trigonometric beacon; it is likely that at least some of the gravel was brought to the surface during construction of the tower on which the beacon stands. Several artefacts were observed in this gravel as well. These observations prove that archaeological materials do occur beneath the aeolian sand. Near the Kalbas Substation Orton (2015) noted MSA artefacts scattered around two small pans. To the southwest of the Kalbas Substation Orton and Walker (2015) found calcrete exposed at the surface with artefacts virtually absent.

No site visit was undertaken for the proposed project as, based on the specialist's experience in the larger study area, it is envisaged that very little to no archaeology would have been present on the sandy surface, which is present in the northern section of the assessment corridor.

Graves

A set of 12-15 graves close to the Kathu Pan have been reported (Pelser, 2018). Graves have also been found 1.9km north of the proposed power line. There is also a chance that Stone Age or even Iron Age graves could be found in the area. However, it is unlikely that historical graves will occur in remote locations (i.e. away from farmsteads) such as the power line corridor.

Built Environment

The Langeberg Rebellion was an important historical event that occurred in the area. However, it was evident from aerial photographs that no historical or built heritage features occur along the proposed power line corridor.

Cultural Landscapes and Scenic Routes

The recent agricultural landscape of the project area is poorly developed and leaves a negligible cultural imprint on the landscape. Electrical developments (i.e. solar facilities and associated grid infrastructure) and mining dominate the broader landscape around the Kathu area. Due to these modern landscape uses, the overall cultural landscape has little to no heritage importance, and none of the roads in the area are considered scenic routes.

6.6.2. Description of Heritage Impacts (Including Archaeology and Palaeontology)

Potential heritage issues of concern for the proposed power line infrastructure establishment are palaeontology, archaeology and graves. The cultural landscape has shown little to no significance and does not require further assessment.

It must be noted that archaeological and palaeontological impacts are only expected to occur during the construction phase when groundworks are undertaken. No impacts are expected during the operation and decommissioning phases of the power line infrastructure.

6.6.3. Assessment of Potential Impacts

Nature: <u>Impact to palaeontological resources located within the development area.</u>		
Direct destruction of fossils during excavation of pylon foundations may occur. However, given the lack of known fossils in the area, overall impact significance is expected to be low.		
	Without mitigation	With mitigation
Extent	Local (1)	Local (1)
Duration	Permanent (5)	Permanent (5)
Magnitude	Low (2)	Low (2)
Probability	Improbable (1)	Improbable (1)
Significance	Low (20)	Low (8)
Status (positive or negative)	Negative	Negative
Reversibility	Low	Low
Irreplaceable loss of resources?	Yes	Yes
Can impacts be mitigated?	Yes	
Mitigation:		
<ul style="list-style-type: none"> » ECO, site foreman or other responsible person to inspect pylon foundations for any sign of fossils and also explain to workers the need to protect and report any fossils that are uncovered during development. » If fossils are found they must be protected in situ, the chance finds procedure must be implemented and the find must be reported to a palaeontologist or SAHRA for evaluation. If the chance finds procedure is implemented properly then this evaluation can often occur remotely. 		
Residual Impacts:		

Should any significant resources be impacted (however unlikely) residual impacts may occur, including a negative impact due to the loss of potentially scientific cultural resources.

Nature: *Impact to archaeological resources located within the development area.*

Direct destruction of archaeological materials during excavation of pylon foundations. Although there is a low chance of impacting archaeology of high significance, it is highly likely that some archaeology will be uncovered, specifically in the northern section of the power line corridor.

	Without mitigation	With mitigation
Extent	Local (1)	Local (1)
Duration	Permanent (5)	Permanent (5)
Magnitude	Moderate (6)	Minor (2)
Probability	Highly probable (4)	Very improbable (1)
Significance	Medium (48)	Low (8)
Status (positive or negative)	Negative	Negative
Reversibility	Low	Low
Irreplaceable loss of resources?	Yes	Yes
Can impacts be mitigated?	Yes	

Mitigation:

- » An archaeologist must inspect at least one third of the pylon foundation excavations and, if necessary, recommend judicious sampling in a few locations in order to establish the stratigraphy, density and significance of the artefactual materials.

Residual Impacts:

Given the widespread nature of the archaeology, if the above mitigation is applied, the potentially still extensive residual impacts will be of no concern.

Nature: *Impact to graves located within the development area.*

Direct destruction of graves during excavation of pylon foundations. Although impacts to graves are of high cultural significance, the probability of impacts occurring is very improbable and the resultant impact significance is low.

	Without mitigation	With mitigation
Extent	Local (1)	Local (1)
Duration	Permanent (5)	Permanent (5)
Magnitude	High (8)	Minor (2)
Probability	Very improbable (1)	Very improbable (1)
Significance	Low (14)	Low (8)
Status (positive or negative)	Negative	Negative
Reversibility	Low	Low
Irreplaceable loss of resources?	Yes	Yes
Can impacts be mitigated?	Yes	

Mitigation:

- » Workers should be instructed to be cautious about any graves that might be uncovered during excavation. If any are found work in the immediate vicinity should cease and the find must be reported to an archaeologist and/or SAHRA immediately. It is likely that an archaeologist will need to be contracted to remove the remains to safety.

Residual Impacts:

Because graves are easy to locate, even though they may be heavily disturbed during excavation, the chances of graves going completely unnoticed are very slim and residual impacts are thus highly unlikely.

6.6.4. Implications of Project Implementation

Based on the outcomes of the impact assessment the main impact for this project will be the potential to intersect archaeological resources during excavation of the pylon foundations. However, with appropriate mitigation, the impacts can be easily managed, and a scientific benefit could even be derived with successful description and rescue of heritage materials.

However, the potential impacts to heritage resources can be easily managed with implementation of appropriate mitigation measures, it is the opinion of the heritage specialist that the proposed powerline development should be authorised in full.

6.7 Assessment of Visual Impacts

Negative impacts on visual receptors will occur during the undertaking of construction activities and the operation of the Hyperion-Kalbas 132kV powerline. Potential impacts and the relative significance of the impacts are summarised below (refer to **Appendix I** for more details).

6.7.1. Results of the Visual Impact Assessment

The proposed power line is expected to have a very contained core area of visual exposure, generally restricted to a 0.5km - 3km radius of the site (refer to Figure 6.5). This is due to the generally constrained height of the 132kV power line structure (approximately 24m). The core area of visual exposure is restricted to the properties earmarked for infrastructure development and where the power line traverses the T25 secondary road before entering the Kalbas Substation.

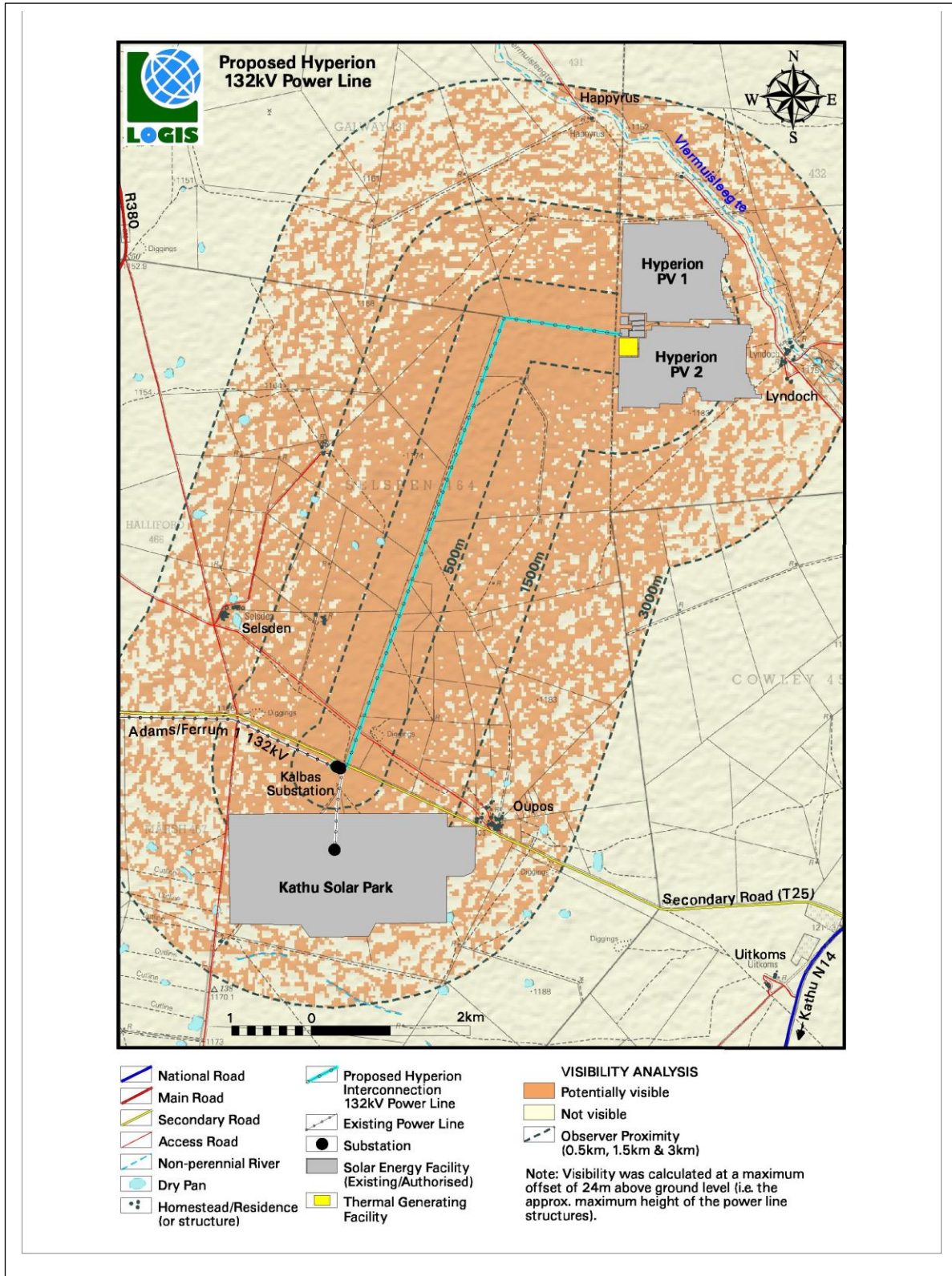


Figure 6.5: Map showing the Visual impact index and potentially affected sensitive visual receptors. The map illustrates the proposed the Hyperion-Kalbas 132kV power line in relation to potentially sensitive visual receptors.

Visibility beyond 0.5km is more scattered and interrupted due to the undulating nature of the topography. Travellers using the T25 road may however be impacted upon by visual exposure to the power line infrastructure. Additional sensitive visual receptors are located at farm residences (homesteads) within the 1.5km – 3km radius, however, are expected to experience visual impacts of low magnitude.

In general terms, it is envisaged that the structures, where visible from shorter distances (e.g. less than 3km), and where sensitive visual receptors may find themselves within this zone, may constitute a high visual prominence, potentially resulting in a high visual impact.

Given the remote location of the proposed infrastructure, this scenario is highly unlikely as observers in this zone are expected to be associated with the Hyperion Hybrid Facility, apart from the travellers from the T25 road, and therefore not sensitive to these developments and associated structures.

6.7.2. Description of the Visual Impacts

Visual impacts associated with the development of the proposed the Hyperion-Kalbas 132kV power line include the following:

- » Visual impact of construction activities on sensitive visual receptors (i.e. observers travelling along the roads and residents at homesteads) in close proximity to the proposed power line infrastructure.
- » Visual impact of the infrastructure during the operational phase on observers in close proximity (0.5km – 3km) to the structures.
- » The potential impact on the sense of place of the region.

6.7.3. Assessment of Potential Impacts

Construction, Operation and Decommissioning Phases

Nature: <i>Visual impact of construction activities on sensitive visual receptors in close proximity to the proposed power line infrastructure.</i>		
During construction, there may be a noticeable increase in heavy vehicles utilising the roads to the development site that may cause, at the very least, a visual nuisance to other road users and landowners in the area.		
	Without mitigation	With mitigation
Extent	Local (2)	Local (2)
Duration	Short term (2)	Short term (2)
Magnitude	Moderate (6)	Low (4)
Probability	Improbable (2)	Improbable (2)
Significance	Low (20)	Low (16)
Status (positive or negative)	Negative	Negative
Reversibility	Reversible (1)	Reversible (1)
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	Yes.	
Mitigation:		
Planning:		
» Retain and maintain natural vegetation immediately adjacent to the development footprint		
Construction:		
» Ensure that vegetation is not unnecessarily removed during the construction phase.		

- » Plan the placement of lay-down areas and temporary construction equipment camps in order to minimise vegetation clearing (i.e. in already disturbed areas) wherever possible.
- » Restrict the activities and movement of construction workers and vehicles to the immediate construction area and existing access roads.
- » Ensure that rubble, litter, and disused construction materials are appropriately stored (if not removed daily) and then disposed of regularly at licensed waste facilities.
- » Reduce and control construction dust using approved dust suppression techniques as and when required (i.e. whenever dust becomes apparent).
- » Restrict construction activities to daylight hours whenever possible in order to reduce lighting impacts.
- » Rehabilitate all disturbed areas immediately after the completion of construction works.

Residual Risks:

None, provided rehabilitation works are carried out as specified.

Nature: Visual impact on observers travelling along the roads and residents at homesteads within 0.5km to the power line structures

The power line is expected to have a limited impact on observers within a 0.5km radius of the power line structures. This is due to the limited number of potentially sensitive visual receptors brought about by the remote location of the infrastructure. The area of potential visual impact (i.e. where the power line crosses the secondary road near the Kalbas Substation) will also likely be overshadowed by the much larger Kathu Solar Park infrastructure.

	Without mitigation	With mitigation
Extent	Local (2)	Local (2)
Duration	Long term (4)	Long term (4)
Magnitude	Low (4)	Low (4)
Probability	Improbable (2)	Improbable (2)
Significance	Low (20)	Low (20)
Status (positive or negative)	Negative	Negative
Reversibility	Reversible (1)	Reversible (1)
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	No, only best practice measures can be implemented	

Mitigation:

Planning:

- » Retain/re-establish and maintain natural vegetation immediately adjacent to the powerline servitude.

Operations:

- » Maintain the general appearance of the infrastructure.

Decommissioning:

- » Remove infrastructure not required for the post-decommissioning use.
- » Rehabilitate all affected areas. Consult an ecologist regarding rehabilitation specifications.

Residual Risks:

The visual impact will be removed after decommissioning, provided the power line infrastructure is removed. Failing this, the visual impact will remain.

Nature: Visual impact on observers travelling along the roads and residents at homesteads within a 0.5 – 3km radius of the power line infrastructure

The anticipated visual impact on observers traveling along the roads and residents of homesteads within a 0.5 - 3km radius of the power line infrastructure is likely to be of low significance both before and after mitigation

	Without mitigation	With mitigation
Extent	Regional (3)	Regional (3)

Duration	Long term (4)	Long term (4)
Magnitude	Low (4)	Low (4)
Probability	Improbable (2)	Improbable (2)
Significance	Low (22)	Low (22)
Status (positive or negative)	Negative	Negative
Reversibility	Reversible (1)	Reversible (1)
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	No, only best practise measures can be implemented	
Mitigation:		
Planning:		
» Retain/re-establish and maintain natural vegetation immediately adjacent to the development footprint/power line servitude.		
Operations:		
» Maintain the general appearance of the infrastructure.		
Decommissioning:		
» Remove infrastructure not required for the post-decommissioning use.		
» Rehabilitate all affected areas. Consult an ecologist regarding rehabilitation specifications.		
Residual Impacts: The visual impact will be removed after decommissioning, provided that the power line infrastructure is removed. Failing this, the visual impact will remain.		

Nature: *The potential impact on the sense of place of the region.*

The anticipated visual impact of the proposed power line infrastructure on the regional visual quality, and by implication, on the sense of place, is difficult to quantify, but is generally expected to be of low significance. This is due to the relatively low viewer incidence within close proximity to the proposed power line and the presence of the existing electricity infrastructure.

	Without mitigation	With mitigation
Extent	Regional (3)	Regional (3)
Duration	Long term (4)	Long term (4)
Magnitude	Low (4)	Low (4)
Probability	Improbable (2)	Improbable (2)
Significance	Low (22)	Low (22)
Status (positive or negative)	Negative	Negative
Reversibility	Reversible (1)	Reversible (1)
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	No, only best practise measures can be implemented	
Mitigation:		
Planning:		
» Retain/re-establish and maintain natural vegetation immediately adjacent to the development footprint/servitude.		
Operations:		
» Maintain the general appearance of the servitude as a whole.		
Decommissioning:		
» Remove infrastructure not required for the post-decommissioning use.		
» Rehabilitate all affected areas. Consult an ecologist regarding rehabilitation specifications		
Residual impacts:		
The visual impact will be removed after decommissioning, provided the power line infrastructure is removed. Failing this, the visual impact will remain.		

» **6.7.4. Implications of Project Implementation**

Based on the outcomes of the impact assessment, the overall, the significance of the visual impacts is expected to range from moderate to low as a result of the generally undeveloped character of the landscape. No visual impacts of a high significance are expected to occur. If mitigation is implemented as recommended, it is concluded that the significance of most of the anticipated visual impacts will remain at or be managed to acceptable levels.

6.8 Assessment of Social Impacts

Positive and negative impacts on the social environment are expected during both the construction and operation phases. Potential social impacts and the relative significance of the impacts associated with the development of the Hyperion-Kalbas 132kV power line are summarised below (refer to **Appendix J**).

6.8.1. Results of the Social Impact Assessment

The construction phase of the power line is associated with the most social impacts. Many of the social impacts are unavoidable and will take place to some extent but can be managed through the careful planning and implementation of appropriate mitigation measures. Several potential positive and negative social impacts have been identified for the development. An assessment of the potential social impacts indicated that there are no perceived negative impacts that are sufficiently significant to allow them to be classified as "fatal flaws".

6.8.2. Description of the Social Impacts

The following positive and negative impacts have been identified and assessed for the power line infrastructure.

Positive and negative social impacts associated with the construction phase:

- » Annoyance, dust, noise
- » Increase in crime
- » Increased risk of HIV infections
- » An influx of construction workers
- » Hazard exposure
- » Disruption of daily living patterns
- » Disruption to social and community infrastructure
- » Socio-economic stimulation

Positive and negative social impacts associated with the operation phase:

- » Transformation of the sense of place
- » Socio-economic stimulation

6.8.3. Assessment of Potential Impacts

Construction Phase

Nature: <i>Annoyance dust and noise</i>		
Construction activities will result in disruptions and the generation of dust and noise from construction vehicles and equipment. Site-specific activities such as site clearance and the deliveries of materials, equipment, and the transportation of the workforce along unsealed access roads will generate the most dust and noise. Dust that accumulates on foliage and grasses that is used for grazing may result in that foliage and those grasses becoming unpalatable for livestock and/or game. This may in turn influence farming activities within the vicinity of the project site and along the access road over the construction period.		
	Without enhancement	With enhancement
Extent	Local (2)	Local- Regional (3)
Duration	Short term (1)	Short term (2)
Magnitude	Low (4)	Moderate (6)
Probability	Definite (5)	Highly probable (4)
Significance	Medium (35)	Medium (44)
Status (positive or negative)	Negative	Negative
Reversibility	Yes	Yes
Irreplaceable loss of resources?	No	
Can impacts be mitigated?	Yes	
Enhancement:		
<ul style="list-style-type: none"> » Wet gravel roads regularly or use other appropriate dust suppressant. » Ensure that vehicles used to transport sand and building materials are fitted with tarpaulins or covers. » Ensure all vehicles are roadworthy and drivers are qualified and made aware of the potential noise and dust issues. » Appoint a community liaison officer to deal with complaints and grievances from the public. 		
Residual impacts:		
<ul style="list-style-type: none"> » Dust may settle on vegetation discouraging livestock and game from browsing in the affected area. 		

Nature: <i>Increase in crime</i>		
The project straddles the Kuruman and Kathu police precincts. Both areas have a relatively high crime level as both precincts incorporate urban areas. Opportunistic crimes such as stock theft, the abuse of alcohol and relationship-related crimes could be associated with construction activities.		
	Without mitigation	With mitigation
Extent	Regional (2)	Regional (2)
Duration	Short term (1)	Short term (1)
Magnitude	Low (4)	Minor to Low (3)
Probability	Highly Probable (4)	Probable (3)
Significance	Low (28)	Low (18)
Status (positive or negative)	Negative	Negative
Reversibility	Yes	Yes
Irreplaceable loss of resources?	No	
Can impacts be mitigated?	Yes	
Enhancement:		
<ul style="list-style-type: none"> » Ensure that construction workers are clearly identifiable. All workers should carry identification cards and wear identifiable clothing. 		

<ul style="list-style-type: none"> » Fence off the construction site and control access to these sites (if possible). » Appoint an independent security company to monitor the site. » Appoint a community liaison officer. » Encourage local people to report any suspicious activity associated with the construction site to the community liaison officer. » A grievance mechanism must be prepared and communicated to surrounding landowners and local communities, to ensure that the project proponent, EPC Contractor, and sub-contractors remain responsible and accountable, and to facilitate the identification and implementation of additional mitigation measures if required. » Prevent loitering within the vicinity of the construction camp as well as construction sites by recruiting off-site in visa an offsite recruiting office/agent, whatever is most appropriate.
<p>Residual impacts:</p> <ul style="list-style-type: none"> » If crime levels do rise in the area due to the construction activities, it may take some time before they are restored to the previous low levels. » Depending on the crimes committed victims may suffer long-term effects as a result of their experience.

<p>Nature: <u>Increased risk of HIV infections</u></p> <p>This risk is likely to be at its highest during the construction phase of the project as the construction workforce increases and material and equipment are delivered to site. Due to the relatively low prevalence of HIV in the area and the risks associated with construction and transport workers, it is important that this issue is given serious attention and that the appropriate mitigation measures are implemented, and the situation is closely monitored</p>		
	Without mitigation	With mitigation
Extent	Regional (4)	Regional (4)
Duration	Long-term (4)	Long-term (4)
Magnitude	Moderate to High (7)	Moderate (6)
Probability	Highly Probable (4)	Probable (3)
Significance	High (60)	Medium (42)
Status (positive or negative)	Negative	Negative
Reversibility	Yes	
Irreplaceable loss of resources?	Yes	
Can impacts be mitigated?	Yes	
<p>Mitigation:</p> <ul style="list-style-type: none"> » Ensure that an onsite HIV and AIDS policy is in place and that construction workers are expose to a health and HIV/AIDS awareness educational programme within the first month of construction. » Provide voluntary and free counselling, free testing and condom distribution services to the workforce. » Where feasible extend the HIV/AIDS programme into the community with a specific focus on schools and youth clubs. 		
<p>Residual impacts:</p> <ul style="list-style-type: none"> » The area currently has a relatively low HIV prevalence rate and any increase in this rate would have serious consequences that could last over an extended period. » People contracting HIV and their families will suffer life-changing consequences. 		

<p>Nature: <u>Influx of construction workers</u></p> <p>The influx of construction workers could have an impact on the family structures and social networks of local communities (e.g. alcohol and drug use, prostitution, spreading of sexually transmitted diseases etc.). This is particularly relevant in situations where workers are accommodated amongst local communities and/or where they frequent the same recreational facilities as local communities</p>

	Without mitigation	With mitigation
Extent	Regional (2)	Regional (2)
Duration	Short term (1)	Short term (1)
Magnitude	Low (4)	Low to Minor (3)
Probability	Probable (4)	Probable (3)
Significance	Low (28)	Low (18)
Status (positive or negative)	Negative	Negative
Reversibility	Yes	
Irreplaceable loss of resources?	No	
Can impacts be mitigated?	Yes	
Mitigation:		
<ul style="list-style-type: none"> » Communicate the limitation of opportunities created by the project through Community leaders and Ward Councillors to prevent an influx of job seekers. » Develop and implement a local procurement policy which prioritises "locals first" to prevent the movement of people into the area in search of work. » Draw up a recruitment policy in conjunction with the Community Leaders and Ward Councillors of the area and ensure compliance with this policy. 		
Residual impacts:		
<ul style="list-style-type: none"> » There is the risk that some workers remain in the area in the hope of finding employment with other projects planned for the region. This risk is, however, reduced as most workers will be recruited locally. 		

Nature: <u>Hazard exposure</u>		
<p>The use of heavy equipment and vehicles and an increase in vehicle traffic within the vicinity of all construction sites will result in an increased risk to the personal safety of people and animals. There will also be an increased risk of fires due to the likelihood of construction workers lighting fires for cooking and warmth during cold periods. Nevertheless, with the recommended mitigation measures being successfully put in place this can be controlled.</p>		
	Without mitigation	With mitigation
Extent	Regional (2)	Regional (2)
Duration	Short term (1)	Short term (1)
Magnitude	Low (4)	Minor to Low (3)
Probability	Highly Probable (4)	Highly Probable (4)
Significance	Low (28)	Low (24)
Status (positive or negative)	Negative	Negative
Reversibility	Yes	
Irreplaceable loss of resources?	No	
Can impacts be mitigated?	Yes	
Mitigation:		
<ul style="list-style-type: none"> » Ensure all construction equipment and vehicles are properly maintained at all times. » Ensure that operators and drivers are properly trained and make them aware, through regular toolbox talks, of any risk they may pose to the community. Place specific emphasis on the vulnerable sector of the population such as children and the elderly. » Ensure that fires lit by construction staff are only ignited in designated areas and that the appropriate safety precautions, such as not lighting fires in strong winds and completely extinguishing fires before leaving them unattended, are strictly adhered to. » Make staff aware of the dangers of fire during regular toolbox talks. » A grievance mechanism must be prepared and communicated to surrounding landowners and local communities, to ensure that the project proponent, EPC Contractor, and sub-contractors remain responsible and accountable, and to facilitate the identification and implementation of additional mitigation measures if required. 		

<ul style="list-style-type: none"> » Where necessary training should be provided on the implementation of the grievance mechanism to ensure that those who are most likely to be affected by the project are suitably knowledgeable on how to raise concerns and have these addressed. » Compile and implement a Fire Management and Emergency Preparedness and Response Plan.
<p>Residual impacts:</p> <ul style="list-style-type: none"> » With an increased risk of hazard exposure, there is the possibility that people may be injured or killed which will place a burden on their families.

<p>Nature: <u>Disruption of daily living patterns</u></p> <p>Disruptions to daily living patterns are likely to be minimal and restricted to the construction phase of the project. These disruptions are only likely to be associated with the delivery of materials and machinery to site and the transportation of workers to and from the site.</p>		
	Without mitigation	With mitigation
Extent	Regional (2)	Regional (2)
Duration	Short-term (1)	Short-term (1)
Magnitude	Low (4)	Minor to Low (3)
Probability	Highly probable (4)	Highly Probable (4)
Significance	Low (28)	Low (24)
Status (positive or negative)	Negative	Negative
Reversibility	Yes	
Irreplaceable loss of resources?	No	
Can impacts be mitigated?	Yes	
<p>Mitigation:</p> <ul style="list-style-type: none"> » Ensure that, at all times, people have access to their properties as well as to social facilities. » All vehicles must be roadworthy, and drivers must be qualified, obey traffic rules, follow speed limits and be made aware of the potential road safety issues. » Heavy vehicles should be inspected regularly to ensure their road safety worthiness. » Avoid heavy vehicle activity during "peak" hours (when children are taken to school, or people are driving to work). » The developer and EPC Contractor must ensure that the roads utilised for construction activities are either maintained in the present condition or upgraded if damaged due to construction activities. 		
<p>Residual impacts:</p> <ul style="list-style-type: none"> » It is unlikely that any disruption of community patterns will persist after construction. 		

<p>Nature: <u>Disruption to social and community infrastructure</u></p> <p>Unlikely that in isolation the project will have any significant effect on social and community infrastructure in the area.</p>		
	Without mitigation	With mitigation
Extent	Regional (3)	Local (1)
Duration	Short-term (1)	Short-term (1)
Magnitude	Low (4)	Minor to Low (3)
Probability	Improbable (2)	Improbable (2)
Significance	Low (16)	Low (14)
Status (positive or negative)	Negative	Negative
Reversibility	Yes	
Irreplaceable loss of resources?	No	
Can impacts be mitigated?	Yes	
<p>Mitigation:</p>		

<ul style="list-style-type: none"> » Regularly monitor the effect that construction is having on infrastructure and immediately report any damage of infrastructure to the appropriate authority. » Ensure that where communities' access is obstructed that this access is swiftly restored to an acceptable state.
<p>Residual impacts:</p> <ul style="list-style-type: none"> » If disrupted social and community infrastructure is not swiftly restored there is a risk that local communities may experience an extended loss in this respect.

<p>Nature: <i>Job creation and skills development</i></p>		
<p>In this regard, there are approximately 50 direct jobs associated with the construction phase of the project. Of these, approximately 60% will be for low and non-skilled workers with ~24% going to semi-skilled and ~16% to skilled workers.</p>		
	Without mitigation	With mitigation
Extent	Regional (3)	Regional (3)
Duration	Short-term (1)	Short-term (1)
Magnitude	Minor to Low (3)	Minor to Low (3)
Probability	Highly probable (4)	Highly probable (4)
Significance	Low (28)	Low (28)
Status (positive or negative)	Positive	Positive
Reversibility	Yes	
Irreplaceable loss of resources?	No	
Can impacts be mitigated?	Yes	
<p>Mitigation:</p> <ul style="list-style-type: none"> » Wherever feasible, local residents should be recruited to fill semi and unskilled jobs. » Women should be given equal employment opportunities and encouraged to apply for positions. » A skills transfer plan should be put in place at an early stage and workers should be given the opportunity to develop skills which they can use to secure jobs elsewhere post-construction. » A procurement policy promoting the use of local business should, where possible, be put in place and applied throughout the construction phase. » As far as possible local contractors that are compliant with Broad-Based Black Economic Empowerment (B-BBEE) criteria should be used. 		
<p>Residual impacts:</p> <ul style="list-style-type: none"> » Job creation and skills development may help in addressing poverty and low living standards in the region and improve skills and experience in the local area. 		

<p>Nature: <i>Socio-economic development</i></p>		
<p>This contribution will be in the form of disposable salaries and the purchases of services and supplies from the local communities in and around the region. Projects which form part of the DoE's RMIPPP Programme are required as part of their bidding requirements to contribute towards local economic development (LED) and social upliftment initiatives within the area in which they are proposed. The proposed development, therefore, has the potential to contribute positively towards socio-economic development and improvements within the local area.</p>		
	Without mitigation	With mitigation
Extent	Regional (2)	Regional (2)
Duration	Short-term (1)	Short-term (1)
Magnitude	Low (4)	Low (4)
Probability	Highly probable (5)	Highly probable (5)
Significance	Medium (35)	Medium (35)
Status (positive or negative)	Positive	Positive
Reversibility	Yes	

Irreplaceable loss of resources?	No
Can impacts be mitigated?	Yes
Mitigation:	
<ul style="list-style-type: none"> » A procurement policy promoting the use of local business should, where possible, be put in place to be applied throughout the construction phase. » A database of local companies, specifically Historically Disadvantaged Individuals (HDIs) which qualify as potential service providers (e.g. construction companies, security companies, catering companies, waste collection companies, transportation companies etc.) should be created and companies listed thereon should be invited to bid for project-related work where applicable. 	
Residual impacts:	
<ul style="list-style-type: none"> » The project could assist in upgrading the skills of local community members and growth in local business. 	

Operation Phase

Nature: <u>Transformation of the sense of place</u>		
Power lines are highly visible and often local communities perceive these structures as having a negative impact on the landscape. With respect to this proposed power line, it is also related to the delivery of renewable energy to some extent which has been found to have mixed reaction in terms of visual impacts.		
	Without mitigation	With mitigation
Extent	Regional (4)	Regional (4)
Duration	Long term (4)	Long-term (4)
Magnitude	Low to moderate (5)	Low to Moderate (5)
Probability	Highly probable (5)	Highly probable (4)
Significance	High (65)	High (65)
Status (positive or negative)	Negative	Negative
Reversibility	Yes	
Irreplaceable loss of resources?	No	
Can impacts be mitigated?	Yes	
Enhancement:		
<ul style="list-style-type: none"> » Apply the mitigation measures suggested in the Visual Impact Assessment Report. » Communicate the benefits associated with renewable energy to the broader community. » Ensure that all affected landowners and tourist associations are regularly consulted. » A Grievance Mechanism should be put in place and all grievances should be dealt with transparently. » The mitigation measures recommended in the Visual and Heritage and Palaeontology Impact Assessments should be followed. 		
Residual impacts:		
<ul style="list-style-type: none"> » Once the project has been decommissioned it will take some time and effort to restore the area's original sense of place. 		

Nature: <u>Socio-economic stimulation</u>		
This contribution will be in the form of disposable salaries and the purchases of services and supplies from the local communities in and around the region Projects which form part of the DoE's RMIPPP Programme are required as part of their bidding requirements to contribute towards local economic development (LED) and social upliftment initiatives within the area in which they are proposed. The proposed development, therefore, has the potential to contribute positively towards socio-economic development and improvements within the local area.		
	Without enhancement	With enhancement

Extent	Regional (4)	Regional (4)
Duration	Long term (4)	Long-term (4)
Magnitude	Low to Moderate (5)	Moderate (6)
Probability	Highly probable (5)	Highly probable (5)
Significance	High (65)	High (70)
Status (positive or negative)	Positive	Positive
Reversibility	Yes	
Irreplaceable loss of resources?	No	
Can impacts be mitigated?	Yes	
Mitigation/Enhancement:		
<ul style="list-style-type: none"> » Ensure that the procurement policy supports local enterprises. » Establish a social responsibility programme either in line with the RMIPPPP BID guidelines or equivalent. » Work closely with the appropriate municipal structures with regard to establishing a social responsibility programme. » Ensure that any trusts or funds are strictly managed in respect of outcomes and funds. 		
Residual impacts:		
<ul style="list-style-type: none"> » The project could assist in upgrading the skills of local community members and in strengthening the national grid 		

6.8.4. Implications of Project Implementation

Based on the outcomes of the impact assessment most impacts associated with the project apply over the short term, in respect of the construction phase, and can be mitigated to within an acceptable range. Enhancement measure for positive socio-economic effects associated with the project are as follows:

- » Wherever feasible, local residents should be recruited to fill semi and unskilled jobs;
- » Women should be given equal employment opportunities and encouraged to apply for positions;
- » A skills transfer plan should be put in place at an early stage and workers should be given the opportunity to develop skills which they can use to secure jobs elsewhere post-construction;
- » A procurement policy promoting the use of local business should, where possible, be put in place and applied throughout the construction phase;
- » As far as possible local contractors that are compliant with Broad-Based Black Economic Empowerment (B-BBEE) criteria should be used.

6.9 Assessment of the 'Do Nothing' Alternative

The "do-nothing" alternative (i.e. no go alternative) is the option of not constructing the Hyperion-Kalbas 132kV power line. This means that the status quo of the environment would remain unchanged and no impacts would occur. The implementation of the 'do-nothing' alternative will result in the Hyperion Hybrid Facility not being able to evacuate the generated electricity to the national grid and will, therefore, render the development of the associated facilities and the operation thereof not feasible. This could result in the loss of the opportunity to develop the Hyperion Hybrid Facility, which could have impacts at a national scale.

In addition, the Northern Cape Province will not benefit from additional generated power being evacuated through the proposed grid infrastructure directly into the Province's grid. Therefore, from a regional perspective, the 'do-nothing' alternative is not preferred as there is a perceived loss of benefits for the regional area.

This would result in negative impacts at a local, regional and national scale from a socio-economic and economic perspective and is not considered desirable. The negative impacts of the "Do Nothing" alternative is considered to outweigh the positive impacts of this alternative. The 'Do nothing' alternative is, therefore, not a preferred alternative.

CHAPTER 7: ASSESSMENT OF POTENTIAL CUMULATIVE IMPACTS

As identified and assessed in Chapter 6, the development of the grid infrastructure may have impacts (positive and negative) on natural resources, the social environment and on the people living in the area surrounding the project. The preceding impact assessment chapter has reported on the assessment of the impacts associated with the Hyperion-Kalbas 132kV power line in isolation from other similar developments. This chapter assesses the potential for the impacts associated with the power line to become more significant when considered in combination with the other known or proposed projects within the area.

The grid corridor is proposed within the Northern Strategic Transmission Corridor. The location of the grid corridor is in close proximity to a number of other proposed, approved, and operational power lines, which in some cases is associated infrastructure for other renewable energy developments within the area.

7.1 Legal Requirements as per the EIA Regulations, 2014 (as amended), for the undertaking of a Basic Assessment Report

This chapter of the Basic Assessment Report includes the following information required in terms of Appendix 1: Content of Basic Assessment Reports:

Requirement	Relevant Section
3(j)(i) an assessment of each identified potentially significant impact and risk, including cumulative impacts.	The cumulative impacts associated with the development of the Hyperion-Kalbas 132kV powerline are included and assessed within this chapter.

7.2 Approach taken to Assess Cumulative Impacts

The cumulative impacts of the proposed grid connection infrastructure have been assessed through the consideration of other existing grid connection infrastructure located within the vicinity of the grid connection corridor, as well as other industrial type infrastructure which have resulted in vertical and/or horizontal disturbance within the landscape surrounding the proposed project.

It is important to explore the potential for cumulative impacts as this will lead to a better understanding of these impacts and the potential for mitigation that may be required. The scale at which the cumulative impacts are assessed is important. For the development of the proposed grid connection infrastructure, the existing infrastructure and transformation in the directly surrounding areas will be considered which includes the following (refer to **Figure 7.1 and Table 7.1**):

- » The existing Kalbas substation;
- » The existing Kathu solar facility;
- » The authorised Hyperion PV solar energy facility; and
- » The proposed Hyperion Hybrid Facility

Table 7.1: Grid connection developments located within the surrounding area of the Hyperion-Kalbas 132kV power line corridor

Project Name	Project Status
Ferrum/Umtu 1 400kV	Existing

Ferrum/Umtu 1 132kV	Existing
Ferrum/Fox 1 132kV	Existing
Ferrum/Asbes 1 666kV	Existing
Ferrum/Nieuwehoop 1 400kV	Existing
Mookodi/Ferrum 1 400kV	Existing
Olien/Ferrum 1 275kV	Existing
Kathu CSP Power line	Existing

The cumulative impacts of the other known existing grid infrastructure and the proposed Hyperion-Kalbas power line are qualitatively assessed in this Chapter, and have been considered within the specialist studies (refer to **Appendices D - J**) The following potential impacts are considered for assessment:

- » Cumulative impacts on ecological processes;
- » Cumulative impacts on avifauna;
- » Cumulative impacts on heritage resources;
- » Cumulative visual impacts; and
- » Cumulative social impacts.

Based on the findings of specialist studies cumulative impacts were not discussed for the following impacts:

- » Aquatic Resources: Since no infrastructure associated with the proposed Hyperion-Kalbas 132kV power line is located within any of the identified cryptic wetlands, the significance of the cumulative impacts of the proposed project are regarded to be insignificant. The development of the power line will not result in an unacceptable risk to freshwater resources as it will easily avoid direct impacts on the identified wetland features through appropriate design. Therefore, the proposed development will not add to the cumulative impacts in the area.
- » Soils and Agricultural Resources: The proposed development of the Hyperion-Kalbas 132kV power line is considered a viable land use option for an area that has been characterised by low rainfall in that significantly limits the agricultural potential of the area. The agricultural production and land and soil capability (i.e. susceptibility to erosion) of the area will be negligibly impacted upon by the proposed project. Thus, no cumulative impacts have been identified or assessed

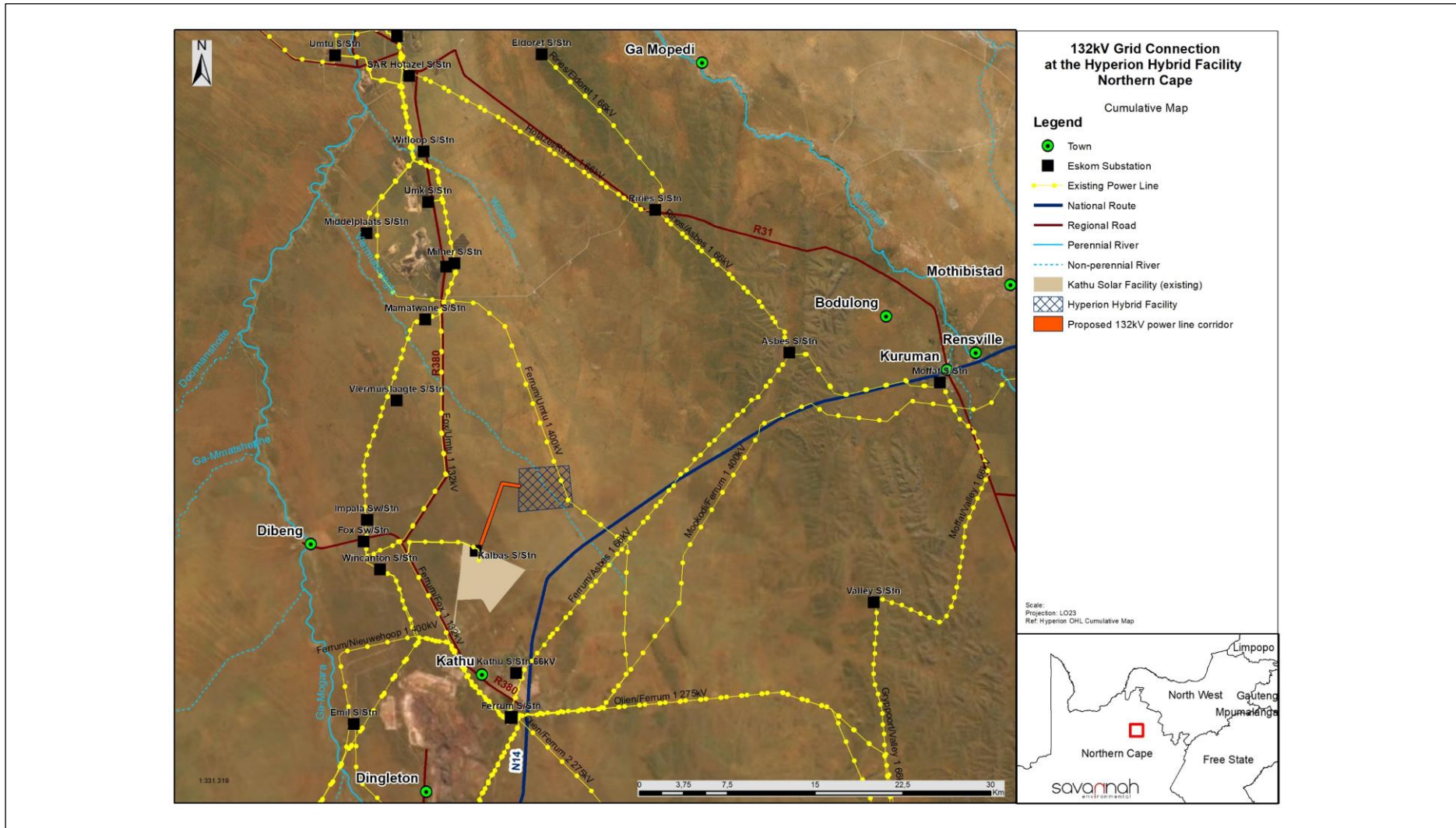


Figure 7.1: Identified grid connection infrastructure developments located within the surrounding areas of the Hyperion-Kalbas 132kV power line corridor considered as part of the cumulative impact assessment.

7.3 Cumulative impacts on Ecology

Cumulative ecological impacts have been identified for the Hyperion-Kalbas 132kV power line (refer to **Appendix D**). From an ecological perspective, the cumulative impacts associated with the proposed development area are expected to be of medium significance.

Nature: <i>Impact on protected species and associated habitats due to cumulative loss and fragmentation of habitat.</i> The development of the power line will contribute to cumulative floral impacts which relates to impact on species diversity and their associated habitats.		
	Overall impact of the proposed project considered in isolation	Cumulative impact of the project and other projects in the area
Extent	Local (1)	Local (2)
Duration	Very short (1)	Permanent (5)
Magnitude	Low (4)	Low to Moderate (5)
Probability	Probable (3)	Probable (3)
Significance	Low (18)	Medium (38)
Status (positive or negative)	Negative	Negative
Reversibility	Moderate	Moderate
Irreplaceable loss of resources?	Low	Low
Can impacts be mitigated?	The cumulative impacts of the proposed project can be mitigated if mitigation measures are implemented, e.g. vegetation maintenance, AIP clearing and prevention and/or control of bush encroachment (to name a few). However, longer-term cumulative impacts are more likely to result from other developments in the area that will result in larger areas of vegetation clearing.	
Mitigation:		
<ul style="list-style-type: none"> » Several Protected plant taxa that are protected under Schedule 2 (Protected Species) of the Northern Cape Nature Conservation Act (Act No. 9 of 2009) have the potential to be found within the study area. As such, if any such species are removed and relocated as part of the construction activities, the success of relocation must be monitored during the operational phase to ensure as a higher probability of success. Negative cumulative impacts on SCC can be lowered if harvesting of SCC is prevented and where feasible, this should be an important long-term management goal. » Linear developments are often corridors along which disturbances occur and AIPs spread. The proposed project should thus manage disturbances and AIPs along the entire extent as well as within a 30 m buffer surrounding the power line. This will decrease the potential for AIPs to become a significant threat to indigenous flora. » Bush encroachment should be managed to avoid a further cumulative loss of favourable habitat for floral communities in the area. » All soils compacted because of maintenance activities should be ripped and reprofiled to natural levels and revegetated with indigenous vegetation. Establishment of reintroduced vegetation within such disturbed areas must be monitored as part of maintenance activities to ensure no cumulative loss of floral habitat. » No dumping of waste should take place during maintenance activities, especially not within any sensitive habitat or areas designated as "open space." » Vehicles should be restricted from travelling in sensitive environments. Use must be made of existing roads only. Where possible, monitoring and maintenance should occur on foot. 		

7.4 Cumulative Impacts on Avifauna

Cumulative impacts on avifauna have been identified for the Hyperion-Kalbas 132kV power line (refer to **Appendix E**). From an avifauna perspective, the cumulative impacts associated with the proposed development area is of medium significance.

Nature: <i>Impact on avifaunal habitat, species diversity and abundance due to cumulative loss of habitat, increased risk of bird strikes with the overhead lines and tower structures as well as increased electrocution risks.</i>		
	Overall impact of the proposed project considered in isolation	Cumulative impact of the project and other projects in the area
Extent	Local (1)	Local (2)
Duration	Long-term (4)	Long-term (4)
Magnitude	Low (4)	Moderate (6)
Probability	Probable (3)	Probable (3)
Significance	Low (27)	Medium (36)
Status (positive or negative)	Negative	Negative
Reversibility	Moderate	Moderate
Irreplaceable loss of resources?	Low	Low
Can impacts be mitigated?	The impacts can be mitigated to some degree if mitigation measures are implemented. However, given the presence of the power line and other associated developments within the area, the long-term impacts associated thereof cannot be fully mitigated.	
Mitigation:		
<ul style="list-style-type: none"> » Appropriate anti-collision devices (bird-flappers) must be placed along the OHPL at appropriate intervals so as to deter/ minimise bird strikes with the power line. » Anti-roosting spikes/ structures must be placed on pylons where birds may perch or attempt to construct nests. » Bird-flappers should be of alternating colours so as to increase visibility, they should also not be of similar colour to the surrounding environment, as this may cause them to blend in and negates their functions. » Regular monitoring of the OHPL should take place to gather information about the occurrence and frequency of bird strikes/ electrocutions as well as which species are more prone to these. This data must be used to inform and adapt methods to avoid this from happening in the future. 		

7.5 Cumulative Impacts on Heritage (including archaeology and palaeontology)

Cumulative heritage impacts have been identified for the Hyperion-Kalbas 132kV power line (refer to **Appendix F**). From a heritage perspective, the cumulative impacts associated with the proposed development area medium.

Nature: <i>Destruction and/or damage to heritage resources</i>		
The principle driver of cumulative impacts is archaeology. The addition of multiple grid connection developments and related infrastructure can result in destruction of heritage resources.		
	Overall impact of the proposed project considered in isolation	Cumulative impact of the project and other projects in the area
Extent	Regional (3)	Regional (4)
Duration	Permanent (5)	Permanent (5)
Magnitude	Minor (2)	Moderate (6)
Probability	Probable (3)	Highly probable (4)
Significance	Medium (30)	Medium (6)
Status (positive or negative)	Negative	Negative

Reversibility	Low	Low
Irreplaceable loss of resources?	Yes	Yes
Can impacts be mitigated?	Yes	
Mitigation: Monitoring of excavations with sampling of artefacts where necessary and also protection and reporting of chance finds for further actions as needed.		

7.6 Cumulative Visual Impacts

Cumulative visual impacts have been identified and assessed for the proposed grid connection (refer to **Appendix I**).

The development of the Hyperion-Kalbas 132kV power line will add to the industrial infrastructure in the area. Although there is relatively low viewer incidence, the cumulative visual impacts associated with the proposed and existing grid connection infrastructure are likely to affect travellers on the T25 secondary road and surrounding farm residences.

Nature: <i>The potential cumulative visual impact of the grid infrastructure on the visual quality of the landscape.</i>		
The anticipated cumulative visual impact of the proposed grid infrastructure is expected to be of moderate significance, which is considered to be acceptable from a visual perspective. This is once again due to the relatively low viewer incidence within close proximity to the proposed development corridor		
	Overall impact of the proposed project considered in isolation	Cumulative impact of the project and other projects in the area
Extent	Local (2)	Regional (3)
Duration	Long term (4)	Long term (4)
Magnitude	Low (4)	High (8)
Probability	Improbable (2)	Probable (3)
Significance	Low (20)	Moderate (45)
Status (positive or negative)	Negative	Negative
Reversibility	Reversible (1)	Reversible (1)
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	No, only best practice measures can be implemented	
Mitigation:		
<u>Planning:</u>		
» Retain/re-establish and maintain natural vegetation immediately adjacent to the development footprint/servitude.		
<u>Operations:</u>		
» Maintain the general appearance of the servitude as a whole.		
<u>Decommissioning:</u>		
» Remove infrastructure not required for the post-decommissioning use.		
» Rehabilitate all affected areas.		
» Consult an ecologist regarding rehabilitation specifications.		

7.7 Cumulative Social Impacts

The potential for social cumulative impacts is likely and includes both positive and negative impacts (refer to **Appendix J**). The significance of the negative and positive cumulative impacts of the Hyperion-Kalbas 132kV power line and other projects in the area is medium. This is based on the location of the within an area already influenced by energy related projects. Considering the concentration of grid connection

infrastructure within the surrounding area of the proposed grid connection infrastructure, the potential for cumulative impacts to occur is likely.

Nature: <u>Risk of HIV</u>		
With the influx of labour, particularly following the construction of the proposed Hyperion Hybrid Facility grid connection infrastructure and various renewable energy and mining projects within the region, the risk of HIV infections in the area is likely to rise significantly.		
	Overall impact of the proposed project considered in isolation	Cumulative impact of the project and other projects in the area
Extent	Regional (4)	Regional (4)
Duration	Long term (4)	Long term (4)
Magnitude	Moderate (6)	High (8)
Probability	Probable (3)	Highly Probable (4)
Significance	Medium (42)	High (64)
Status (positive or negative)	Negative	Negative
Reversibility	Yes	Yes
Irreplaceable loss of resources?	Yes	Yes
Can impacts be mitigated?	Yes	
Mitigation/Enhancement:		
Mitigation can only be implemented at a regional level and will need to be driven on a provincial and municipal basis. In this sense, the following mitigation measures would need to be considered.		
<ul style="list-style-type: none"> » Ensure that all companies coming into the area have and are implementing an effective HIV/AIDS policy. » Introduce HIV/ADS awareness programs to schools and youth institutions. » Carefully monitor and report on the HIV status of citizens in the region. » Be proactive in dealing with any increase in the HIV prevalence rate in the area. 		

Nature: <u>Increase in crime</u>		
It is possible that due to increased construction activities in the area the perception may be created that there is an associated increase in job opportunities. Consequently, the increase in crime associated with developments in the area becomes a risk on a cumulative basis.		
	Overall impact of the proposed project considered in isolation	Cumulative impact of the project and other projects in the area
Extent	Regional (2)	Regional (5)
Duration	Short-term (1)	Long term (4)
Magnitude	Low (3)	Moderate (6)
Probability	Probable (3)	Highly Probable (4)
Significance	Low (18)	Medium to High (60)
Status (positive or negative)	Negative	Negative
Reversibility	Yes	Yes
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	Yes	
Mitigation:		
<ul style="list-style-type: none"> » Encourage contractors and local people to report any suspicious activity associated with crime to the appropriate authorities. » Ensure that the local municipalities, police, security companies, and policing forums are alerted to the increased construction activities in the region and the risk it poses in respect of crime. » Prevent loitering within the vicinity of the construction camp as well as construction sites. 		

- » Manage the growth of informal settlements that may arise as a response to growing job opportunities by promptly alerting the appropriate authorities.
- » Set up a community forum consisting of contractors, local and national government officials.

Nature: *Transformation of Sense of Place*

With the number of PV facilities, sub-stations and transmission lines in the vicinity the sense of place of the area is transforming from what had more of a rural farming aura to take on more of an industrial character. The project, considered along with the various other projects in the area, is likely to accelerate this transformation thus changing the sense of place of the region.

	Overall impact of the proposed project considered in isolation	Cumulative impact of the project and other projects in the area
Extent	Regional (4)	Regional (4)
Duration	Long-term (1)	Long term (4)
Magnitude	Low moderate (3)	High (8)
Probability	Highly Probable (3)	Highly Probable (4)
Significance	High (65)	High (80)
Status (positive or negative)	Negative	Negative
Reversibility	Yes	Yes
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	Yes	

Mitigation:

Mitigation can only be implemented at a regional level and will need to be driven on a provincial and municipal basis. In this sense, the following mitigation measures would need to be considered.

- » Consider undertaking a cumulative impact assessment to evaluate the changes taking place across the area on a broader scale.
- » Form a regional workgroup tasked with addressing the effect of changes to the sense of place of the region.
- » Establish grievance mechanisms to deal with complaints associated with changes to the area.
- » Enlighten the public about the need and benefits of renewable energy.
- » Engage with tourism businesses and authorities in the region to identify any areas of cooperation that may exist.

Nature: *Disruption of service, supplies and infrastructure*

With the proliferation of energy facilities in the area, it is likely that the local authorities, currently hard-pressed to deliver services due largely to the growth in mining activities in the area, according to the Gamagara LM IDP 2017 – 2022, will find it difficult to keep up with these developments. The influx of construction workers is likely to place pressure on accommodation and the need for both services and supplies.

	Overall impact of the proposed project considered in isolation	Cumulative impact of the project and other projects in the area
Extent	Regional (2)	Regional (4)
Duration	Short-term (1)	Long-term (4)
Magnitude	Minor to Low (3)	Moderate to High (7)
Probability	Highly Probable (3)	Highly Probable (4)
Significance	Low (24)	High (60)
Status (positive or negative)	Negative	Negative
Reversibility	Yes	Yes
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	Yes	

Mitigation:

Mitigation can only be implemented at a regional level and will need to be driven on a provincial and municipal basis. In this sense, the following mitigation measures would need to be considered.

- » Engage with the municipal authorities to ensure that they are aware of the expansion planned for the area and the possible consequences of this expansion.
- » Ensure that local labour is recruited in respect of these developments in the area.

Nature: Economic

The proliferation of energy facilities and associated grid infrastructure within the region is likely to result in significant and positive cumulative impacts in the area in terms of both direct and indirect job creation, skills development, training opportunities, and the creation of business opportunities for local businesses

	Overall impact of the proposed project considered in isolation	Cumulative impact of the project and other projects in the area
Extent	Regional (4)	Regional (4)
Duration	Long-term (4)	Long term (4)
Magnitude	Low moderate (5)	Moderate to High (7)
Probability	Highly Probable (5)	Highly Probable (5)
Significance	High (65)	High (80)
Status (positive or negative)	Positive	Positive
Reversibility	Yes	Yes
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	Yes	

Mitigation:

Mitigation can only be implemented at a regional level and will need to be driven on a provincial and municipal basis. In this sense, the following mitigation measures would need to be considered.

- » Implement a training and skills development programme for locals.
- » Ensure that the procurement policy supports local enterprises.
- » Establish a social responsibility programme in line with the REIPPP.
- » Work closely with the appropriate municipal structures in regard to establishing a social responsibility programme.
- » Ensure that any trusts or funds are strictly managed in respect of outcomes and funds allocated.

7.8 Conclusion regarding Cumulative Impacts

The assessment of the cumulative impacts was undertaken through the consideration of the Hyperion-Kalbas 132kV power line in isolation and compared to the cumulative impacts of the proposed grid connection and other grid connection developments surrounding the assessed corridor. Cumulative impacts are expected to occur with the development of the grid connection infrastructure throughout all phases of the project life cycle and within all areas of study considered as part of this BA Report. The main aim for the assessment of cumulative impacts considering the Hyperion-Kalbas 132kV power line is to determine whether the cumulative impact will be acceptable within the landscape proposed for the development, and whether the cumulative loss, from an environmental and social perspective, will be acceptable without whole-scale change.

The significance of the cumulative impacts associated with the development of the Hyperion-Kalbas 132kV power line are predominately low to medium, depending on the impacts being considered, although potential high impacts in terms of alteration of the sense of place have been identified.

A summary of the cumulative impacts is included in **Table 7.3** below.

Table 7.3: Summary of the cumulative impact significance for the Hyperion-Kalbas 132kV power line within the development area

Specialist assessment	Overall significance of impact of the proposed project considered in isolation	Cumulative significance of impact of the project and other projects in the area
Ecology	Low	Medium
Avifauna	Low	Medium
Heritage (archaeology and palaeontology)	Low	Medium
Visual	Low	Medium
Social	Medium (positive impacts) Low (negative impacts)	Medium to High (positive impacts) Medium to High (negative impacts)

The following can be summarised and concluded regarding the cumulative impacts for the Hyperion-Kalbas 132kV power line:

- » **Ecological processes:** The development of the proposed Hyperion-Kalbas 132kV power line will result in the small and localised loss of habitat along the proposed route; however, this habitat loss will lead to the displacement of faunal species. Although this displacement is not expected to be significant, it will be occurring within a region that has, and still is, experiencing larger scale species displacement due to surrounding developments. Cumulative impacts are expected to be of medium significance.
- » **Avifauna:** Although there are several existing powerline in the surrounding area and the broader study area is in a fair to good ecological state, the loss of habitat from the proposed activities will be limited, and it is unlikely that the proposed development of the Hyperion-Kalbas 132kV power line will cause any significant impacts on avifaunal species of concern, provided mitigation measures are implemented. Cumulative impacts are expected to be of medium significance.
- » **Heritage (including archaeology and palaeontology):** Due to the limited heritage resources identified within the assessed corridor, the development of the Hyperion-Kalbas power line is not expected to result in the unacceptable loss of heritage resources. In general, the development of the power line is considered acceptable from a heritage perspective subject to the recommended mitigation measures.
- » **Visual:** The development of the Hyperion-Kalbas power line is proposed within an area where grid infrastructure and other industrial infrastructure have already been developed. As a result of the existing impacts and the small area of visual exposure associated with the power line, there will be no unacceptable impact on the visual quality of the landscape associated with the development of the power line and other grid connection infrastructure within the surrounding area.
- » **Social:** Potential cumulative impacts identified for the project include positive impacts on the economy, business development, and employment, as well as negative impacts such as an influx of jobseekers (associated with risk of HIV, increased crime, and disruption of services and supplies) and change in the area's sense of place. The significance of the impacts will be medium to high for positive impacts and medium to high for negative impacts. No fatal flaws associated with the cumulative impacts are evident at a social level. Cumulative impacts associated with the development are therefore considered acceptable.

Based on the specialist cumulative assessments and findings, the development of the Hyperion-Kalbas 132kV power line, it can be concluded that the project cumulative impacts will be of a low to medium significance, apart from those associated with some social impacts which may be high. There are no impacts or risks

identified to be considered as unacceptable. In addition, no impacts which will result in whole-scale change are expected with the proposed development.

CHAPTER 8: CONCLUSIONS AND RECOMMENDATIONS

Hyperion Solar Hybrid (Pty) Ltd proposes the construction and operation of a 132kV power line to connect the Hyperion Hybrid Facility, located near Kathu in the Northern Cape Province, to the Eskom National Grid at the Kalbas Substation. The project will include the development of a single/double circuit power line and associated servitude. The Hyperion-Kalbas 132kV power line is considered as essential infrastructure to the proposed Hyperion Hybrid Facility.

A corridor of 300m and 8km long was assessed within this BA process to allow for the optimisation of the grid connection infrastructure layout and to accommodate environmental sensitivities. The proposed Hyperion-Kalbas 132kV power line will be developed within this assessed grid connection corridor.

The full length of the assessed 300m corridor traverses 3 affected properties, namely:

- » Remainder of the Farm Lyndoch 432
- » Portion 1 of the Farm Selsden 464
- » Remainder of the Farm Kathu 465

A summary of the recommendations and conclusions for the proposed development as determined through the BA process is provided in this Chapter.

8.1. Legal Requirements as per the EIA Regulations, 2014 (as amended), for the undertaking of a Basic Assessment Report

This chapter of the BA Report includes the following information required in terms of Appendix 1: Content of the BA Report:

Requirement	Relevant Section
3(k) where applicable, a summary of the findings and impact management measures identified in any specialist report complying with Appendix 6 to these Regulations and an indication as to how these findings and recommendations have been included in the final report	A summary of the findings of the specialist studies undertaken for Hyperion-Kalbas 132kV power line has been included in section 8.2.
3(l) an environmental impact statement which contains (i) a summary of the key findings of the environmental impact assessment, (ii) a map at an appropriate scale which superimposes the proposed activity and its associated structures and infrastructure on the environmental sensitivities of the preferred site indicating any areas that should be avoided, including buffers and (iii) a summary of the positive and negative impacts and risks of the proposed activity and identified alternatives.	An environmental impact statement containing the key findings of the environmental impacts of Hyperion-Kalbas 132kV power line has been included as section 8.4. Sensitive environmental features located within the Hyperion-Kalbas 132kV power line study area and development area, overlain with the proposed development footprint have been identified and are shown in Figure 8.1. A summary of the positive and negative impacts associated with Hyperion-Kalbas 132kV power line has been included in section 8.2.
h (xi) a concluding statement indicating the preferred alternatives, including preferred location of the activity.	A concluding statement indicating the preferred alternatives and the preferred location of the activity is included in section 8.4 and 8.5.
3(n) any aspects which were conditional to the findings of the assessment either by the EAP or specialist which are to be included as conditions of authorisation.	All conditions required to be included in the Environmental Authorisation of the Hyperion-Kalbas 132kV power line have been included in section 8.5.
3(p) a reasoned opinion as to whether the proposed activity should or should not be authorised, and if the opinion is that it should be authorised, any conditions that should be made in respect of that authorisation.	A reasoned opinion as to whether the Hyperion-Kalbas 132kV power line should be authorised has been included in section 8.5.

8.2. Evaluation of the Hyperion-Kalbas 132kV power line

The preceding chapters of this BA Report together with the specialist studies contained within **Appendices D-J** provide a detailed assessment of the potential impacts that may result from the development of the Hyperion-Kalbas 132kV power line. This chapter concludes the environmental assessment of the grid connection corridor by providing a summary of the results and conclusions of the assessment. In doing so, it draws on the information gathered as part of the BA process, the knowledge gained by the environmental specialists and the Environmental Assessment Practitioner (EAP) and presents a combined and informed opinion of the environmental impacts associated with the development.

No environmental fatal flaws were identified in the detailed specialist studies conducted, and no impacts of unacceptable or high significance are expected to occur with the implementation of the recommended mitigation measures. These measures include, amongst others, the avoidance of sensitive features such as pans/wetlands, and the installation of anti-collision bird devices within certain sections of higher sensitivity.

Impacts identified to be associated with the proposed project and assessed within this report include:

- » Impacts on ecology (including flora, fauna).
- » Impacts on aquatic resources.

- » Impacts on avifauna.
- » Impacts on soil and agricultural potential.
- » Impacts on heritage resources, including archaeology and palaeontology.
- » Visual impacts on the landscape as a result of the power line infrastructure
- » Impacts on the social environment.

8.2.1 Impacts on Ecology

The impacts of the proposed Hyperion-Kalbas 132kV power line on the floral and faunal habitat, diversity and species of concern (SCC) are considered to range from medium-low to low significance impacts prior to the implementation of mitigation measures. With mitigation fully implemented all impacts can be reduced to low and very low significance impacts. No significant impacts on the biodiversity associated with the focus area are anticipated for the proposed development (**Appendix D**). Considering the findings of the study and potential for mitigation, it is the reasoned opinion of the specialist that the Hyperion-Kalbas 132kV power line can be authorised from an ecological perspective.

8.2.2 Impacts on Avifauna

The major impact anticipated to occur as a result of the Hyperion-Kalbas 132kV power line are collisions and electrocutions during the operation of the power line. It is anticipated that, should the proposed mitigation measures be implemented, the risk of collisions and electrocutions can be drastically reduced. Although several SCC are known to inhabit the area, no known nesting or roosting sites were observed in the focus area and impacts to the priority species are not anticipated to be significant. From an avifaunal ecological perspective, the proposed development can be considered favourable (**Appendix E**). Considering the findings of the study and potential for mitigation, it is the reasoned opinion of the specialist that the Hyperion-Kalbas 132kV power line can be authorised from an avifaunal perspective.

8.2.3 Impacts on Aquatic Resources

The proposed Hyperion-Kalbas 132kV power line was determined to pose a Low impact significance to the cryptic wetlands identified within the study area. Due to these infrastructure components located outside of the delineated boundary of the cryptic wetlands and 32m NEMA Zone of Regulation (ZoR), no direct impacts from the construction of the power line and related infrastructure are expected to occur. Nevertheless, the potential occurrence of impacts associated with edge effects on the watercourses must be considered. If these edge effects are managed accordingly the impact significance on the wetlands is expected to remain low (**Appendix G**). Considering the findings of the study and potential for mitigation, it is the reasoned opinion of the specialist that the Hyperion-Kalbas 132kV power line can be authorised from an aquatic resources perspective.

8.2.4 Impacts on Soil and Agricultural Potential

The Soils & Agricultural Compliance Statement (**Appendix H** of the BA Report) identified the soils in the project area to be of low agricultural potential, and that most of the impacts are anticipated to occur during the construction phase of the proposed development. Impacts identified from a soil, agricultural and land potential include a reduction of land with natural vegetation for livestock grazing and susceptibility to soil erosion. The anticipated impact is associated with a short-term duration, given the short duration of the construction phase (i.e. 10-12 months), and are associated with moderate magnitude. The anticipated

impacts are associated with a low significance following the implementation of the recommended mitigation measures. Considering the findings of the study and potential for mitigation, it is the reasoned opinion of the specialist that the Hyperion-Kalbas 132kV power line can be authorised from a soil, agricultural and land potential perspective.

8.2.5 Impacts on Heritage (including archaeology and palaeontology)

It is expected that impacts to heritage and palaeontological resources will occur during the construction phase due to the potential to intersect archaeological resources during excavation of the pylon foundations. However, with appropriate mitigation, the impacts can be easily managed, and a scientific benefit could even be derived with successful description and rescue of heritage materials. No impacts are expected during the operation phase of the project.

The impacts of the proposed development on archaeological and palaeontological resources is therefore of low to moderate significance, with a long-term duration and a low magnitude following the implementation of the recommended mitigation measures. Therefore, the development of the Hyperion-Kalbas 132kV power line will not have a significant negative impact on the archaeological and palaeontological resources identified within the grid connection corridor. As such, the development of the power line is not associated with any fatal flaws from a heritage, archaeological and palaeontological perspective, and it is considered to be acceptable (**Appendix F**). Considering the findings of the study and potential for mitigation, it is the reasoned opinion of the specialist that the Hyperion-Kalbas 132kV power line can be authorised from a heritage perspective.

8.2.6 Visual Impacts

The Visual Impact Assessment (**Appendix I**) identified negative impacts on visual receptors during the construction (including decommissioning) and the operation phases of the Hyperion-Kalbas 132kV power line. The impacts include an impact on the general landscape character; the visibility of the proposed power line to and a visual impact on rural homesteads; the visibility of the proposed power line to and visual impact on the T25. Due to the nature of the infrastructure and the surrounding area, impacts are expected to be limited to within 3km of the development.

The duration of the impacts in the operation phase is expected to be long-term, with a magnitude ranging from moderate to low. The significance of the impacts will be low with the implementation of mitigation measures. No impacts of a high or medium significance are expected to occur. The development of the Hyperion-Kalbas 132kV power line is therefore considered to be acceptable from a visual perspective (**Appendix I**). Considering the findings of the study and potential for mitigation, it is the reasoned opinion of the specialist that the Hyperion-Kalbas 132kV power line can be authorised from a visual perspective.

8.2.7 Social Impacts

The Social Impact Assessment (**Appendix J**) identified that the majority of the negative and positive social impacts associated with the project are anticipated to occur during the construction phase. The anticipated duration for the construction phase of the project is approximately 10-12 months, following which the power line will be handed over to Eskom for the duration of the operation phase, which is anticipated to be 20 years. These impacts include the creation of direct and indirect employment opportunities; economic multiplier effects; an influx of jobseekers and a change in the population; safety

and security impacts; impacts on the daily living and movement patterns; nuisance impacts; and a sense of place impacts. These impacts will have a short-term duration and a small to moderate magnitude.

For the operation phase of the power line, the impacts identified include direct and indirect employment opportunities; visual impacts and a sense of place impacts; and impacts associated with the loss of agricultural land. These impacts are associated with a long-term duration and a minor to low magnitude and will be of a low significance following the implementation of the recommended enhancement measures.

The development of the Hyperion-Kalbas 132kV power line is unlikely to result in permanent damaging social impacts. From a social perspective, it is concluded that the project is acceptable subject to the implementation of the recommended mitigation and enhancement measures and management actions identified for the project. Considering the findings of the study and potential for mitigation, it is the reasoned opinion of the specialist that the Hyperion-Kalbas 132kV power line can be authorised from a social perspective.

8.2.8 Assessment of Cumulative Impacts

Cumulative impacts and benefits on various environmental and social receptors will occur to varying degrees with the development of grid connection infrastructure in South Africa and within the surrounding area of the grid connection corridor. The surrounding area is associated with large scale ongoing iron ore mining operations, which have contributed to the transformation and industrialisation of the landscape in the area. The grid connection corridor for the Hyperion-Kalbas 132kV power line is located within an area where several grid connection developments are proposed and existing. Existing grid connection infrastructure within the vicinity of the grid connection corridor for the Hyperion-Kalbas 132kV power line include the Ferrum/Umtu 1 400kV, Ferrum/Umtu 1 132kV, Ferrum/Fox 1 132kV, Ferrum/Asbes 1 666kV, Ferrum/Nieuwehoop 1 400kV, Mookodi/Ferrum 1 400kV, Olien/Ferrum 1 275kV, and Kathu CSP power lines.

Based on the specialist cumulative assessments and findings regarding the development of the Hyperion-Kalbas 132kV power line (refer to **Chapter 7** and specialist reports contained within **Appendix D - J**) and its contribution to the overall impact within the surrounding area, it can be concluded that there are no cumulative impacts or risks identified as unacceptable with the development of the Hyperion-Kalbas 132kV power line and other grid connection infrastructure within the surrounding area. In addition, no impacts that will result in whole-scale change are expected as a result of the Hyperion-Kalbas 132kV power line. Considering all aspects, cumulative impacts associated with the Hyperion-Kalbas 132kV power line have been assessed to be acceptable, with no unacceptable loss or risk expected.

8.3. Environmental Sensitivity Mapping

As part of the specialist investigations undertaken within the grid connection corridor of the Hyperion-Kalbas 132kV power line, specific environmental features and areas were identified which will be impacted by the placement of the power line infrastructure. The current condition of the features identified (i.e. intact or disturbed) informed the sensitivity of the environmental features and the capacity for disturbance and change associated with the proposed development. The environmental sensitive features and areas identified within the grid connection corridor are illustrated in Figure 8.1. The sensitive features identified specifically relate to ecological, freshwater resources, avifauna and heritage resources, and are detailed below:

- » Although no wetland features are within the power line corridor, several cryptic wetlands are in the surrounding area within 500m from the power line corridor.
- » The floral features in the power line corridor are associated with an intermediate ecological sensitivity due to the presence of two protected trees, namely *Vachellia erioloba* and *V. haematoxylon*,

8.4. Environmental Costs Benefits of the Power Line

Environmental costs (including those to the natural environment, economic and social environment) can be anticipated at a local and site-specific level and are considered acceptable provided the mitigation measures, as outlined in the BA Report and the EMPr, are implemented and adhered to. No fatal flaws have been identified. These environmental costs could include:

- » A loss of biodiversity, flora and fauna due to the clearing of land for the construction and utilisation of land for the power line - The cost of loss of biodiversity is considered to be limited due to the small footprint associated with the power line infrastructure (i.e. tower footprint and associated access roads) and the placement of the grid connection corridor within vegetation and features considered of a low and medium sensitivity.
- » Loss of avifauna habitat and loss of avifauna – The cost of the loss of habitat and the loss of avifauna species is not considered to be significant as the majority of the avifauna of the affected and surrounding environment appears fairly similar to that found across the bioregion. There is an absence of communal or solitary roosting and nesting sites for red-listed species within the grid connection corridor.
- » Visual impacts associated with the power line - The development of the power line may have a visual impact on residents and travellers along the T25 secondary road in the area. However, the proposed power line infrastructure will be viewed in the context of existing grid connection infrastructure in the area (i.e. the existing Kalbas substation, Fox/Umtu 1 132kV etc.) and will be limited to areas within 3km of the development.
- » Loss of land available for agricultural activities within the grid connection corridor. The environmental cost is anticipated to be very limited due to the fact that the power line infrastructure is associated with a small footprint; the grid connection corridor does not traverse areas of a high agricultural sensitivity and the area within the vicinity of the corridor has been extensively transformed due to the presence electricity generation facilities.

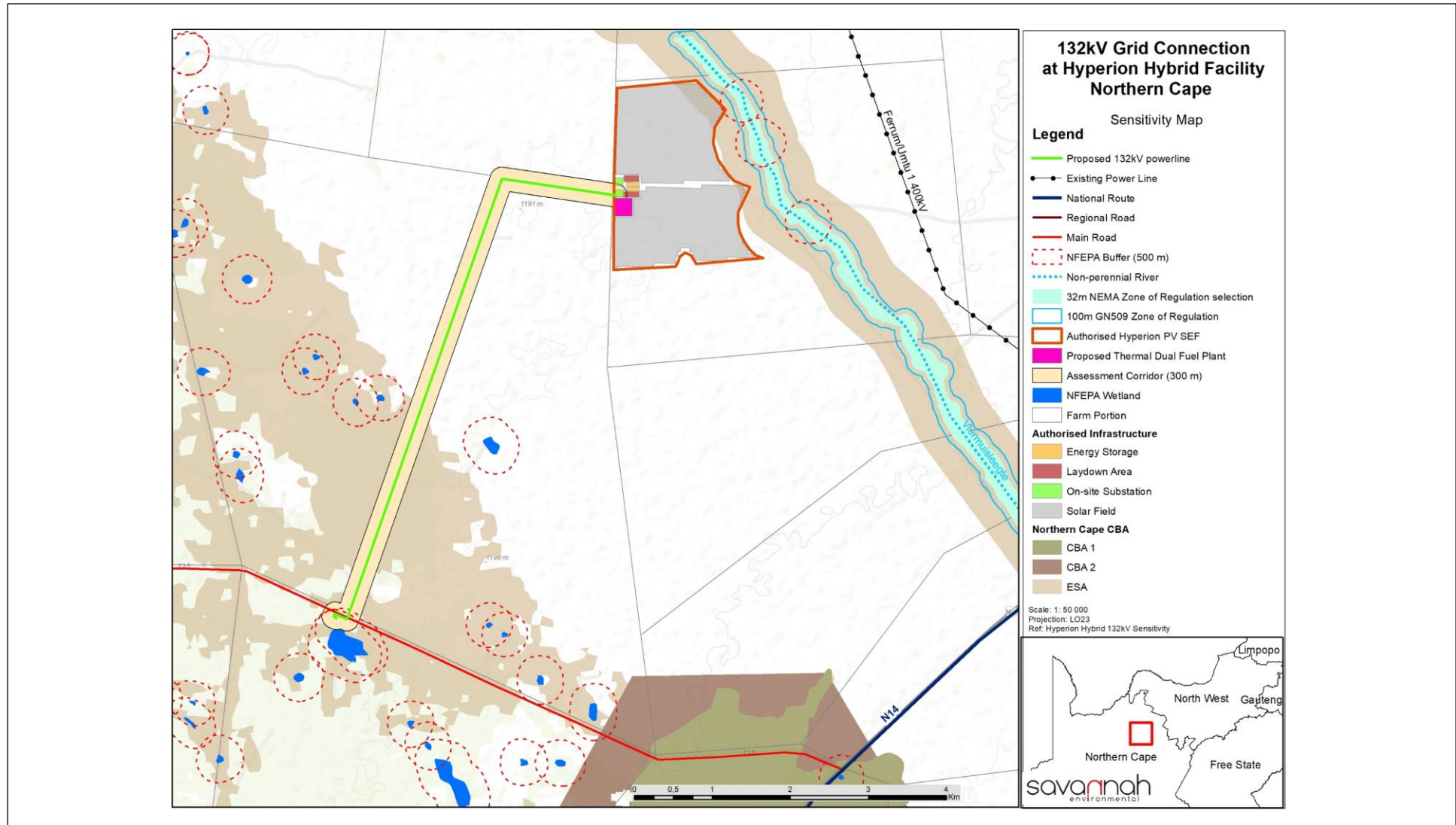


Figure 8.1: Environmental sensitivity and layout map of Hyperion-Kalbas 132kV power line development footprint (A3 map is included in Appendix B).

Benefits of the Hyperion-Kalbas 132kV power line include the following:

- » The project will facilitate the connection of the Hyperion Hybrid Facility to the national grid, allowing for the distribution of 200MW of electricity.
- » The project contributes towards the Provincial and Local IDP objectives for the provision of electricity.
- » The project will result in a number of social benefits to the region, including job creation and economic upliftment.

The benefits of the Hyperion-Kalbas 132kV power line are expected to occur at a national, regional and local level. As the costs to the environment at a site-specific level have been largely limited through the appropriate placement of the grid connection corridor within areas considered to be acceptable for the development power line, the benefits of the project are expected to outweigh the environmental costs of the development.

8.4. Overall Conclusion (Impact Statement)

The construction and operation of a 132kV power Line with a servitude of 32m, and associated access roads within an 8km long and 300m wide grid connection corridor near the town of Kathu in the Gamagara Local Municipality and the John Taolo Gaetsewe District Municipality has been proposed by Hyperion Solar Hybrid (Pty) Ltd. A technically feasible grid connection corridor has been proposed by the proponent and assessed as part of the BA process. The assessment of the grid connection corridor was undertaken by independent specialists and their findings have informed the results of this BA Report.

The specialist findings have indicated that there are no environmental fatal flaws associated with the development of the Hyperion-Kalbas 132kV power line within the identified corridor. The grid connection corridor assessed through this BA process is considered as the most appropriate and preferred for the development of the power line and associated infrastructure and is considered to be acceptable within all fields of specialist study undertaken for the project. All impacts associated with the preferred grid connection corridor can be mitigated to acceptable levels or enhanced through the implementation of the recommended mitigation or enhancement measures.

8.5. Overall Recommendation

Considering the findings of the independent specialist studies, the impacts identified, the grid connection corridor proposed by the proponent, as well as the potential to further minimise the impacts to acceptable levels through mitigation, it is the reasoned opinion of the Environmental Assessment Practitioner (EAP) that the development of the Hyperion-Kalbas 132kV power line is acceptable within the landscape and can reasonably be authorised. The following infrastructure should be included within the authorisation issued for the project:

- » A single- or double-circuit 132kV overhead power line; and
- » Associated infrastructure:
 - Laydown areas.
 - Servitude road.

The following key conditions would be required to be included within the environmental authorisation issued for the Hyperion-Kalbas 132kV power line:

- » The 32m power line servitude should be located within the assessed corridor which traverses Remainder of the Farm Lyndoch 432, Portion 1 of the Farm Selsden 464 and Remainder of the Farm Kathu 465. The project footprint must remain within the assessed grid connection corridor.
- » Should the route of the proposed power line be required to move/shift from the centre line within the 300 m corridor, it is recommended that the route be shifted eastwards where the impact to the cryptic wetlands would be lower compared to moving westwards where there are many more cryptic wetlands and a risk of infringing on the property of a different landowner.
- » As far as possible, existing access roads must be used.
- » All mitigation measures detailed within this BA Report, as well as the specialist reports contained within **Appendices D to J**, are to be implemented.
- » The EMPr as contained within **Appendix K** of this BA Report should form part of the contract with the Contractor appointed to construct and the maintain the Hyperion-Kalbas 132kV power line in order to ensure compliance with environmental specifications and management measures. The implementation of this EMPr for all life cycle phases of the Hyperion-Kalbas 132kV power line is considered key in achieving the appropriate environmental management standards as detailed for this project.
- » Following the final design of the Hyperion-Kalbas 132kV power line, a final layout/route should illustrate the position of each of the pylon/tower positions which must be submitted to the DEFF for review and approval prior to commencing with construction activities.
- » A pre-construction walk-through of the final power line route within the grid connection corridor for species of conservation concern that would be affected and that can be translocated must be undertaken by an ecologist prior to the commencement of the construction phase. Permits from the relevant national and provincial authorities, i.e. the Northern Cape Department of Agriculture, Environmental Affairs, Rural Development and Land Reform (DAEARD&LR) and the Department of Environment, Forestry and Fisheries (DEFF), must be obtained before the individuals are disturbed.
- » The necessary water use authorisation must be obtained from the Department of Human Settlements, Water and Sanitation (DHSWS) for impacts to a watercourse (i.e. where infrastructure is within 500m of a wetland, in this case) prior to construction.
- » A comprehensive rehabilitation plan must be developed and implemented from the project onset within watercourse areas to ensure a net benefit to the aquatic environment.
- » A Traffic Management Plan must be developed and implemented for the project in order to minimise impacts on surrounding landowners.

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