POORTJIE WES CLUSTER GRID

Western Cape Province

Basic Assessment Report

June 2022

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PROJECT DETAILS

Title	:	Basic Assessment Report for the Poortjie Wes Cluster Grid, Western Cape Province.
Authors	:	Savannah Environmental (Pty) Ltd Tamryn Lee Goddard Jo-Anne Thomas
Client	:	Poortjie Wes Cluster Grid (Pty) Ltd
Report Revision	:	Report for 30-day public review period
Date	:	June 2022

When used as a reference this report should be cited as: Savannah Environmental (2022) Basic Assessment Report for the Poortjie Wes Cluster Grid, Western Cape Province

PURPOSE OF THE BASIC ASSESSMENT REPORT AND INVITATION TO COMMENT

Poortjie Wes Cluster Grid is proposing the development of grid connection infrastructure on a site located approximately 15km north-west of Nelspoort and 60km south-west of Beaufort West within the Central Karoo District Municipality in the Western Cape Province. The development of the grid connection infrastructure is required to enable the connection of the Poortjies Wes Cluster of Renewable Energy Facilities, which comprises six (6) Solar PV Energy Facilities, to the national grid for the evacuation of the generated electricity. The entire extent of the site proposed for the grid connection infrastructure falls within the Central Corridor of the Strategic Transmission Corridors[1]. The grid connection infrastructure is known as the Poortjie Wes Cluster Grid. 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 BA Report describes and assesses this proposed project and consists of the following chapters:

- **Chapter 1** provides background to the Poortjie Wes Cluster Grid and the basic assessment process.
- **Chapter 2** provides a description of the Poortjie Wes Cluster Grid, the site selection information and the identified project alternatives.
- **Chapter 3** outlines the strategic regulatory and legal context for energy planning in South Africa and specifically for the proposed Poortjie Wes Cluster Grid.
- **Chapter 4** describes the need and desirability of the Poortjie Wes Cluster Grid within the identified project site.
- **Chapter 5** outlines the approach to undertaking the basic assessment process.
- **Chapter 6** describes the existing biophysical and socio-economic environment within and surrounding the project site.
- **Chapter 7** provides an assessment of the potential issues and impacts associated with the Poortjie Wes Cluster Grid and presents recommendations for the mitigation of significant impacts.
- **Chapter 8** provides as assessment of the potential cumulative impacts.
- **Chapter 9** presents the conclusions and recommendations based on the findings of the BA Report.
- **Chapter 10** provides references used in the compilation of the BA Report.

Basic Assessment Reports in support of the Application for Environmental Authorisation for each project have been compiled and are available for review and comment from **Friday, 03 June 2022** to **Thursday, 07 July 2022**. The availability of the BA Report for the grid connection infrastructure for a 30-day review and comment period will be from **Wednesday, 08 June 2022** to **Thursday, 14 July 2022**. The reports are available at the Savannah Environmental online stakeholder engagement platform at (https://savannahsa.com/public-documents/energy-generation/. Reports for Brakpan 2 Solar Energy Facility and Belvedere Solar Energy facility will be available at a later date.

Please submit your comments by the **07 July 2022** or the **14 July 2022** to:

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Tel: 011-656-3237
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[1] The Strategic Transmission Corridors are identified by the Department of Forestry, Fisheries, and the Environment (DFFE)) as geographical areas of strategic importance for the development of the supporting large scale electricity transmission and distribution infrastructure in terms of Strategic Integrated Project 10: Electricity Transmission and distribution. This is as per GNR113 of February 2018 and GNR383 of April 2021.

EXECUTIVE SUMMARY

Poortjie Wes Cluster Grid (Pty) Ltd is proposing the development of grid connection infrastructure on a site located approximately 15km north-west of Nelspoort and 60km south-west of Beaufort West within the Beaufort West Local Municipality and the Central Karoo District in Western Cape Province. The development of the grid connection infrastructure is required to enable the connection of the Poortjies Wes Cluster of Renewable Energy Facilities, which comprises six (6) Solar PV Energy Facilities, to the national grid for the evacuation of the generated electricity. The entire extent of the site proposed for the grid connection infrastructure falls within the Central Corridor of the Strategic Transmission Corridors[2]. The grid connection infrastructure is known as the Poortjie Wes Cluster Grid.

The projects which the proposed grid connection infrastructure will facilitate connection for are known as:

- Belvedere Solar Energy facility;
- Brakpan 1 Solar Energy facility;
- Brakpan 2 Solar Energy facility;
- Montana 1 Solar Energy facility;
- Montana 2 Solar Energy facility; and
- Montana 3 Solar Energy facility.

The above listed renewable energy facilities are located within the Beaufort West REDZ (REDZ 11), as well as within the Central Strategic Transmission Corridor. Each project proposed as part of this cluster is the subject of a separate EIA application process.

Each of the six renewable energy facilities listed above will be connected to the proposed 132kV Belvedere Collector Switching Station (the "Collector Switching Station") via 132kV Overhead Lines ("OHLs") from each solar facility. The individual project 132kV power lines are assessed as part of the separate Basic Assessment processes. The scope of this Basic Assessment (BA) Report is solely focused on the following infrastructure:

- A 132kV Belvedere Collector Switching Station (the "Collector Switching Station") and 132kV Overhead Lines ("OHLs") from each solar facility. The Collector Switching Station will have a footprint of ~16ha in extent and will be located on the Farm Belvedere Nr. 73, in the Beaufort West Local Municipality, Division of Murraysburg, Western Cape Province.
- The proposed Collector Switching Station will connect to the new Poortjie Wes 400/132kV LILO MTS ("Poortjie Wes LILO MTS") via a 132kV OHL (approximately 7km in length). This OHL will cross the 400kV Droërivier/Hydra OHL. A corridor of 300m is being considered in this BA process, within which the 32m servitude for this power line will be located.
- A Poortjie Wes LILO MTS, which will have a footprint of ~16ha in extent. Two alternatives[3] are being considered and will be located on Remaining Extent of Portion 2 of the Farm Belvedere Nr. 73 and the Farm Montana 73, in the Beaufort West Local Municipality, Division of Murraysburg, Western Cape Province.

[2] The Strategic Transmission Corridors are identified by the Department of Forestry, Fisheries, and the Environment (DFFE)) as geographical areas of strategic importance for the development of the supporting large scale electricity transmission and distribution infrastructure in terms of Strategic Integrated Project 10: Electricity Transmission and distribution. This is as per GNR113 of February 2018 and GNR383 of April 2021.

[3] The alternative to be implemented will be informed by environmental sensitivities and will be determined in consultation with Eskom.

» The MTS will connect to either of the existing 400kV Droërivier/Hydra OHL) traversing the property via a Loop-in Loop-out ("LILO") connection, depending on the MTS site selected. The 2 x 400kV LILO OHLs will be ~1km in length. A corridor of 500m is being considered in the BA process, within which the two 55m servitudes for these power lines will be located.

A development area of ~1 051ha has been identified within the project site by the proponent for the development of the Poortjie Wes Cluster Grid and associated infrastructure (Figure 1). The identification of this development area considered technical and environmental constraints in the larger property in line with a typical mitigation hierarchy. The development area has been fully considered within this BA process and assessed in terms of its suitability from an environmental and social perspective.

No environmental fatal flaws or unacceptable impacts were identified in the detailed specialist studies conducted, provided that the recommended mitigation measures are implemented. Impacts identified to be associated with the proposed project and assessed within this report include:

» Impacts on terrestrial ecology (including flora, fauna and water resources).
» Impacts on avifauna.
» Impacts on heritage resources, including archaeology and palaeontology.
» Impacts on land use, soils and agricultural potential.
» Impacts on Traffic
» Visual impacts.
» Impacts on the socio-economic environment.

Impacts on Ecology (including Flora and Fauna)

The aim of this Biodiversity Impact Assessment was to provide information to guide the risk of the proposed Poortjie Wes Grid Connection Infrastructure to the ecosystems affected by its development and their inherent fauna and flora. Based on the latest available ecologically relevant spatial data the following information is pertinent to the project area:

» It is recognised as an Ecological Support Area and an Other Natural Area as per the Western Cape Biodiversity Spatial Plan;
» The Combined Animal Species Theme Sensitivity was rated as 'Medium' to 'High' according the Environmental Screening Tool; and
» The Ecosystem Protection Level for the vegetation types associated with the development footprint is regarded as Poorly Protected.

Based on the fauna components recorded within the PAOI and proximal landscape, the area provides important ecosystem services, particularly with regards to the maintenance of dynamic soil properties and nutrient cycling. The SEI of the PAOI was determined to 'High' based on the high likelihood of occurrence for NT species, the extent of the area considered and its connectivity to natural areas within the landscape, and the low resilience of the vegetation type.

The main expected impacts of the proposed development will be the loss of habitat and emigration of fauna. Based on the outcomes of the SEI determination, the project possesses a 'High' SEI. This denotes that avoidance mitigation wherever possible must be implemented. This includes changes to project

infrastructure design to limit the amount of habitat impacted. Moreover, the avoidance and minimisation mitigation measures are the most important with respect to the mitigation hierarchy. Therefore, the infrastructure footprint must be minimised to reduce the risk of impacts to the receiving environment.

The project area is located within the Central Corridor of the Strategic Transmissions Corridors and taking into consideration that the grid infrastructure is necessary for the proposed solar energy developments and can be appropriately placed to minimise impacts on terrestrial ecology, it is the opinion of the specialist that the authorisation of the proposed project may be favourably considered. It is recommended that should any additional future developments be proposed for the remaining extent of any 'Very High' or 'High' SEI areas within the associated properties, that offset strategies be required for these authorisations.
The proposed grid connection is expected to pose a low residual risk to the delineated drainage lines, with key mitigation being the avoidance and adherence to the recommended buffer widths. Due to the low residual risk, a General Authorisation is required for the required water use authorisation.

No preference (Option A or Option B) was given to the preferred alternative in terms of ecological sensitivities.

Impacts on Avifauna

The proposed development site is well suited for the development of grid connection infrastructure such as that proposed. The available habitat across the site is already modified through grazing pressure and is located relatively close to existing overhead transmission lines, resulting in a reduced length of novel overhead powerline required for the grid connection, reducing the potential impact on species particularly susceptible to collisions with transmission lines such as bustards, cranes and storks in the area.

Martial Eagle are known to utilise multiple nesting structures within their territory, often alternating between multiple sites. This species can also forgo breeding attempts in years following a successful attempt. Therefore, a distinct possibility exists that Martial Eagle will not attempt to utilise the located nest structure during the construction phase due to factors unrelated to the proposed development. Should it become apparent that a breeding attempt is being made, however, impacts are relatively easy to mitigate through avoidance of the area during the appropriate periods (e.g. May to August/September).

The proposed development is unlikely to have a significant negative impact on the long-term viability or persistence of avifaunal species in the area and therefore can be approved from an avifaunal perspective. As such, no preference (Option A or Option B) was given to the preferred alternative in terms of avifaunal sensitivities.

Impacts on Heritage Resources

The site forms part of an intact cultural landscape representative of the Central Plateau of the Great Karoo possessing heritage value for historical, aesthetic, architectural, social and scientific reasons. The site possesses a number of landscape elements contributing to a composite cultural landscape including topographical features, open plains, water features, historic scenic routes and farmsteads. The area proposed for development is located within the Juriesfontein Murraysberg Landscape Character Area and in order to mitigate the anticipated negative impact to the historic access route, various recommendations are made.

No archaeological resources of significance were identified within the area proposed for development although the broader area has archaeological significance in terms of the sensitive dolerite outcrops in the broader area. No further mitigation is recommended.

No observations of palaeontological significance were noted within the area proposed for development. However, the geology underlying the development area remains sensitive for impacts to significant palaeontological heritage.

Based on the outcomes of the Heritage study, it is not anticipated that the proposed development of the grid connection infrastructure will negatively impact on significant heritage resources. The following recommendations are made:

- The recommendations of the VIA must be implemented.
- The Grid and other infrastructure should be concentrated to the south side of the road and should not follow both sides of the road simultaneously.
- TheGrid road crossings should be concentrated to the west side, in the broader valley area, consolidating with the existing grid road crossings
- The area proposed for development is located within the Juriesfontein Murraysberg Landscape Character Area and in order to mitigate the anticipated negative impact to the historic access route, a minimum buffer of 500m is recommended between the proposed Grid infrastructure (Option A and the associated 132kV powerline) and the road.
- The HWC Chance Fossil Finds Procedure must be implemented for the duration of construction activities
- Although all possible care has been taken to identify sites of cultural importance during the investigation of the study area, it is always possible that hidden or subsurface sites could be overlooked during the assessment. If any evidence of archaeological sites or remains (e.g. remnants of stone-made structures, indigenous ceramics, bones, stone artefacts, ostrich eggshell fragments, charcoal and ash concentrations), fossils, burials or other categories of heritage resources are found during the proposed development, work must cease in the vicinity of the find and HWC must be alerted immediately to determine an appropriate way forward.

There are limited impacts anticipated to archaeological and palaeontological heritage from this proposed development and as such, the principle of grid connection infrastructure in this location is supported from a heritage perspective as the infrastructure is located in an area able to tolerate this impact. Therefore no preference (Option A or Option B) was given to the preferred alternative in terms of heritage sensitivities.

Visual Impacts

The visual assessment of the proposed Poortjie Wes Cluster Grid Connection indicates that the construction and operation of the proposed infrastructure will have a visual effect on both the rural landscape and on sensitive receptors in the study area. The proposed infrastructure will be visible within an area that is generally characterised by low growing shrubland and wide-open undeveloped spaces. The infrastructure would thus be highly visible and impossible to hide within an area that incorporates potentially various sensitive visual receptors that may consider visual exposure to this type of infrastructure to be intrusive. The low occurrence of such sensitive visual receptors within this environment, specifically in close proximity to the proposed infrastructure as well as the presence of existing high voltage overhead power lines, is of relevance however, and has affected the significance rating of the anticipated visual impacts.

Overall, the post mitigation significance of the visual impacts is predominately **moderate** to **low.** A **high** significance rating is anticipated for users travelling along the secondary roads and residents of dwellings within 0.5 km from the proposed infrastructure. However, due to the low number/ density of homesteads/dwellings within the study area and the fact that observers travelling along the secondary road will only experience a visual intrusion for a short period of time, this impact is anticipated to be greatly reduced.

Notwithstanding the above, there are not many options as to the mitigation of the visual impact of the proposed infrastructure. No amount of vegetation screening or landscaping would be able to hide structures of these dimensions, especially within this receiving environment. General good practice measures have been recommended and should be implemented.

In order to ensure that all the spatial analyses and mapping undertaken in this report is as accurate as possible, a transparent and scientifically defensible approach in line with best practice methodology for this type of assessment, has been utilised. The objective of this process is to quantify the potential visual impacts associated with the proposed Poortjie Wes Cluster Grid Connection, using visibility analyses, proximity analyses and the identification of sensitive receptors. However, it must be noted that visual impact is a very subjective concept, personal to each individuals' backgrounds, opinions and perceptions. The subjects in this case are the identified sensitive receptors such as the residents of homesteads/dwellings and users of roads.

According to the Provincial Government of the Western Cape, Department of Environmental Affairs and Development Planning (DEA&DP) Guideline for Involving Visual and Aesthetic Specialists in the EIA Process (Oberholzer, 2005), the criteria that determine whether or not a visual impact constitutes a potential fatal flaw are categorised as follows:

1. Non-compliance with Acts, Ordinances, By-laws and adopted policies relating to visual pollution, scenic routes, special areas or proclaimed heritage sites.
2. Non-compliance with conditions of existing Records of Decision.
3. Impacts that may be evaluated to be of high significance and that are considered by the majority of the stakeholders and decision-makers to be unacceptable.

In terms of the above and to the knowledge of the author, the proposed development is compliant with all Acts, Ordinances, By-laws and adopted policies relating to visual pollution, scenic routes, special areas or proclaimed heritage sites, as well as, conditions of existing Records of Decisions and only one impact of high significance have been evaluated post mitigation though it is not deemed to be unacceptable.

This assessment has adopted a risk averse approach by assuming that the perception of most (if not all) of the sensitive visual receptors (bar the landowners of the properties earmarked for the development), would be predominantly negative towards the Poortjie Wes Cluster Grid Connection in the region. While still keeping in mind that there are also likely to be supporters of the facility (as a possible employer and income generator in the region) amongst the population of the larger region, but they are largely expected to be indifferent to the construction of the facility and not as vocal in their support for the facility as the detractors thereof.

Therefore, with the information available to the specialist at the time of writing this report, it cannot be empirically determined that the statistical majority of objecting stakeholders were exceeded. If evidence to the contrary surfaces during the progression of the development application, the specialist reserves the right to revise the statement below.

Therefore, the likelihood that the proposed development will be met with concern and objections from some of the affected sensitive receptors in the region, this report cannot categorically state that any of the above conditions were transgressed. As such these visual impacts are not considered to be fatal flaws for a development of this nature particularly due to the remote location of the study area and very low density of visual receptors. It is, therefore, suggested that the proposed Poortjie Wes Cluster Grid Connection, as per the assessed layout be supported from a visual perspective, subject to the implementation of the suggested best practice mitigation measures provided in this report.

Traffic Impacts

The potential traffic and transport related impacts for the construction and operation phases for the proposed Poortjie Wes Cluster Grid Connection were assessed:

- The traffic generated during the construction phase, although significant, will be temporary and impacts are considered to be negative and of medium significance before and of low significance after mitigation.
- During operation, it is expected that maintenance and security staff will periodically visit the facility. Substations will be unmanned. The traffic generated during this phase will be minimal and will not have an impact on the surrounding road network.
- The traffic generated during the decommissioning phase will be slightly less than the construction phase traffic and the impact on the surrounding road network will also be considered negative and of medium significance before and of low significance after mitigation.

The potential mitigation measures mentioned in the construction phase are:
- Dust suppression
- Component delivery to/ removal from the site can be staggered and trips can be scheduled to occur outside of peak traffic periods.
- The use of mobile batching plants and quarries near the site would decrease the impact on the surrounding road network by reducing the construction trips and the distance travelled to transport the materials to the site.
- Staff and general trips should occur outside of peak traffic periods.
- A "dry run" of the preferred route.
- Design and maintenance of internal roads.
- If required, any low hanging overhead lines (lower than 5.1 m) e.g. Eskom and Telkom lines, along the proposed routes will have to be moved to accommodate the abnormal load vehicles.

The construction and decommissioning phases of a development are the only significant traffic generator and therefore noise and dust pollution will be higher during this phase. The duration of this phase is very short term i.e. the impact of the traffic on the surrounding road network is temporary and a grid connection facility, when operational, does not add any significant traffic to the road network.

Both the proposed access points and the access roads to the sites/facilities are deemed feasible from a traffic engineering perspective, however, vertical sight distances at the proposed access points should be verified on site.

The potential impacts associated with the proposed Poortjies Wes Cluster Grid Connection and associated infrastructure are acceptable from a transport perspective and it is therefore recommended that the proposed facility be authorised provided that the recommendations and mitigations contained in this report are adhered to. Therefore, Option A and Option B are considered acceptable for the development of grid infrastructure.

Socio-Economic Impacts

The energy security benefits associated with the proposed Poortjie Wes PV SEF Cluster are dependent upon it being able to connect to the national grid via the establishment of grid connection infrastructure.

The findings of the SIA indicate that the significance of the potential negative social impacts for both the construction and operational phase of the proposed grid infrastructure are **Low Negative** with mitigation. The potential negative impacts can therefore be effectively mitigated if the recommended mitigation measures are implemented. The grid infrastructure is also located within the Beaufort West REDZ and Central Transmission Corridor. The establishment of proposed grid infrastructure for the Poortjie Wes PV SEF Cluster is therefore supported by the findings of the SIA.

The owner of Belvedere 73/1 indicated that Option A was the preferred transmission line alignment given that it is located along the Nelspoort-Murraysburg Road corridor. Option B located to the north of the road was not regarded as suitable as it would impact on a portion of the property that is used for seasonal commercial hunting. Potential impacts are related to sense of place/ visual, potential safety restrictions. This would compromise the best hunting area on the property also compromise the camp infrastructure that has been established for commercial hunting in the area. This is pertinent, as another portion of the property would be sterilized to hunting, should the proposed Montana PV 3 facility be constructed (Vivier, pers. comm). Therefore, option A transmission line alignment located parallel to the Nelspoort-Murraysburg Road is the preferred option.

Assessment of Cumulative Impacts

The proposed Poortjie Wes Cluster Grid cannot be considered in isolation. Cumulative impacts from other developments in the region need to be taken into consideration. Several other renewable energy facilities, with their associated infrastructure (such as the MTS and power lines) are proposed to be built in the region.

The proposed development is located within the Central Corridor of the Strategic Transmission Corridors, which has been identified by the DFFE as an area highly suitable for electrical grid infrastructure development, given a range of factors considered. Therefore, the DFFE envisages dealing with multiple applications for transmission infrastructure and cumulative issues within Strategic Transmission Corridors. The Strategic Transmission Corridors are of strategic importance for the rollout of supporting large scale electricity transmission and distribution infrastructure in terms of Strategic Integrated Project (SIP) 10: Electricity Transmission and Distribution. The transmission corridors are considered as areas where significant negative impacts on the environment are limited and socio-economic benefits to the country are enhanced.

The proposed development will contribute to the cumulative impact experienced within the area. The cumulative impacts associated with the Poortjie Wes Cluster Grid have been assessed to be acceptable, with no acceptable loss or risk expected.

Based on the specialist cumulative assessment and findings, the proposed development and its contribution to the overall impact of similar developments and renewable energy facilities to be developed within a 30km radius, will have a Low to Medium significance. It can be concluded that the proposed development will not result in unacceptable, high cumulative impacts and will not result in whole-scale large change of the environment (refer to **Table 1** and **Chapter 8**).

Table 1: Summary of cumulative impact significance for the Poortjie Wes Cluster Grid

Specialist assessment	**Overall significance of impact of the proposed project considered in isolation (negative unless indicated otherwise) (with mitigation)**	**Cumulative significance of impact of the project and other projects in the area (negative unless indicated otherwise) (with mitigation)**
Ecology	Low	Medium
Avifauna	Medium	Medium
Heritage resource (including palaeontology)	Low	Low
Visual	Medium	Medium
Socio-economic	Low	Medium

Comparison of Alternatives

The following layout alternatives were identified by the applicant for consideration in the BA process:

Project Component	**Alternatives identified**
Collector Substation	Only one feasible site has been identified for the location of the Collector Substation. This is located on the Farm Belvedere No.73. A larger development area in the form of a 300-meter buffer are being investigated around the substation in order to allow for the avoidance of any identified environmental sensitivities.
MTS	Two alternatives have been identified for the development of the 400kV MTS. The alternative to be implemented will be informed by environmental sensitivities and will be determined in consultation with Eskom, depending on which one of the two 400kV Droërivier/-Hydra OHL power lines are identified as the preferred connection point. A larger development area in the form of 500-meter buffers are being investigated around the substations (Option A and Option B) in order to allow for the avoidance of any identified environmental sensitivities.
400kV LILO power lines	Alternative locations for the LILO power lines from the MTS are linked to the location of the MTS. A 500m development corridor is considered for the two proposed loop-in loop-out 400kV power lines to connect the MTS to the electricity grid. A servitude of 60m per line will be appropriately placed within this corridor considering technical and environmental constraints.
132kV power line	Two alternative power line corridors between the Collector Substation and the alternative MTS sites have been identified for investigation in this BA process. Each corridor is 300m wide and approximately 7km long. The power line servitude of up to 40m will be appropriately placed within this corridor considering technical and environmental constraints.

The alternative to be implemented is to be informed by environmental sensitivities and will be determined in consultation with Eskom. From the outcomes of the specialist studies, the following has been concluded:

Specialist assessment	MTS Alternative A and associated 400kV LILO corridor and 132kV power line corridor from the Collector Substation	MTS Alternative B and associated 400kV LILO corridor and 132kV power line corridor from the Collector Substation
Ecology	No preference stated	No preference stated
Avifauna	No preference stated	No preference stated
Heritage resource (including palaeontology)	No preference stated (subject to mitigation guidelines stated in section 9.2.3)	No preference stated
Visual	No preference stated	No preference stated
Socio-economic	Preferred	Acceptable

In this regard, both alternatives are considered to be acceptable. Alternative A is preferred from a socio-economic perspective. The owner of Belvedere 73/1 indicated that Option A was the preferred transmission line alignment given that it is located along the Nelspoort-Murraysburg Road corridor. Option B located to the north of the road was not regarded as suitable as it would impact on a portion of the property that is used for seasonal commercial hunting. Potential impacts are related to sense of place/ visual, potential safety restrictions. This would compromise the best hunting area on the property also compromise the camp infrastructure that has been established for commercial hunting in the area. This is pertinent, as another portion of the property would be sterilized to hunting, should the proposed Montana PV 3 facility be constructed (Vivier, pers. comm). Overall, the majority of the specialist studies concluded that either alternative could be implemented, and the technically preferred option should be selected after consultation with Eskom with the exception of the preferred Option (Option A) stated by the socio-economic specialist (refer to section 9.2.6).

Environmental Sensitivity Mapping

As part of the specialist studies undertaken within the development envelope of the 400kV MTS, and 300 m power line corridor, specific sensitive environmental features and areas were identified (refer to **Figure 1**). The sensitive features identified specifically relate to terrestrial ecology, avifauna, and heritage resources, and are detailed below:

- ***Ecology:*** Based on the latest available ecologically relevant spatial data the following information is pertinent to the project area:
  - It is recognised as an Ecological Support Area and an Other Natural Area as per the Western Cape Biodiversity Spatial Plan;
  - The Combined Animal Species Theme Sensitivity was rated as 'Medium' to 'High' according to the Environmental Screening Tool; and
  - The Ecosystem Protection Level for the vegetation types associated with the development footprint is regarded as Poorly Protected.

  Based on the fauna components recorded within the PAOI and proximal landscape, the area provides important ecosystem services, particularly with regards to the maintenance of dynamic soil properties

and nutrient cycling. The SEI of the PAOI was determined to 'High' based on the high likelihood of occurrence for NT species, the extent of the area considered and its connectivity to natural areas within the landscape, and the low resilience of the vegetation type. This denotes that avoidance mitigation wherever possible must be implemented. This includes changes to project infrastructure design to limit the amount of habitat impacted.

» ***Avifauna:*** The Avifauna Specialist concluded that the site appears to be well suited for the development of grid connection infrastructure. The available habitat across the site is already modified through grazing pressure and is located relatively close to existing overhead transmission lines, resulting in a reduced length of novel overhead powerline required for the grid connection, reducing the potential impact on species particularly susceptible to collisions with transmission lines such as bustards, cranes and storks in the area. Martial Eagle are known to utilise multiple nesting structures within their territory, often alternating between multiple sites. This species can also forgo breeding attempts in years following a successful attempt. Therefore, a distinct possibility exists that Martial Eagle will not attempt to utilise the located nest structure during the construction phase due to factors unrelated to the proposed development. Should it become apparent that a breeding attempt is being made, however, impacts are relatively easy to mitigate through avoidance of the area during the appropriate periods (e.g. May to August/September).

» ***Heritage:*** There are limited impacts anticipated to archaeological and palaeontological heritage from this proposed development and as such, the principle of grid connection infrastructure in this location is supported from a heritage perspective as the infrastructure is located in an area able to tolerate this impact. The area proposed for development is located within the Juriesfontein Murraysberg Landscape Character Area and in order to mitigate the anticipated negative impact to the historic access route, a minimum buffer of 500m is recommended between the proposed Grid infrastructure (Option A and the associated 132kV powerline) and the road.

Considering the features identified within the project site and development area, the specialists have indicated the acceptability of the proposed development. Given the degree of avoidance of the development area of High and Very High areas of ecological importance within the project site as well as avoidance of the avifauna, buffers referred to above, the development may be considered acceptable as the residual impacts are expected to be of medium significance. A final Layout of the Poortjie Wes Cluster Grid infrastructure considering environmental sensitivities is displayed in **Figure 2**.

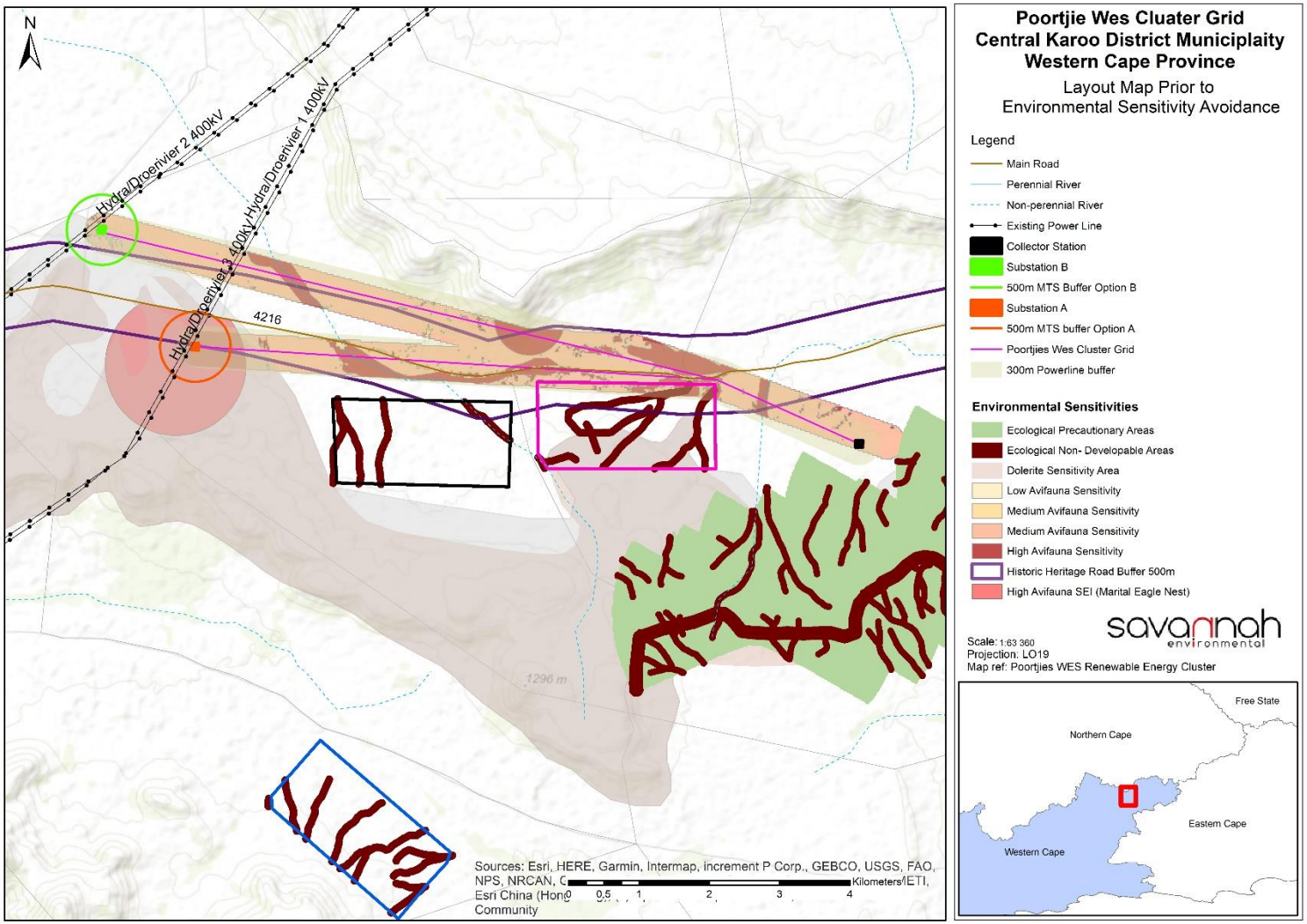

Figure 1: Overall Environmental Sensitivity Map for the Poortjie Wes Cluster Grid Study Area

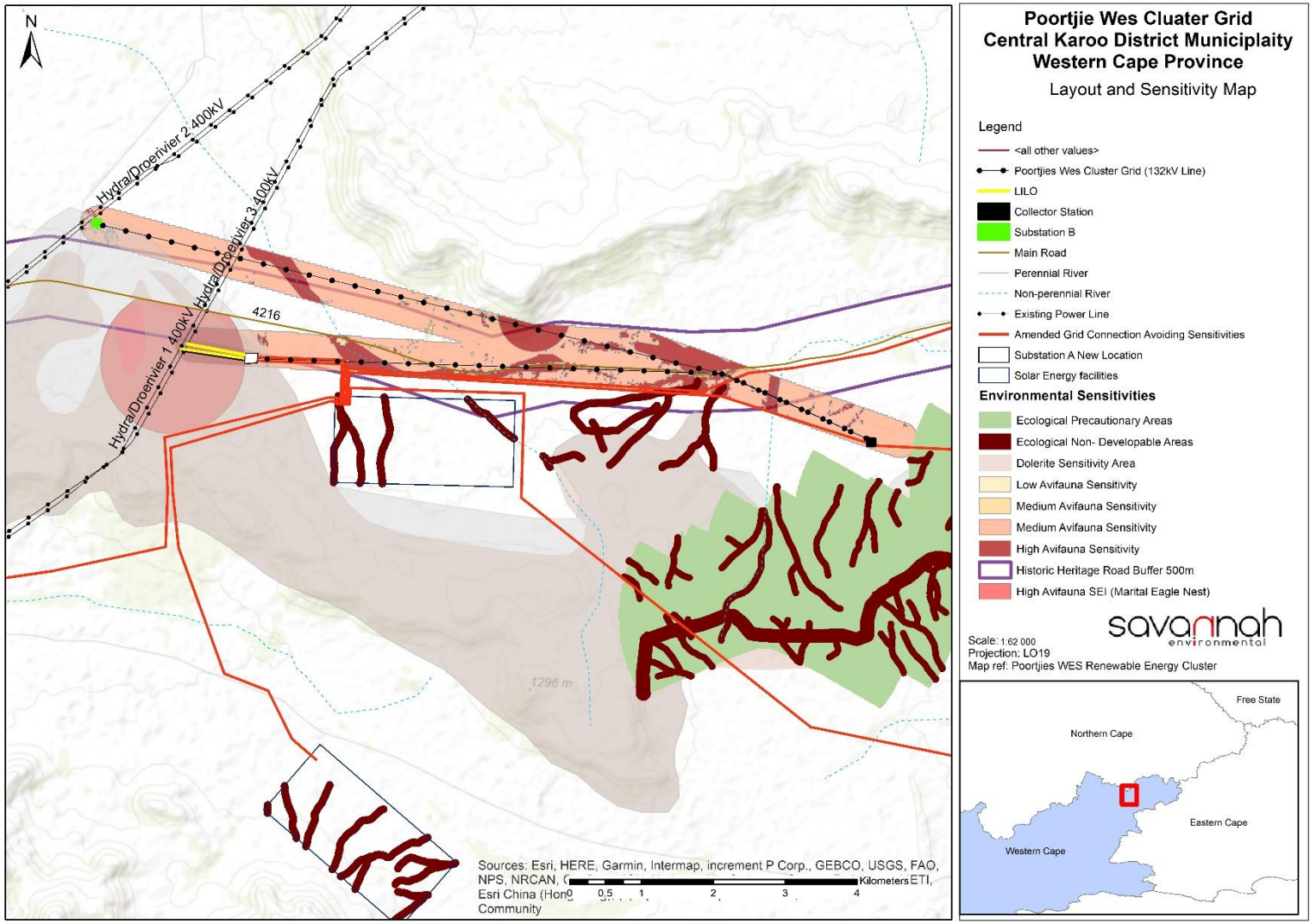

Figure 2: Final Layout map of the Poortjie Wes Cluster Grid avoiding environmental sensitivities (500m heritage road buffer)

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.

Archaeological material: Remains resulting from human activities which are in a state of disuse and are in or on land and which are older than 100 years, including artefacts, human and hominid remains and artificial features and structures.

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.

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.

Disturbing noise: A noise level that exceeds the ambient sound level measured continuously at the same measuring point by 7 dB or more.

'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 impact assessment: Environmental Impact Assessment, as defined in the NEMA EIA Regulations and in relation to an application to which scoping must be applied, means the process of collecting, organising, analysing, interpreting, and communicating information that is relevant to the consideration of that application.

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.

Perennial and non-perennial: Perennial systems contain flow or standing water for all or a large proportion of any given year, while non-perennial systems are episodic or ephemeral and thus contains flows for short periods, such as a few hours or days in the case of drainage lines.

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).

Riparian: the area of land adjacent to a stream or river that is influenced by stream-induced or related processes. Riparian areas which are saturated or flooded for prolonged periods would be considered wetlands and could be described as riparian wetlands. However, some riparian areas are not wetlands (e.g. an area where alluvium is periodically deposited by a stream during floods but which is well drained).

Site Ecological Importance (SEI): is a function of the Biodiversity Importance (BI) of the receptor (e.g., SCC, the vegetation/fauna community or habitat type present on the site) and Receptor Resilience (RR) (its resilience to impacts). An understanding of residual risk to SEI is important in determining acceptability of impact

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.

Waste: means—

a) any substance, material, or object, that is unwanted, rejected, abandoned, discarded or disposed of, or that is intended or required to be discarded or disposed of, by the holder of that substance, material or object, whether or not such substance, material or object can be re-used, recycled or recovered and includes all wastes as defined in Schedule 3 to this Act; or
b) any other substance, material or object that is not included in Schedule 3 that may be defined as a waste by the Minister

Watercourse: as per the National Water Act means -

(a) a river or spring;
(b) a natural channel in which water flows regularly or intermittently;
(c) a wetland, lake or dam into which, or from which, water flows; and
(d) any collection of water which the Minister may, by notice in the Gazette, declare to be a watercourse, and a reference to a watercourse includes, where relevant, its bed and banks

Wetlands: land which is transitional between terrestrial and aquatic systems where the water table is usually at or near the surface, or the land is periodically covered with shallow water, and which under normal circumstances supports or would support vegetation typically adapted to life in saturated soil (Water Act 36 of 1998); land where an excess of water is the dominant factor determining the nature of the soil development and the types of plants and animals living at the soil surface (Cowardin et al., 1979).

ACRONYMS

BGIS	Biodiversity Geographic Information System
CBA	Critical Biodiversity Area
DEFF	Department of Environment, Forestry and Fisheries (National)
DWS	Department of Water and Sanitation
CBA	Critical Biodiversity Area
CR	Critically Endangered
CSIR	Council for Scientific and Industrial Research
DM	District Municipality
DMRE	Department of Mineral Resources Energy
EAP	Environmental Assessment Practitioner
EGIS	Environmental Geographic Information System
EIA	Environmental Impact Assessment
EMF	Environmental Management Framework
EMP	Environmental Management Plan
EMPr	Environmental Management Programme
EN	Endangered
EP	Equator Principles
ESA	Ecological Support Area
GA	General Authorisation
GHG	Greenhouse Gas
IBA	Important Bird Area
IDP	Integrated Development Plan
IEM	Integrated Environmental Management
IEP	Integrated Energy Plan
IFC	International Finance Corporation
IPP	Independent Power Producer
IRP	Integrated Resource Plan
IUCN	International Union for Conservation of Nature
I&AP	Interested and Affected Party
km	Kilometre
kWh	Kilowatt hour
LC	Least Concern
LM	Local Municipality
LNG	Liquid Natural Gas
m	Metre
m²	Square meters
m³	Cubic meters
m amsl	Metres Above Mean Sea Level
MW	Megawatts
NDP	National Development Plan
NEMA	National Environmental Management Act (No. 107 of 1998)
NEM: AQA	National Environmental Management: Air Quality Act (No. 39 of 2004)
NEM:BA	National Environmental Management: Biodiversity Act (No. 10 of 2004)

NEM: WA	National Environmental Management: Waste Act (No. 59 of 2008)
NFA	National Forests Act (No. 84 of 1998)
NFEPA	National Freshwater Ecosystem Priority Area
NHRA	National Heritage Resources Act (No. 25 of 1999)
NT	Near Threatened
NWA	National Water Act (No. 36 of 1998)
ONA	Other Natural Area
PA	Protected Area
RMIPPP	Risk Mitigation Independent Power Producer Procurement
SAHRA	South African Heritage Resources Agency
SAHRIS	South African Heritage Resources Information System
SAIAB	South African Institute for Aquatic Biodiversity
SANBI	South African National Biodiversity Institute
SDF	Spatial Development Framework
TOPS	Threatened or Protected Species
VU	Vulnerable

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CHAPTER 1: INTRODUCTION

Poortjie Wes Cluster Grid (Pty) Ltd is proposing the development of grid connection infrastructure on a site located approximately 15km north-west of Nelspoort and 60km south-west of Beaufort West within the Beaufort West Local Municipality and the Central Karoo District in Western Cape Province (**Figure 1.1**). The development of the grid connection infrastructure is required to enable the connection of the Poortjies Wes Cluster of Renewable Energy Facilities, which comprises six (6) Solar PV Energy Facilities, to the national grid for the evacuation of the generated electricity. The entire extent of the site proposed for the grid connection infrastructure falls within the Central Corridor of the Strategic Transmission Corridors[4]. The grid connection infrastructure is known as the Poortjie Wes Cluster Grid.

The projects which the proposed grid connection infrastructure will facilitate connection for are known as:

- Belvedere Solar Energy facility;
- Brakpan 1 Solar Energy facility;
- Brakpan 2 Solar Energy facility;
- Montana 1 Solar Energy facility;
- Montana 2 Solar Energy facility; and
- Montana 3 Solar Energy facility.

The above listed renewable energy facilities are located within the Beaufort West REDZ (REDZ 11), as well as within the Central Strategic Transmission Corridor. Each project proposed as part of this cluster is the subject of a separate EIA application process.

Each of the six renewable energy facilities listed above will be connected to the proposed 132kV Belvedere Collector Switching Station (the "Collector Switching Station") via 132kV Overhead Lines ("OHLs") from each solar facility. The individual project 132kV power lines are assessed as part of the separate Basic Assessment processes. The scope of this Basic Assessment (BA) Report is solely focused on the following infrastructure:

- A 132kV Belvedere Collector Switching Station (the "Collector Switching Station") and 132kV Overhead Lines ("OHLs") from each solar facility. The Collector Switching Station will have a footprint of ~16ha in extent and will be located on the Remaining Extent of Portion 2 of the Farm Belvedere Nr. 73, in the Beaufort West Local Municipality, Division of Murraysburg, Western Cape Province.
- The proposed Collector Switching Station will connect to the new Poortjie Wes 400/132kV LILO MTS ("Poortjie Wes LILO MTS") via a 132kV OHL (approximately 7km in length). This OHL will cross the 400kV Droërivier/Hydra OHL. A corridor of 300m is being considered in this BA process, within which the 32m servitude for this power line will be located.
- A Poortjie Wes LILO MTS, which will have a footprint of ~16ha in extent. Two alternatives[5] are being considered and will be located on Portion 1 of the Farm Montana 73, in the Beaufort West Local Municipality, Division of Murraysburg, Western Cape Province.
- The MTS will connect to either of the existing 400kV Droërivier/Hydra OHL) traversing the property via a Loop-in Loop-out ("LILO") connection, depending on the MTS site selected. The 2 x 400kV LILO OHLs will

[4] The Strategic Transmission Corridors are identified by the Department of Forestry, Fisheries, and the Environment (DFFE)) as geographical areas of strategic importance for the development of the supporting large scale electricity transmission and distribution infrastructure in terms of Strategic Integrated Project 10: Electricity Transmission and distribution. This is as per GNR113 of February 2018 and GNR383 of April 2021.

[5] The alternative to be implemented will be informed by environmental sensitivities and will be determined in consultation with Eskom.

be ~1km in length. A corridor of 500m is being considered in the BA process, within which the two 55m servitudes for these power lines will be located.

The renewable energy facilities, which the 400kV MTS and power lines will cater for, are proposed in response to identified objectives of the national and provincial government, and local and district municipalities to develop renewable energy facilities for power generation purposes. As the Poortjie Wes Cluster Grid is related to renewable energy development and the enabling of the evacuation of the power, the project will indirectly aid in the diversification and stabilisation of the country's electricity supply, in line with the objectives of the Integrated Resource Plan (IRP).

As the project has the potential to impact the environment, an Environmental Impact Assessment process is required to be completed in support of an application for Environmental Authorisation before the commencement of construction of the project. As the project falls within the Central Corridor of the Strategic Transmission Corridors and has a capacity of more than 275kV, a Basic Assessment (BA) process is applicable as per GNR113 of February 2018.

Site-specific studies and assessments will delineate areas of potential sensitivity within the proposed development footprint. Once constraining factors have been confirmed, the layout of the grid connection infrastructure can be planned to minimise social and environmental impacts. The location of the Poortjie Wes Cluster Grid is indicated in **Figure 1.1.** The location of the Poortjie Wes Cluster Grid in relation to the PoortjieWES Cluster is indicated in **Figure 1.2**.

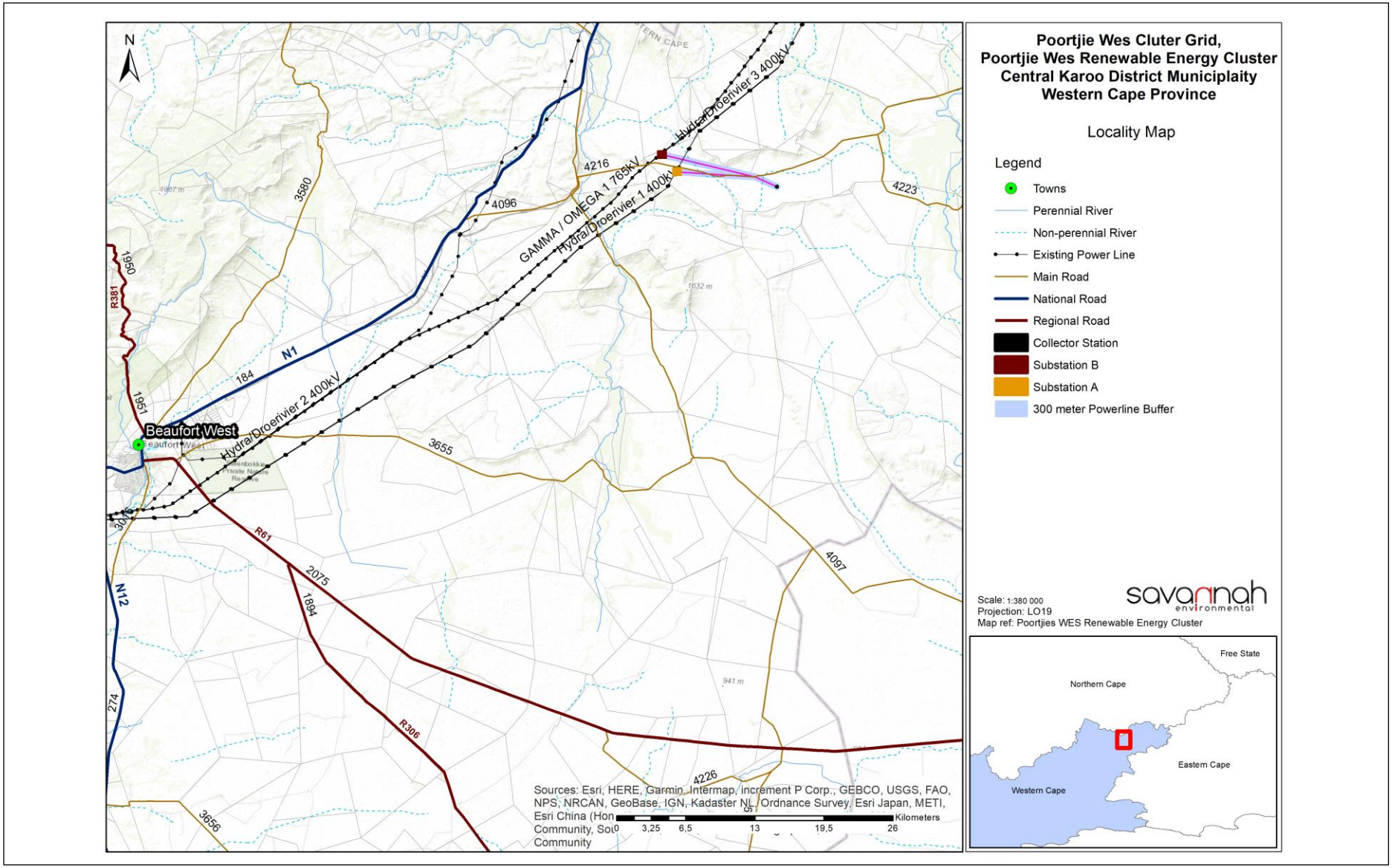


Figure 1.1: Locality map illustrating the Poortjie Wes Cluster Grid development area within the broader study area

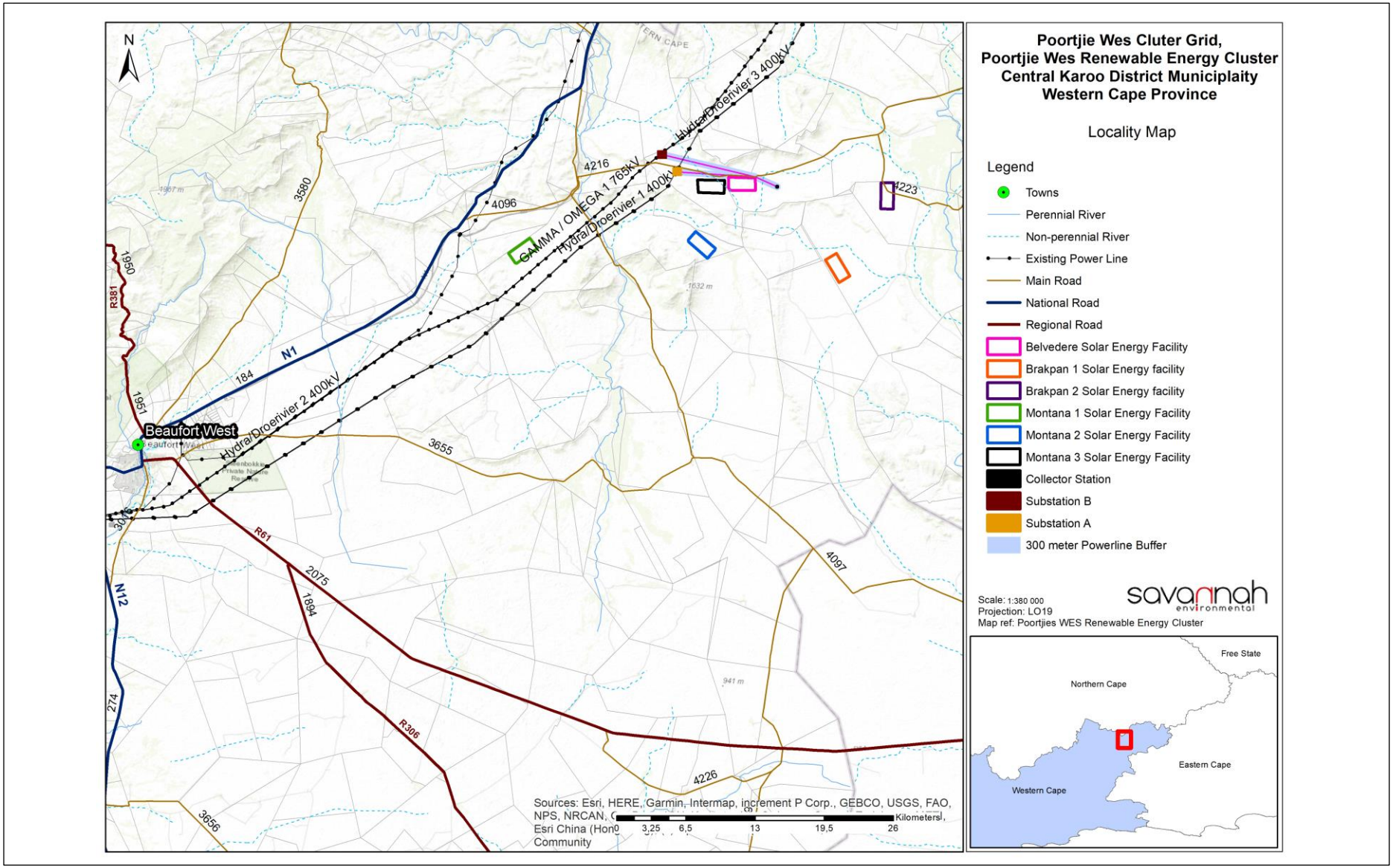


Figure 2.2: Locality map illustrating the Poortjie Wes Cluster Grid corridor in relation to the proposed Poortjies WES Cluster

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 Poortjie Wes Cluster Grid is included in Table 1.1 and Figure 1.1 and Figure 1.2. 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.

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

- **Chapter 1** provides background to Poortjie Wes Cluster Grid and the BA process.
- **Chapter 2** describes the Scope of the Poortjie Wes Cluster Grid, including identified project alternatives.
- **Chapter 3** outlines the strategic regulatory and legal context for energy planning in South Africa and specifically for Poortjie Wes Cluster Grid.
- **Chapter 4** provides a motivation for the need and desirability of the proposed project.
- **Chapter 5** outlines the approach to undertaking the BA process.
- **Chapter 6** describes the existing biophysical and social environment within and surrounding the broader study and development area.
- **Chapter 7** provides an assessment of the potential issues and impacts associated with the solar PV facility and presents recommendations for the mitigation of significant impacts.
- **Chapter 8** provides an assessment of the potential cumulative impacts.
- **Chapter 9** presents the conclusions and recommendations based on the findings of the BA Report.
- **Chapter 10** provides references used in the compilation of the BA Report.

1.2. Project Overview

A preferred project site with an extent of ~1073ha has been identified by Poortjie Wes Cluster Grid (Pty) Ltd as a technically suitable area for the development of the 132kV Belvedere Collector Switching Station, 132kV OHL (approximately 7km), the 400kV MTS and the 400kV power lines (LILO). The project site consists of one affected properties which make up the project site (**Figure 1.2** and **Table 1.1**):

- Portion 1 of the Farm Montana 73 in the Beaufort West Municipality, Division of Murraysburg, Western Cape Province.

A development area for the placement of the MTS (i.e., development footprint) has been identified within the project site and assessed as part of the BA process. The development area is ~1073a in extent within which the much smaller development footprint for the substations and power lines will be placed based on technical and environmental considerations. A 500m corridor has been identified within the project site for the placement of the proposed 2x 400kV LILO power lines. The corridor is assessed as part of this BA process (**Figure 1.2**).

The project site is suitable for the development of the 400kV MTS and power lines from a technical perspective based on the location of the site in relation to the proposed renewable energy facilities that it will cater for and considers compatibility with the current land use and land availability (refer to Chapter 2 for further details).

The table below provides an overview of the Poortjie Wes Cluster Grid. The key infrastructure components associated with the development of Poortjie Wes Cluster Grid are described in greater detail within Chapter 2 of this BA Report.

Table 1.1: Overview of the Poortjie Wes Cluster Grid development area

Province	**Western Cape Province**
District Municipality	Central Karoo District Municipality
Local Municipality	Beaufort West Local Municipality
Ward number(s)	Ward 2
Nearest town(s)	Beaufort West (58km southwest)
Affected property of the PV development area: Farm name(s), number(s), and portion numbers	Portion 1 of the Farm Montana 73
SG 21 Digit Code (s)	C05200000000007300000
Current zoning of the study area	Agricultural
Site Co-ordinates (end to end co-ordinates of powerline corridor, point co-ordinates of collector and MTS Alternatives A and B)	132kV Grid corridor: Start: 32° 6'15.20"S 23°12'30.21"EMiddle: 32° 5'28.51"S 23°10'59.77"E End 1: 32° 4'42.45"S 23° 5'21.39"E End 2: 32° 5'36.29"S 23° 6'14.55"E Collector Substation: 32° 6'8.99"S 23°12'21.67"E MTS Substation Alternative A: 32° 5'36.81"S 23° 6'20.65"E MTS Substation Alternative B: 32° 4'43.49"S 23° 5'29.38"E

1.3. Details and Expertise of the Environmental Assessment Practitioner (EAP)

In accordance with Regulation 12 of the 2014 EIA Regulations (GN R326), AGV Projects (Pty) Ltd has appointed Savannah Environmental (Pty) Ltd (Savannah Environmental) as the independent environmental consultant to undertake the Basic Assessment (BA) and prepare the BA Report (BAR) for Poortjie Wes Cluster Grid and its associated infrastructure. Neither Savannah Environmental nor any of its specialists are subsidiaries of/or are affiliated with Poortjie Wes Cluster Grid (Pty) Ltd. Furthermore, Savannah Environmental does not have any interests in secondary developments that may arise out of the authorisation of the proposed Grid connection.

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, 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:

» **Tamryn Lee Goddard** is the principal author of this report. She holds a bachelor's degree in Environmental Management, and postgraduate higher diplomas in Environmental Engineering, monitoring, and conservation ecology. She has 2 years of experience in the environmental management field. Her key focus is on undertaking environmental impact assessments, GIS mapping, public participation, and environmental management plans and programmes. She is registered as a young professional with the International Association of Impact Assessors (IAIA).

» **Jo-Anne Thomas** is the Environmental Assessment Practitioner for this project. She holds a Master of Science Degree in Botany (M.Sc. 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 EMPrs, 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, the identification of mitigation measures, and the compilation of reports in accordance with applicable environmental legislation.

» **Nondumiso Bulunga** is a Social, GIS, and Stakeholder Engagement Specialist at Savannah Environmental. Nondumiso has eight (8) years of working experience in project management and facilitation in various industries such as the environmental services field including but not limited to recycling, industrial, energy, mining, and agriculture. Working for small and large organisations, Nondumiso has gained exposure in research, collection of data, critical analysis, GIS, and environmental solutions. Nondumiso has worked on projects in South Africa and Malawi. Nondumiso is very well versed in the IFC Environmental and Social Performance Standards (including IFC PS 2012) and the associated Equator Principles, which have informed the approach and standard for projects regarding ESIA. Nondumiso is skilled at organising and

driving effective project teams at a scale relevant to the project's requirements. She has the technical experience and can quickly identify the most pertinent issues of a particular project whilst focussing on driving project success by rigorously implementing project management tools.

» **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: PROJECT DESCRIPTION AND ALTERNATIVES

This chapter provides an overview of the Poortjie Wes Cluster Grid and details the project scope, which includes the planning/design, construction, operation, and decommissioning activities required for the development, as well as a description of the preferred site location, activity, and technology alternatives, and the 'do-nothing' option for the 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 the EIA Regulations, 2014 - Appendix 1: Content of Basic Assessment Reports:

Requirement	Relevant Section
3(b) the location of the activity including (i) the 21digit 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 project is detailed in Chapter 1, **Table 1.1**, as well as section 2.2.1 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 grid development area, the power line corridor, and development footprints of the grid connection infrastructure, including associated infrastructure is included in **Figure 2.2**. The Collector Substation and MTS development areas and power line corridor have been assessed within this BA Report and the independent specialist studies.
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 project is included in **Table 2.1** and **Table 2.2**.
3(g) a motivation for the preferred site, activity, and technology alternative	The identification and motivation for the preferred project site, the development footprints within the Collector Substation and MTS development areas and power line corridors, the proposed activity and the proposed technology are included in sections 2.4.1 and 2.4.2.
3(h)(i) details of the alternative considered	The details of all alternatives considered as part of the BA process are included in sections 2.4.1 – 2.4.3.
3(h)(ix) the outcome of the site selection matrix	The site selection process followed by the developer in order to identify the preferred project site, Collector Substation, MTS development areas, power line corridor, and development footprints is described in section 2.4.1.

2.2 Nature and extent of the Poortjie Wes Cluster Grid

The development of the Collector Substation, 400kV MTS, 132kV power lines, and 400kV LILO power lines and associated infrastructure will enable the evacuation of electricity from six proposed solar facilities which will feed electricity into the National Grid. This infrastructure, therefore, serves as a grid connection solution for the development of six renewable energy facilities.

2.2.1. Project Site, MTS Development Envelope, Power Line Corridor, and Development Footprints

The preferred project site (with an extent of ~9 730ha) is located on Portion 1 of the Farm Montana No. 73. The project site is located within the Beaufort West Local Municipality and the Great Karoo District Municipality, with the entire extent of the site located within the Central Corridor of the Strategic Transmission Corridors.

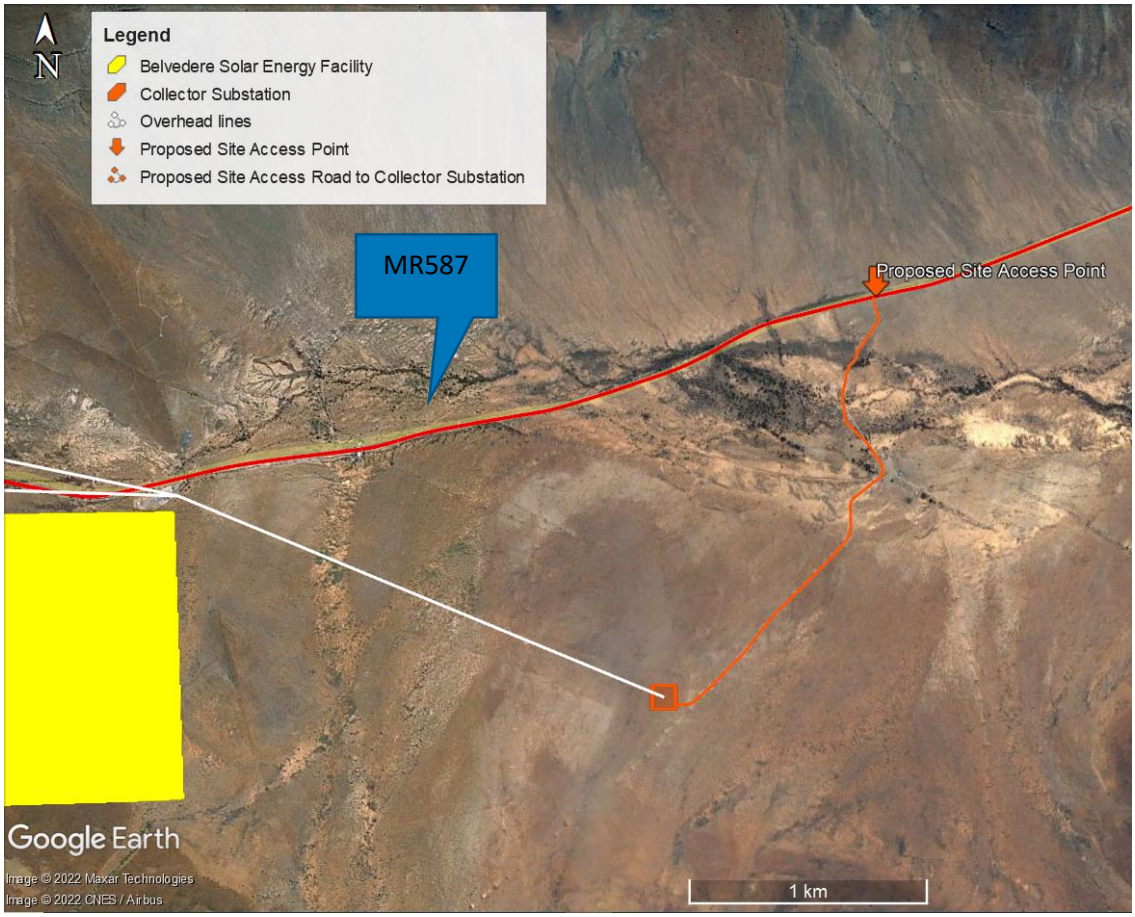
A development area for the placement of the Collector Substation and the MTS and a corridor for the placement of the power lines have been identified within the project site and assessed as part of the BA process. The development footprint proposed amounts to ~2% of the project site. The following is included:

- Two alternative sites for the MTS have been identified, each ~16ha in extent. The permanent development footprint of 600mx600m will be placed and appropriately sited within the MTS development area considering technical and environmental constraints.
- One feasible site has been identified for the Collector Substation. A development area of 1051ha has been investigated in this BA process within which the development footprint of +/-5Ha will be placed considering technical and environmental constraints.
- The 132kV power line corridor from the Collector Substation to the MTS is 300m wide and approximately 7km long. The power line servitude of up to 40m will be appropriately placed within this corridor considering technical and environmental constraints.
- A 500m development corridor is considered for the 2 X 400kV LILO power lines to connect the MTS to the electricity grid. A servitude of 60m per line will be appropriately placed within this corridor considering technical and environmental constraints.

The site is easily accessible via the existing District gravel road between Nelspoort and Murraysburg No. MR 587 (**Figure 2.1**).

A summary of the details and dimensions of the planned infrastructure associated with the project is provided in **Table 2.1.** The confirmed details and dimensions of the development footprint were assessed as part of the independent specialist studies undertaken as part of the Basic Assessment process. **Figure 2.2** illustrates the proposed development footprint of the project assessed as part of this BA report.

Table 2.2 provides the details regarding the requirements and the activities to be undertaken during the project development phases.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Legend
Belvedere Solar Energy Facility
Collector Substation
Overhead lines
Proposed Site Access Point
Proposed Site Access Road to Collector Substation
MR587
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Image © 2022 CNES / Airbus
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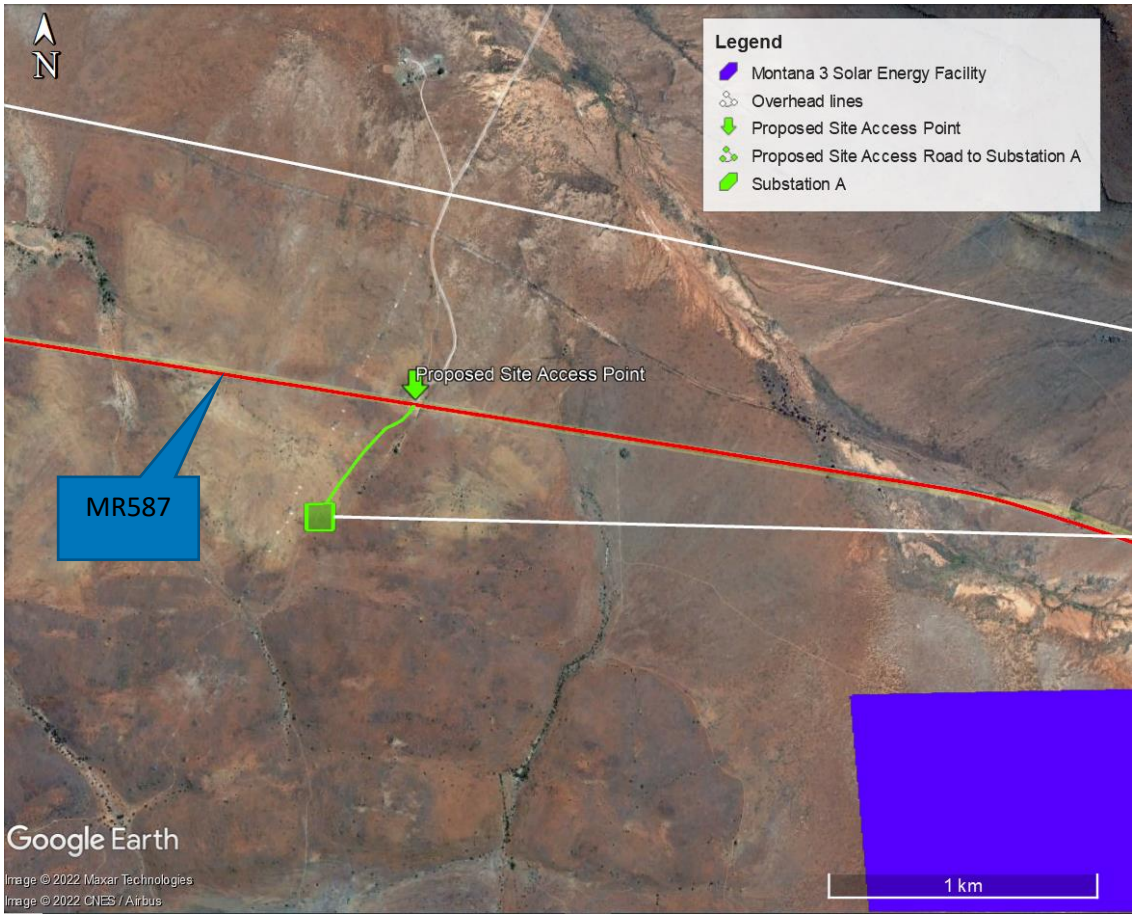
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Montana 3 Solar Energy Facility
Overhead lines
Proposed Site Access Point
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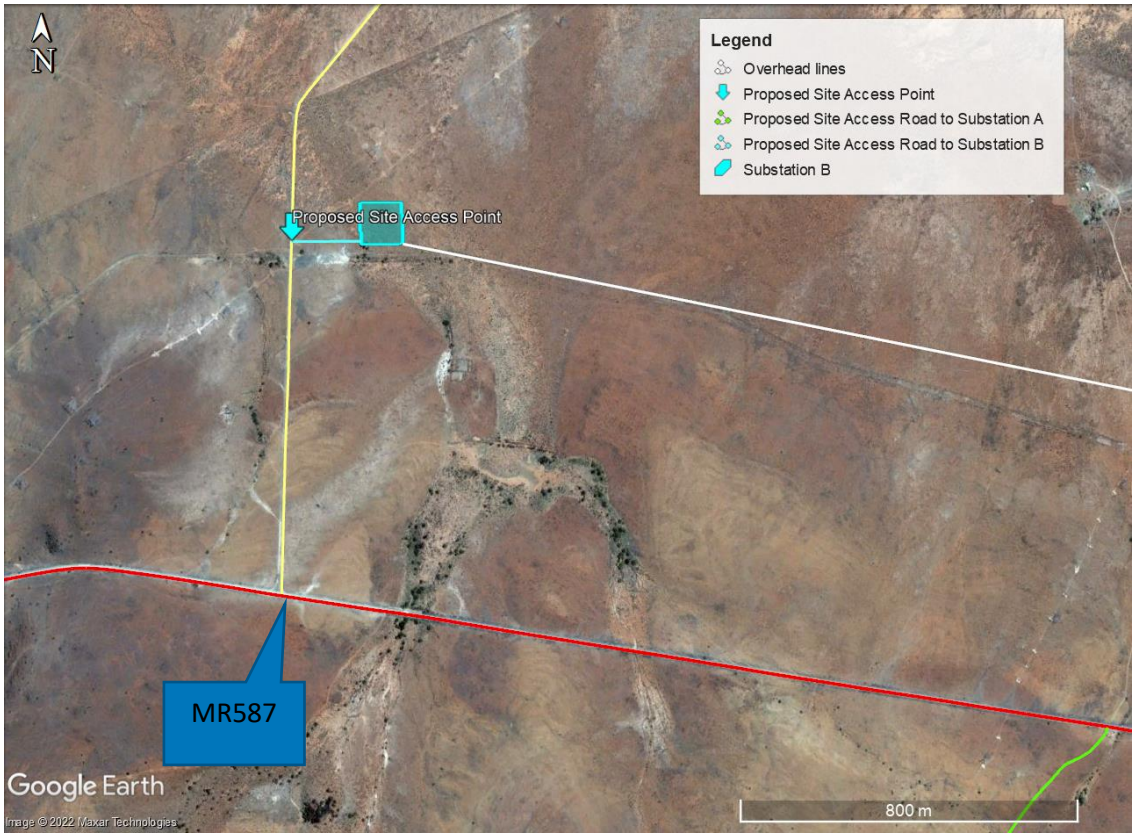


Figure 2.1: Location of the MR587 secondary road in relation to the project site

It must be noted that the development footprints of the MTS and power lines are proposed to be placed in any location within the MTS development envelope (500m) and the power line corridor (300m), respectively; however, a preferred location of the infrastructure within these areas have been identified by the applicant based on initial environmental sensitivities identified and technical considerations and has been assessed within this BA Report (**Figure 2.2**).

Table 2.1: Confirmed details or dimensions of the proposed development footprint of the Poortjie Wes Cluster Grid

Infrastructure	Footprint and dimensions
MTS	» Development footprint (permanent infrastructure) area: 600m x 600m » Capacity: 132kV/400kV » Height: ▪ Stringer strain beam: Up to 20m ▪ Tubular busbar: Up to 13m
Collector Substation	» Development footprint (permanent infrastructure) area: 600m x 600m » Capacity: 33kV/132kV » Height: ▪ Stringer strain beam: Up to 20m ▪ Tubular busbar: Up to 13m
Loop in Loop out power lines	» Capacity: 400kV » Servitude: 60m per line » Length: 1km » Height of towers: 40m
Power line from Collector Substation to MTS:	» Capacity: 132kV

Infrastructure	Footprint and dimensions
	» Length: 7km » Height of towers: 40m
Access and internal roads	Existing roads on the affected properties will be used where feasible and practical. The width of the roads at the access points will be up to 8m.
Temporary infrastructure total area	Temporary infrastructure (including laydown areas, a temporary security building, and a concrete batching plant) will be required during the construction phase. The total area of the temporary infrastructure is expected to be ~5ha. All areas affected by temporary infrastructure will be rehabilitated following the completion of the construction phase, where it is not required for the operation phase.
Services	During the construction phase, sanitation facilities will be provided, either using conservancy tanks, chemical toilets, or septic tanks and effluent will be disposed of at a registered sewage waste disposal site at either Beaufort West or Nelspoort. Based on the nature of the proposed grid connection infrastructure, no permanent staff is required for the operation phase and therefore no services are required during this development phase.
Storage of dangerous substances	The construction and operation will require the handling and storage of dangerous substances. The storage facilities will have a combined capacity of 80m^3 or more. The substances required to be stored will include transformer oil, fuel, etc.
Associated infrastructure	» Lighting » Fencing » Buildings required for operation (i.e., ablutions required for maintenance staff)

Figure 2.3 provides an illustration of the six renewable energy facility project sites and the associated 132kV power lines which will connect to the proposed Poortjie Wes LILO MTS.

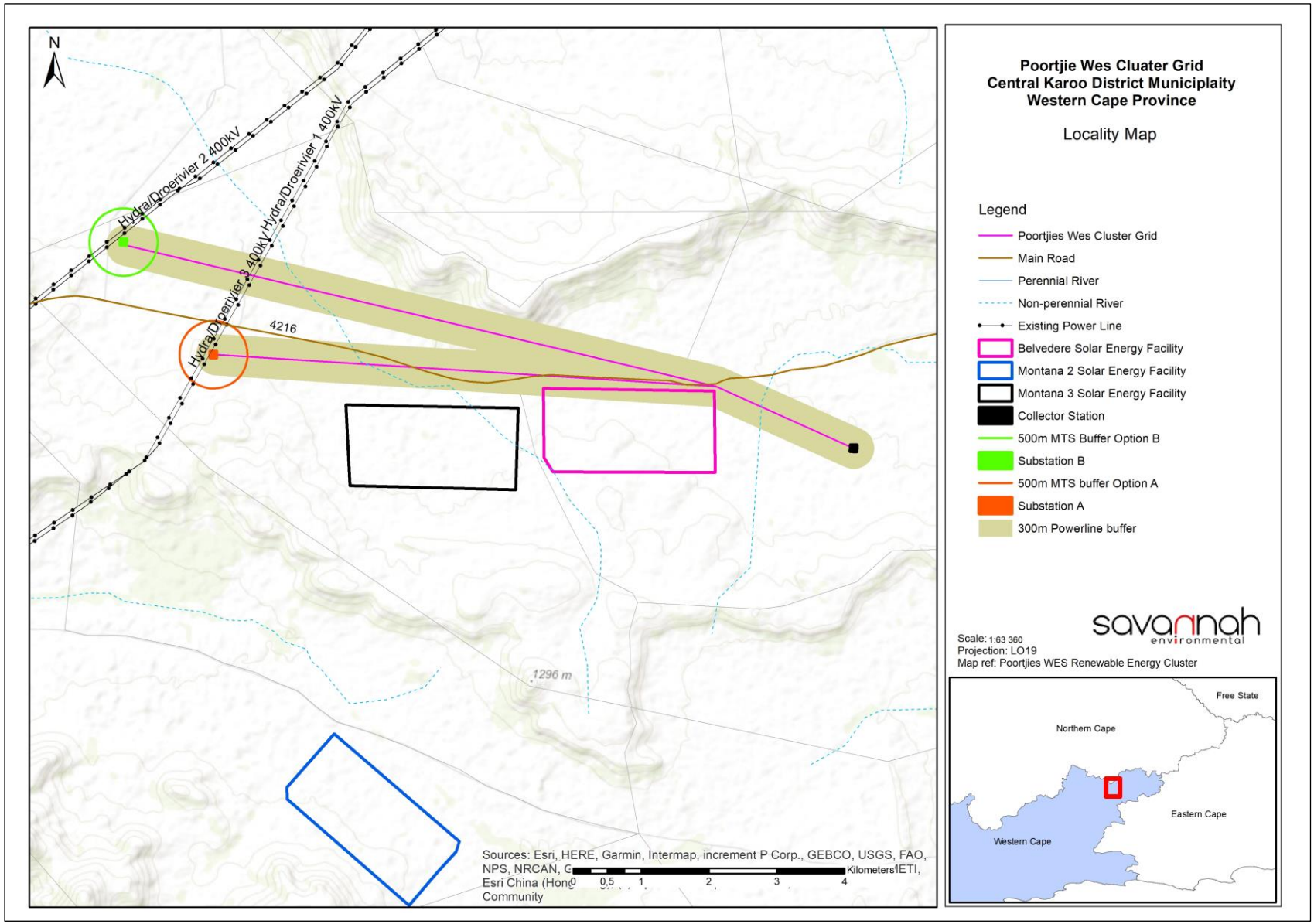


Figure 2.2: MTS development envelope, power line corridor, and development footprints of the proposed grid connection infrastructure assessed within this BA Report for the Poortjie Wes Cluster Grid

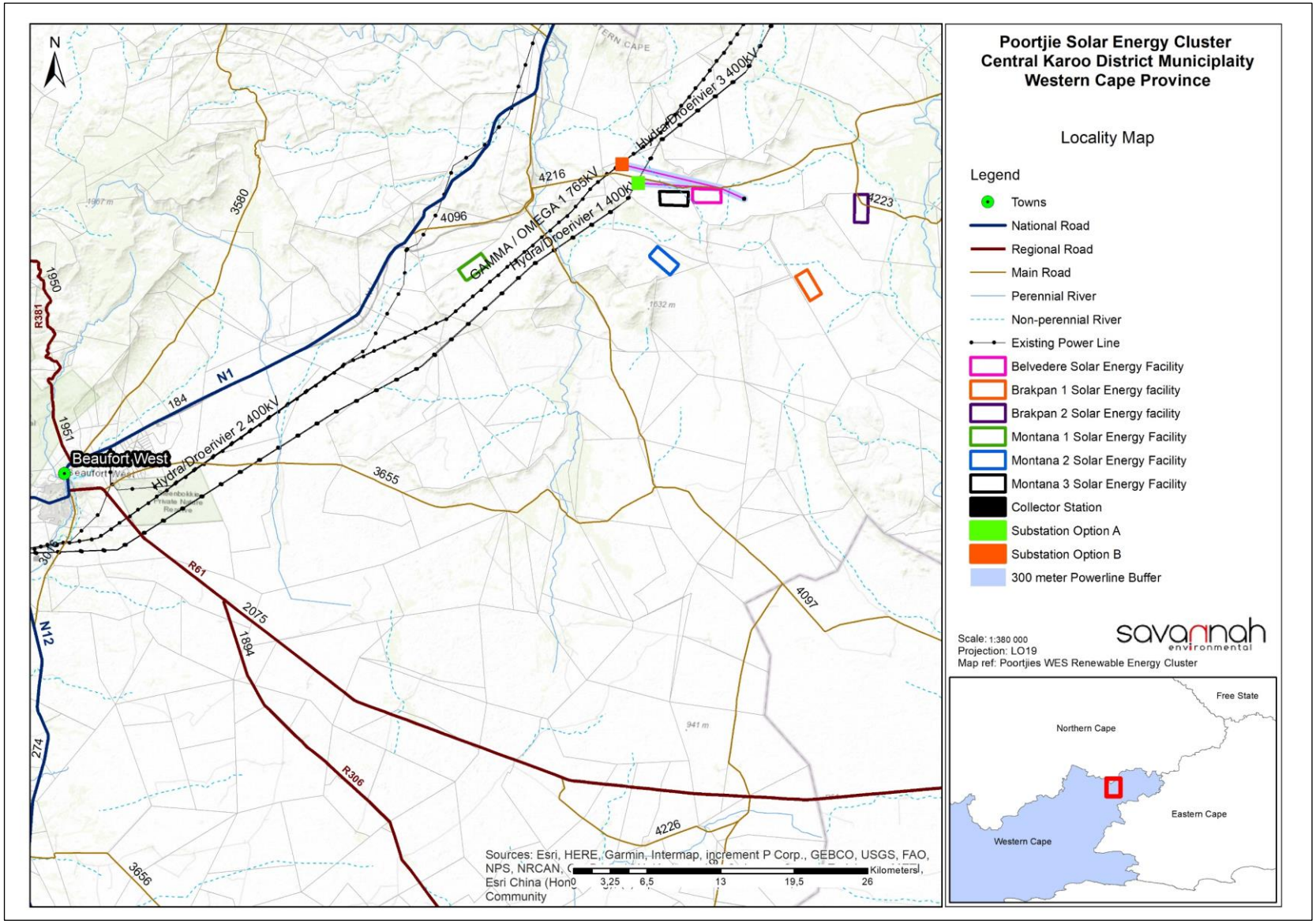


Figure 2.3: Illustration of the six renewable energy facility project sites and the associated 132kV power lines which connect to the proposed Poortjie Wes LILO MTS

2.2.3 Project Development Phases associated with the Poortjie Wes Cluster Grid

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

Construction Phase	
» The duration of the construction phase for the Poortjie Wes Cluster Grid will be 18 months. » Create direct construction employment opportunities. Up to 150 employment opportunities will be created during the construction phase and will mainly consist of highly skilled positions due to the complexity of the construction of the proposed grid connection infrastructure. » Overnight on-site worker presence would be limited to security staff. » Construction waste will be stored on site and waste removal and sanitation will be undertaken by a sub-contractor or the municipality. » Negligible water will be required for the construction phase and potable needs. If required, water will be sourced from existing boreholes in the project area subject to landowner agreement and obtaining the required water use authorisations. To ascertain the suitability of these existing resources for use within the project, yield and water quality tests be undertaken prior to use	
Construction sequence	Substations are constructed in the following simplified sequence: » Step 1: Conduct geotechnical investigations to determine founding conditions; » Step 2: Conduct site survey; » Step 3: Vegetation clearance and construction of access road; » Step 4: Site grading and levelling; » Step 5: Construction of foundations; » Step 6: Import of collector substation components; » Step 7: Construction of collector substation; » Step 8: Rehabilitation of disturbed areas and protection of erosion sensitive areas; and » Step 9: Testing (including quality control) and commissioning (in consultation with the switching specialist). Overhead power lines are constructed in the following simplified sequence: » Step 1: Surveying of the development corridor and negotiating with affected landowners; » Step 2: Final design and micro-siting of the infrastructure based on geo-technical, topographical conditions, and potential environmental sensitivities; obtain required environmental permits (such as 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.

Activities to be undertaken	
Conduct surveys prior to construction	» Including, but not limited to a geotechnical survey, site survey (including the location of the Collector Substation, MTS, and power line servitude) and all other associated infrastructure. » Search and rescue of floral species of concern (where required) and the identification and excavation of any sites of cultural/heritage value (where required) within the MTS footprint and the power line servitude.
Establishment of access roads	» Access roads/tracks to be established for construction and/or maintenance activities required. » Existing access roads will be utilised where possible to minimise impact and upgraded where required. » The width of the roads at the access points will be up to 8m. The internal access roads will be up to 4.5m wide and will have a servitude of 13.5m. The roads will be gravel in nature.
Undertake site preparation	» Clearance of vegetation at the Collector Substation location, MTS location, at tower positions within the power line servitude, site levelling, the establishment of access roads/tracks, and excavations for foundations. » Stripping of topsoil at the Collector Substation area, MTS footprint area, tower positions within the power line servitude, and along access roads. Soil to be stockpiled, used during rehabilitation, removed from the site, and/or spread on site. » The development footprint of the MTS will also be used for the storage of small components. Most of the equipment to be installed will be placed in the final position from the trucks transporting the equipment. These will require craneage and double handling is to be avoided at all costs. The storage area will therefore not be large and can be accommodated in shipping containers on-site within the MTS fenced footprint. » To be undertaken systematically to reduce the risk of exposed ground being subjected to erosion.
Establishment of laydown areas and batching plant on site	» A laydown area for the storage of project components, including the civil engineering construction equipment. » The laydown area will also accommodate building materials and equipment associated with the construction of buildings. » No borrow pits will be required. Infilling or depositing materials will be sourced from licenced borrow pits within the surrounding areas. » A temporary concrete batching plant of 50m x 50m in the extent to facilitate the concrete requirements for infrastructure foundations. Other options include the use of mobile batching plants that allow for *in situ* batching of concrete. Where smaller volumes of concrete are required, this will likely be mixed on site without a batching plant.
Undertake site rehabilitation	» 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.
<u>Operation Phase</u>	
» Duration will be ~50 years, or longer as needed for the operation of the renewable energy facilities. » Requirements for security and maintenance of the infrastructure.	

	» Employment opportunities relating mainly to operational activities and maintenance. Very limited employment opportunities will be available[6]. » Current land-use activities, i.e., grazing, can continue in the areas adjacent to the infrastructure.
Activities to be undertaken	
Operation and Maintenance	» Part-time security and maintenance staff. » Disposal of waste products (e.g., oil) in accordance with relevant waste management legislation. » On-going rehabilitation of those areas which were disturbed during the construction phase. » During this operation phase vegetation around the Collector Substation, MTS, and the power line will require management only if it impacts the safety and operational objectives of the project. » The maintenance of the infrastructure will be the responsibility of the holder of the Environmental Authorisation.
<u>Decommissioning Phase</u>	
Requirements	» Decommissioning of the Collector Substation, 400kV MTS, and power lines at the end of its economic life or when no longer required. » Decommissioning activities, if ultimately required, are to comply with the legislation relevant at the time.
Activities to be undertaken	
Site preparation	» Confirming the integrity of access to the Collector Substation, 400kV MTS, and the power lines to accommodate the required equipment. » Mobilisation of decommissioning equipment.
Disassemble components and rehabilitation	» Infrastructure 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, depending on the future land use of the affected areas and the relevant legislation applicable at the time of decommissioning.

It is expected that the areas of the project site affected by the infrastructure (development footprint) will revert to their original land use (i.e. primarily grazing) once the 400kV MTS and power lines have reached the end of their economic life and all infrastructure has been decommissioned.

[6] It must be noted that it is likely that the ownership of the Poortjie Wes Cluster Grid will be transferred to Eskom following the completion of construction. The operation and maintenance of the infrastracture will be undertaken by Eskom.

i) Water supply

A General Authorization (GA) for water uses in terms of Section 21a of the National Water Act (i.e. abstraction of water) is expected to be applicable to this project. The applicant has agreed with the landowners to use one of their existing boreholes. Registration forms for the GA will be submitted to the DWS.

The applicant has also applied to the Beaufort West Local Municipality for a water allocation.

ii) Handling and Disposal of Sewage During Construction and Post-Construction

A GA for water use in terms of Section 21(g) of the National Water Act (i.e. storage of wastewater underground in a conservancy tank with a capacity of up to 35m³) is expected to be applicable to this project. The wastewater will be collected by a third-party service provider regularly for disposal offsite at a licensed wastewater treatment facility. Registration forms for the GA will be submitted to the DWS.

The applicant has applied to the Beaufort West Local Municipality to dispose of the sewage at their authorised Nelspoort Wastewater Treatment Works.

2.3 Alternatives Considered during the BA Process

In accordance with the requirements of Appendix 1 of the 2014 Environmental Impact Assessment (EIA) Regulations (GNR 326), reasonable and feasible alternatives, including but not limited to site and technology alternatives, as well as the "do-nothing" alternative should be considered.

The DEA Guideline for determining alternatives states that the key criteria for consideration when identifying alternatives are that they should be "practicable", "feasible", "relevant", "reasonable" and "viable". Essentially there are two types of alternatives:

» Fundamentally (totally) different alternatives to the project.
» Incrementally different (modifications) alternatives to the project.

In this instance, the project' refers to the Poortjie Wes Cluster Grid, which is proposed to cater to six renewable energy facilities and enable grid connection for the evacuation of the electricity to be developed by an Independent Power Producer (IPP) and intended to provide electricity the National Grid.

2.3.1 Consideration of Fundamentally Different Alternatives

Fundamentally different alternatives are usually assessed at a strategic level and, as a result, project-specific environmental impact assessments (including BA processes) are therefore limited in scope and ability to address fundamentally different alternatives. At a strategic level, electricity-generating alternatives have been addressed as part of the DMRE's current Integrated Resource Plan for Electricity 2010 – 2030 (IRP)[7], and will continue to be addressed as part of future revisions (refer to Chapter 3 for more details). In this regard, the need for renewable energy power generation from renewable facilities has been identified as part of the technology mix for power generation in the country for the next 20 years. The Poortjie Wes Cluster Grid

[7] The Integrated Resource Plan (IRP) is a legislated policy that regulates power generation planning.

will enable the evacuation of the generated electricity into the national grid for use and therefore supports the development of renewable energy projects.

The fundamental energy generation alternatives were assessed and considered within the development of the IRP and the need for the development of renewable energy projects (including the associated required grid connection solutions) has been defined. Therefore, fundamentally different alternatives to the proposed project are not considered within this BA process.

2.3.2 Consideration of Incrementally Different Alternatives

Incrementally different alternatives relate specifically to the project under investigation. "Alternatives", in relation to a proposed activity, means different ways of meeting the general purposes and requirements of the activity, which may include alternatives for:

- The property on which, or location where the activity is proposed to be undertaken.
- The type of activity to be undertaken.
- The design or layout of the activity.
- The technology to be used in the activity.
- The operational aspects of the activity.

In addition, the option of not implementing the activity (i.e., the "do-nothing" alternative) must also be considered.

The sections that follow describe the incrementally different alternatives being considered as part of the Poortjie Wes Cluster Grid. Where no alternative is being considered, a motivation has been provided as required by the EIA Regulations, 2014, as amended.

2.4 Project Alternatives under Consideration for the Poortjie Wes Cluster Grid

2.4.1 Site Alternatives

The Poortjie Wes Cluster Grid site is planned for the area between Nelspoort and Beaufort West. This area falls within the Beaufort West REDZ (REDZ 11) and the Central Strategic Transmission Corridor. The area was designated as a REDZ and Strategic Transmission Corridor by the favourable solar resource and existing and planned grid connection infrastructure. As a result, the area has been identified by various IPPs as a suitable area for the development of commercial renewable energy facilities with the main aim to supply the electricity generated to the national grid or to private off-takers who need to shift towards cleaner and more sustainable sources of energy. The power from these facilities is required to be fed into the national grid. The requirement for the Poortjie Wes Cluster Grid to facilitate this connection was therefore identified.

The preferred project site was identified through an investigation of prospective sites and properties in the area between Beaufort West and Nelspoort in the Western Cape. The investigation involved the consideration of specific characteristics within the province and specifically within the areas north-west of Beaufort West, where various renewable energy facilities are proposed. The characteristics considered were identified by the developer as the main aspects that play a role in the opportunities and limitations for the

development of the Poortjie Wes Cluster Grid for the evacuation of renewable energy. The characteristics considered, and the results thereof, are discussed in the sections below.

» ***Land Availability and Location*** – To develop the Poortjie Wes Cluster Grid, sufficient space is required. The preferred project site was identified within the Western Cape Province following the confirmation of the renewable energy resources for the solar facilities for which the Poortjie Wes Cluster Grid will provide a grid connection solution. The properties included in the project site are privately-owned parcels available in the area for a development of this nature through agreement with the landowners and are deemed technically feasible by the project developer for such development to take place. The combination of the affected properties has an extent of ~9 730ha, which was considered by the developer as sufficient for the development footprint required by the Poortjie Wes Cluster Grid. This footprint was informed by the consideration of environmental constraints and sensitivities, as discussed further below.

Furthermore, the location of the project site in relation to the proposed renewable energy facilities that it will cater to is considered to be ideal as it is centrally located to these proposed developments and is therefore preferred from a technical perspective for the proposed facilities to gain access into and connect to the Poortjie Wes Cluster Grid Infrastructure.

» ***Geographical and Topographical Considerations*** – The study area is located on flat high-lying land with hills to the north and south where the elevation ranges from 1120 m above sea level (a.s.l) on the site itself to1520 a.s.l for the Bruinrug and Vaalkoppe to the north and south respectively. The land cover consists predominately of shrubland and bare rock and soil. Small areas of dryland agriculture and exotic plantations are present. The study area is located predominately within the Nama Karoo biome, with rainfall ranging from 123 mm -248 mm per annum. The majority of the study area is sparsely populated and consists of a landscape of wide-open expanses and extreme isolation. The scarcity of water and other natural resources has influenced settlement within this region, keeping numbers low, and distribution limited to the availability of permanent water. Settlements, where they occur, are usually rural homesteads and farmsteads.

The entire project site is located within the Central Corridor of the Strategic Transmission Corridors and the development of the Poortjie Wes Cluster Grid is considered to be a strategic placement of supporting transmission and distribution infrastructure (required for the development of renewable energy developments) to enable renewable energy development and the evacuation of the generated power.

Furthermore, the topography of the project site (being relatively flat) has been confirmed as ideal for the construction of a Collector Substation, 400 MTS, and associated power lines from a technical perspective. The flat topography also reduces the need for intense groundworks. Therefore, from a topographical perspective, there are very few physical constraints present that would have an effect on the construction of the proposed infrastructure.

» ***Existing Infrastructure*** – The availability of existing road and grid connection infrastructure was also considered by the developer in determining the location for the placement of the Poortjie Wes Cluster Grid, as this will enable the use of infrastructure already available and reduce the disturbance associated with the construction of the associated infrastructure and connection to the grid. The existing road network within the surrounding areas and the project site makes access to the development area

possible, with the proximity of the project site to the N12 and existing local district roads considered highly beneficial.

The location of the project site in proximity to two (2) 400kV transmission lines that bisect the renewable energy development sites was also considered. Critical in the selection process was that there is available capacity on these existing 400kV main transmission lines to accommodate the electricity from the renewable energy developments. This has been confirmed by Eskom in the Cost Estimate Letter received by the developer, which indicated that connection to either of the 400kV Droërivier-Hydra power lines is feasible.

» ***Environmental Screening and consideration of sensitive environmental features*** – Following the confirmation of the preferred project site as being technically feasible for the evacuation of electricity from various renewable energy facilities, the developer commenced with the environmental screening of the site, to evaluate the main constraints and opportunities and determine whether or not there were any potential fatal flaws or significant no-go areas that might compromise or limit the development of the infrastructure. The screening exercise took place prior to the commencement of the BA process and included specialist investigations of the broader area, which included the project sites of the renewable energy facilities and the Poortjie WES Cluster Grid site. This included field investigations by the specialist team appointed to undertake the BA studies, as well as desk-top consideration of environmental constraints. The purpose of this phase of the process was to identify sensitive and no-go areas, as well as determination of appropriate buffers to be considered during the development of the project layout. The sensitivity spatial data compiled by the specialist team for this broader area was provided to the applicant prior to the lodging of the application for environmental authorisation. Through the integration of the specialist sensitivity data obtained, based on field surveys, the developer identified the project site and optimised the development area for the Poortjie Wes Cluster Grid within the project site and the development footprint. This has resulted in the consideration of a development area as part of the BA process which is designed to be environmentally appropriate as far as possible.

Based on the above considerations, the project site was identified by the developer as being the most technically feasible and viable project site within the broader area for further investigation in support of an application for authorisation. No feasible alternative sites were identified for assessment as part of this BA process. The site selection and layout optimisation process applied by the developer (which includes the process followed above) demonstrates due consideration of the suitability of the project site for the Poortjie Wes Cluster Grid in line with a typical mitigation hierarchy:

1. First Mitigation: avoidance of adverse impacts as far as possible by the use of preventative measures (in this instance an environmental screening and integration process assisted in the avoidance of identified sensitive areas).
2. Second Mitigation: minimisation or reduction of adverse impacts to 'as low as practicable' through the implementation of mitigation and management measures (in this instance the development of technical mitigation solutions as well as recommendations from the various environmental specialists).
3. Third Mitigation: remedy or compensation for adverse residual impacts, which are unavoidable and cannot be reduced further.

2.4.2 Layout Alternatives

The following layout alternatives have been identified by the applicant for consideration in the BA process:

Project Component	Alternatives identified
Collector Substation	Only one feasible site has been identified for the location of the Collector Substation. This is located on the Farm Belvedere No.73. A larger development area of 1051ha is being investigated around the substation to allow for the avoidance of any identified environmental sensitivities.
MTS	Two alternatives have been identified for the development of the 400kV MTS. The alternative to be implemented will be informed by environmental sensitivities and will be determined in consultation with Eskom, depending on which one of the two 400kV Droërivier/-Hydra OHL power lines are identified as the preferred connection point. A larger development area in the form of 500m buffers is being investigated around the substation to allow for the avoidance of any identified environmental sensitivities.
400kV LILO power lines	Alternative locations for the LILO power lines from the MTS are linked to the location of the MTS. A 500m development corridor is considered for the two proposed loop-in loop-out 400kV power lines to connect the MTS to the electricity grid. A servitude of 60m per line will be appropriately placed within this corridor considering technical and environmental constraints.
132kV power line	Two alternative power line corridors between the Collector Substation and the MTS have been identified for investigation in this BA process. Each corridor is 300m wide and approximately 7km long. The power line servitude of up to 40m will be appropriately placed within this corridor considering technical and environmental constraints.

2.4.3 Activity and Technology Alternatives

The activity proposed to be implemented and the technology proposed to be developed (i.e., construction and operation of a 132 kV Collector Switching Station, 132kV line, 400kV MTS, and 400kV power lines is linked to the grid connection infrastructure required to evacuate the generated renewable electricity from the six proposed renewable energy facilities. The activity is therefore specific to the technical requirements of the proposed renewable energy facilities. The development of the grid infrastructure is considered to be the most appropriate and efficient solution for the evacuation of the generated electricity from the six renewable energy facilities as it reduces the grid connection infrastructure required for each project and consolidates the required grid infrastructure to one area, thereby minimising the distribution of disturbance.

No activity or technology alternatives are proposed for consideration.

2.4.4 The 'do-nothing' Alternative

The 'do-nothing' alternative is the option of Poortjie Wes Cluster Grid (Pty) Ltd not constructing the Poortjie Wes Cluster Grid on the proposed site. This would result in no environmental or social impacts (positive or negative) as a result of the development of the proposed infrastructure. This alternative is assessed in detail within Chapter 7 of this BA Report.

CHAPTER 3: POLICY AND LEGISLATIVE CONTEXT

This Chapter provides an overview of the policy and legislative context within which the Poortjie Wes Cluster Grid is proposed. It identifies environmental legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks, and instruments that apply to this activity and are to be considered in the assessment process which may apply to or have bearing on the proposed project. It also provides information that supports the need and justification for the project, as discussed in Chapter 4. Environmental legislation and associated permitting procedures relevant to the project are described and considered in Chapter 5 of this BA Report.

The Poortjie Wes Cluster Grid is regarded as an essential infrastructure for the evacuation of electricity from the proposed six renewable energy facilities which form part of the Poortjies Wes Cluster to the national grid or for use by private off-takers. Therefore, the regulatory hierarchy, legislation, policies, and plans from a national, provincial, and local level that are relevant for the development of the renewable energy facilities are relevant *and* directly linked to the development of the Poortjie Wes Cluster Grid.

3.1 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 the Poortjie Wes Cluster Grid is proposed is included and considered within this chapter.

3.2 Strategic Electricity Planning in South Africa

The need to expand electricity generation capacity in South Africa is based on national policy and informed by ongoing strategic planning undertaken by the Department of Mineral Resources and Energy. The hierarchy of policy and planning documentation that supports the development of renewable energy projects, such as solar energy facilities, is illustrated in **Figure 3.1**. These policies are discussed in more detail in the following sections, along with the provincial and local policies and plans that have relevance to the development of the Poortjie Wes Cluster Grid.

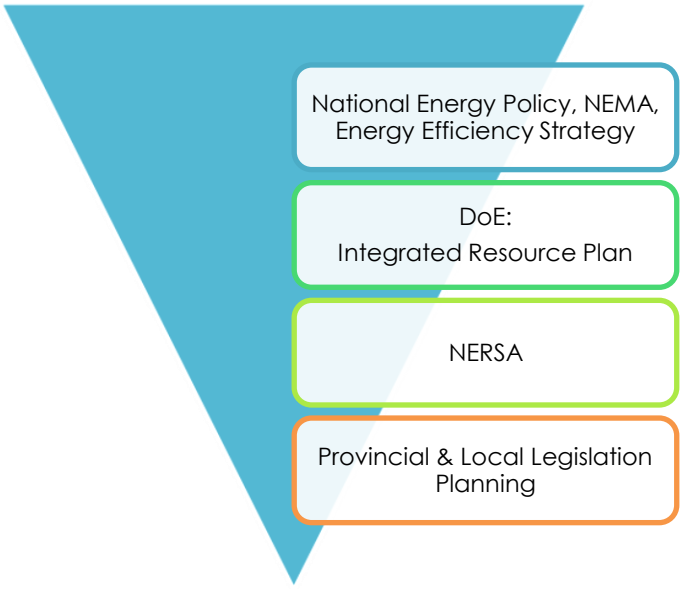


Figure 3.1: Hierarchy of electricity and planning documents

The South African energy industry is evolving rapidly, with regular changes to legislation and industry role-players. The regulatory hierarchy for an energy generation 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. As wind energy developments are a multi-sectoral issue (encompassing economic, spatial, biophysical, and cultural dimensions) various statutory bodies are likely to be involved in the approval process of a renewable energy project (and the required associated grid infrastructure) and the related statutory environmental assessment process.

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

- **Department of Mineral Resources and Energy (DMRE):** This Department is responsible for policy relating to all energy forms and for compiling and approving the Integrated Resource Plan (IRP) for electricity since merging with the Department of Mineral Resources (DMR) is also responsible for granting approvals for the use of land that is contrary to the objects of the Mineral and Petroleum Resource Development Act, 2002 (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 resources that may occur within the broader study area.
- **National Energy Regulator of South Africa (NERSA):** NERSA is responsible for regulating all aspects of the electricity sector and will ultimately issue licenses for IPP projects to generate electricity.
- **Department of Forestry, Fisheries and the Environment (DFFE):** 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. DFFE is the competent authority for this project (as per GNR 779 of 01 July 2016) and is charged with considering whether to grant an 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, 1998(No. 84 of 1998) (NFA). The Department is also responsible for permits for Threatened or Protected Species (TOPS) under the National Environmental Management: Biodiversity Act 10 of 2004.

- **The South African Heritage Resources Agency (SAHRA):** SAHRA is a statutory organisation established under the National Heritage Resources Act, 1999 (No. 25 of 1999) (NHRA), as the national administrative body responsible for the protection of South Africa's cultural heritage.
- **South African National Roads Agency Limited (SANRAL):** This Agency is responsible for the regulation and maintenance of all national road routes.
- **Department of Water and Sanitation (DWS):** This Department is responsible for effective and efficient water resource management to ensure sustainable economic and social development. This Department is also responsible for evaluating applications and issuing licenses pertaining to water use (i.e., Water Use Licenses (WUL) and General Authorisations).
- **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 agricultural sector and the initiation, facilitation, coordination, and implementation of integrated rural development programmes.

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

- **Western Cape Department of Environmental Affairs and Development Planning (DEA&DP):** This Department is the commenting authority for the Basic Assessment process for the proposed project.
- **The Western Cape Nature Conservation Board trading as CapeNature:** This Department is the commenting authority for the BA process for the project and is responsible for issuing of other biodiversity and conservation-related permits.
- **Western Cape Department of Transport and Public Works:** This Department provides effective co-ordination of crime prevention initiatives, provincial police oversight, traffic management, and road safety towards a more secure environment.
- **Heritage Western Cape:** This Department identifies, conserves, and manages heritage resources throughout the Western Cape Province.

At the **Local Level,** the local and district municipal authorities are the principal regulatory authorities responsible for planning, land use, and the environment. In the Western Cape Province, both the local and district municipalities play a role. The local municipality includes the **Beaufort West Local Municipality** which forms part of the **Central Karoo District Municipality**. In terms of the Municipal Systems Act, 2000 (No. 32 of 2000), goal municipalities must go through an Integrated Development Planning (IDP) process to prepare a five-year strategic development plan for the area under their control.

3.3 International Policy and Planning Context

A brief review of the most relevant international policies relevant to the establishment of the Poortjie Wes Cluster Grid (and the renewable energy facilities it will cater to) are provided below in **Table 3.1**. The Poortjie Wes Cluster Grid is considered to be aligned with the aims of these policies, even if contributions to achieving the goals therein are only minor.

Table 3.1: International policies relevant to the Poortjie Wes Cluster Grid

Relevant policy	Relevance to the Poortjie Wes Cluster Grid
United Nations Framework Convention on Climate Change (UNFCCC) and	The Conference of the Parties (COP), established by Article 7 of the UNFCCC, is the supreme body and highest decision-making organ of the Convention. It reviews the implementation of the Convention and any related legal instruments and takes decisions to promote the effective implementation of the Convention.

Relevant policy	Relevance to the Poortjie Wes Cluster Grid
Conference of the Party (COP)	The Conference of the Parties (COP) 21 was held in Paris from 30 November to 12 December 2015. From this conference, an agreement to tackle global warming was reached between 195 countries. This Agreement is open for signature and subject to ratification, acceptance or approval by States and regional economic integration organisations that are Parties to the Convention from 22 April 2016 to 21 April 2017. Thereafter, this Agreement shall be open for accession from the day following the date on which it is closed for signature. The agreement can only be sanctioned once it has been ratified by 55 countries, representing at least 55% of emissions. South Africa signed the Agreement in April 2016 and ratified the agreement on 01 November 2016. The Agreement was assented to by the National Council of Provinces on 27 October 2016, and the National Assembly on 1 November 2016. The Agreement was promulgated on 04 November 2016, thirty days after the date on which at least 55 Parties to the Convention, which account for at least 55% of the total global greenhouse gas emissions have deposited their instruments of ratification, acceptance, approval, or accession with the Depositary. The Paris Agreement set out that every 5 years countries must set out increasingly ambitious climate action. This meant that, by 2020, countries needed to submit or update their plans for reducing emissions, known as nationally determined contributions (NDCs). The COP26 summit held in 2021 brought parties together to accelerate action towards the goals of the Paris Agreement and the UN Framework Convention on Climate Change. On 13 November 2021, COP26 concluded in Glasgow with all countries agreeing on the Glasgow Climate Pact to keep 1.5˚C alive and finalise the outstanding elements of the Paris Agreement. 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) Green House Gas (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. The policy provides support for the Poortjie Wes Cluster Grid (and the renewable energy facilities it will cater for), which will contribute to managing climate change impacts, supporting the emergency response capacity, as well as assisting in sustainably reducing GHG.
The Equator Principles 4 (October 2020)	The Equator Principles (EPs) 4 constitute a financial industry benchmark used for determining, assessing, and managing a project's environmental and social risks. The EPs are primarily intended to provide a minimum standard for due diligence to support responsible risk decision-making. The EPs apply to large infrastructure projects (such as Brakpan 1 Solar Energy Facility) and apply globally to all industry sectors. Such an assessment should propose measures to minimise, mitigate, and offset adverse impacts in a manner relevant and appropriate to the nature and scale of Brakpan 1 SEF. In terms of the EPs, South Africa is a non-designated country, and as such, the assessment process for projects located in South Africa evaluates compliance with the

Relevant policy	Relevance to the Poortjie Wes Cluster Grid
	applicable IFC Performance Standards on Environmental and Social Sustainability, and Environmental Health and Safety (EHS) Guidelines. The Poortjie Wes Cluster Grid is currently being assessed in accordance with the requirements of the 2014 EIA Regulations, as amended (GN R326), published in terms of Section 24(5) of the National Environmental Management Act, 1998 (No. 107 of 1998) (NEMA), which is South Africa's national legislation providing for the authorisation of certain controlled activities. Through this assessment, all potential social and environmental risks are identified and assessed, and appropriate mitigation measures are proposed.
International Finance Corporation (IFC) Performance Standards and Environmental and Social Sustainability (January 2012)	The International Finance Corporation's (IFC) Performance Standards (PSs) on Environmental and Social Sustainability were developed by the IFC and were last updated on 1 January 2012. Performance Standard 1 requires that a process of environmental and social assessment be conducted, and an Environmental and Social Management System (ESMS) appropriate to the nature and scale of the project, and commensurate with the level of its environmental and social risks and impacts, be established and maintained. The above-mentioned standard is the overarching standard to which all the other standards relate. Performance Standards 2 through 8 establish specific requirements to avoid, reduce, mitigate, or compensate for impacts on people and the environment, and to improve conditions where appropriate. While all relevant social and environmental risks and potential impacts should be considered as part of the assessment, standards 2 and 8 describe potential social and environmental impacts that require particular attention specifically within emerging markets. Where social or environmental impacts are anticipated, the developer is required to manage them through its ESMS consistent with Performance Standard 1. Given the nature of the Poortjie Wes Cluster Grid, it is anticipated (at this stage of the process) that Performance Standards 1, 2, 3, 4, 6, and 8 may apply to the project.

3.4 National Policy

National policies must be considered for the construction and operation of the Poortjie Wes Cluster Grid to ensure that the development is in line with the planning of the country. A brief review of the most relevant national policies is provided below. The development of Poortjie Wes Cluster Grid is considered to align with the aims of these policies as it will support the implementation of renewable energy projects, even where contributions to achieving the goals therein are only minor.

3.4.1 The National Energy Act, 2008 (No. 34 of 2008)

The purpose of the National Energy Act, 2008 (No. 34 of 2008) is to ensure that diverse energy resources are available, in sustainable quantities and at affordable prices, to the South African economy in support of economic growth and poverty alleviation, while considering environmental management requirements and interactions amongst economic sectors, as well as matters relating to renewable energy. The National Energy Act also provides for energy planning, increased generation and consumption of renewable energies, contingency energy supply, holding of strategic energy feedstocks and carriers, adequate investment in, appropriate upkeep, and access to energy infrastructure. The Act provides measures for the furnishing of certain data and information regarding energy demand, supply, and generation, and for

establishing an institution to be responsible for the promotion of efficient generation and consumption of energy and energy research.

The Act provides the legal framework which supports the development of power generation facilities and the required associated grid infrastructure such as the Poortjie Wes Cluster Grid.

3.4.2 White Paper on the Energy Policy of South Africa, 1998

The South African Energy Policy, published by the then Department of Minerals and Energy (DME) in December 1998 identifies five key objectives, namely:

- Increasing access to affordable energy services.
- Improving energy sector governance.
- Stimulating economic development.
- Managing energy-related environmental impacts.
- Securing supply through diversity.

To meet these objectives and the developmental and socio-economic objectives of South Africa; the country needs to optimally use available energy resources. The South African Government is required to address what can be done to meet these electricity needs both in the short and long term. The Energy Policy identifies key objectives for energy supply, such as increasing access to affordable energy services, managing energy-related environmental impacts, and securing energy supply through diversifying South Africa's electricity mix.

This policy recognises that renewable energy applications have specific characteristics which need to be considered. The Energy Policy is "*based on the understanding that renewables are energy sources in their own right, and are not limited to small-scale and remote applications, and have significant medium- and long-term commercial potential*." In addition, the Energy Policy states that "*Renewable resources generally operate from an unlimited resource base and, as such, can increasingly contribute towards a long-term sustainable energy future*."

The support for the Energy Policy is guided by a rationale that South Africa has an extremely attractive range of renewable resources, particularly wind and solar, and that renewable applications are, in fact, the least cost energy service in many cases from a fuel resource perspective (i.e., the cost of fuel in generating electricity from such technology), more so when social and environmental costs are considered. Despite this range of resources, the National Energy Policy acknowledges that the development and implementation of renewable energy applications have been neglected in South Africa.

Government policy on renewable energy is therefore concerned with addressing the following challenges:

- Ensuring that economically feasible technologies and applications are implemented.
- Ensuring that an equitable level of national resources is invested in renewable technologies, given their potential, and compared to investments in other energy supply options.
- Addressing constraints on the development of the renewable industry.

3.4.3 White Paper on the Renewable Energy Policy, 2003

The White Paper on Renewable Energy Policy supplements the Government's overarching policy on energy as set out in its White Paper on the Energy Policy of the Republic of South Africa (DME, 1998), which pledges *'Government support for the development, demonstration, and implementation of renewable energy sources for both small and large-scale applications'*.

This White Paper on Renewable Energy sets out Government's vision, policy principles, strategic goals, and objectives for promoting and implementing renewable energy in South Africa. The main aim of the policy is to create the conditions for the development and commercial implementation of renewable technologies. The position of the White Paper on Renewable Energy is based on the integrated resource planning criterion of:

"Ensuring that an equitable level of national resources is invested in renewable technologies, given their potential and compared to investments in other energy supply options."

The White Paper on Renewable Energy sets out the Government's vision, policy principles, strategic goals, and objectives for promoting and implementing renewable energy in South Africa. It also informs the public and the international community of the Government's vision, and how the Government intends to achieve these objectives and informs Government agencies and organs of their roles in achieving the objectives.

South Africa relies heavily on coal to meet its energy needs because it is well-endowed with coal resources in particular. However, South Africa is endowed with renewable energy resources that can be sustainable alternatives to fossil fuels, but which have so far remained untapped. This White Paper fosters the uptake of renewable energy in the economy and has several objectives that include:

» Ensuring that equitable resources are invested in renewable technologies.
» Directing public resources for the implementation of renewable energy technologies.
» Introducing suitable fiscal incentives for renewable energy.
» Creating an investment climate for the development of the renewable energy sector.

The objectives of the White Paper on Renewable Energy are considered in six focal areas, namely:

i) Financial instruments.
ii) Legal instruments.
iii) Technology development.
iv) Awareness raising.
v) Capacity building and education.
vi) Market-based instruments and regulatory instruments.

This policy supports the investment in renewable energy facilities (and the required associated grid infrastructure) as they contribute to ensuring energy security through the diversification of energy supply, reducing Greenhouse Gas (GHG) emissions, and the promotion of renewable energy sources.

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

The Electricity Regulation Act, 2006 (No. 04 of 2006) (ERA) as amended by the Electricity Regulation Act, 2007 (No. 28 of 2007), replaced the Electricity Act, 1987 (No. 41 of 1987), as amended, except for Section 5B, which provides funds for the energy regulator to regulate 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 how the generation, transmission, distribution, reticulation, trading, and import and export of electricity is regulated. Projects developed by IPPs which exceed 100MW in capacity are required to obtain a Generation License from the NERSA.

3.4.5 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 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 will look very different from the current situation: coal will contribute proportionately less to primary-energy needs, while gas and renewable energy resources – especially wind, solar, and imported hydroelectricity – will play a much larger role.

3.4.6 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 that 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 assessing the potential impacts of various factors such as proposed policies, the 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 consider 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.

3.4.7 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 the least-cost electricity supply and demand balance, considering the 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.

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

- A total of 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 as of 31 March 2021[8] with 5 078MW from 79 IPP projects operational and made available to the grid[9].
- 2 000MW of generating capacity (comprising various technologies) has been awarded to 8 Independent Power Producers under the RMIPPPP in March 2021.
- 2 583MW of electricity in bid window 5 of the REIPPPP, announced on 28 October 2021 (DMRE, 2021).
- 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.

Besides capacity additions, several 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 before 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 the year 2025 decline.

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

8 Bid windows1, 2 ,3, 3.5, 4 and small BW1(1S2) and small BW2(2S2). 2 583 MW of renewable energy capacity was awarded to IPPs in the REIPPPP bid window 5 in October 2021.

[9]https://www.cliffedekkerhofmeyr.com/en/news/publications/2019/Corporate/energy-alert-22-october-The-Integrated-Resource-Plan-2019-A-promising-future-roadmap-for-generation-capacity-in-South-Africa.html

	Coal	Coal (Decommis-sioning)	Nuclear	Hydro	Storage	PV	Wind	CSP	Gas & Diesel	Other (Distributed Generation, CoGen, Biomass, Landfill)
Current Base	37,149		1 860	2,100	2 912	1 474	1 980	300	3 830	499
2019	2,155	-2,373					244	300		Allocation to the extent of the short term capacity and energy gap.
2020	1,433	-557				114	300			
2021	1,433	-1403				300	818			
2022	711	-844			513	400 1,000	1,600			
2023	750	-555				1000	1,600			500
2024			1,860				1,600		1000	500
2025						1000	1,600			500
2026		-1,219					1,600			500
2027	750	-847					1,600		2000	500
2028		-475				1000	1,600			500
2029		-1,694			1575	1000	1,600			500
2030		-1,050		2,500		1000	1,600			500
TOTAL INSTALLED CAPACITY by 2030 (MW)	33,364		1,860	4,600	5,000	8,288	17,742	600	6,380	
% Total Installed Capacity (% of MW)	43		2.36	5.84	6.35	10.52	22.53	0.76	8.1	
% Annual Energy Contribution (% of MWh)	58.8		4.5	8.4	1.2*	6.3	17.8	0.6	1.3	

Installed Capacity
Committed/Already Contracted Capacity
Capacity Decommissioned
New Additional Capacity
Extension of Koeberg Plant Design Life
Includes Distributed Generation Capacity for own use

- 2030 Coal Installed Capacity is less capacity decommissioned between years 2020 and 2030.
- Koeberg power station rated/installed capacity will revert to 1,926MW (original design capacity) following design life extension work.
- Other/ Distributed generation includes all generation facilities in circumstances in which the facility is operated solely to supply electricity to an end-use customer within the same property with the facility.
- Short term capacity gap is estimated at 2,000MW.

Figure 3.2: IRP 2019 as promulgated in October 2019[10]

This plan provides for the development of 6000MW of new capacity from large scale PV. The proposed six renewable energy facilities would contribute towards this goal through the generation of electricity, with the proposed Poortjie Wes Cluster Grid enabling the evacuation of the generated electricity into the national grid for use by private off takers.

3.4.8 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, the 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.

[10] Source: https://www.cliffedekkerhofmeyr.com/en/news/publications/2019/Corporate/energy-alert-22-october-The-Integrated-Resource-Plan-2019-A-promising-future-roadmap-for-generation-capacity-in-South-Africa.html

3.4.9 National Climate Change Bill, 2018

On 08 June 2018, the Minister of Environmental Affairs published the National Climate Change Bill ("the Bill") for public comment. The purpose of the Bill is to build an effective climate change response and ensure the long-term, just transition to a climate-resilient and lower carbon economy and society. This will be done within the context of sustainable development for South Africa and will provide for all matters related to climate change.

The National Climate Change Bill addresses issues related to institutional and coordination arrangements across the three spheres of government namely national, provincial, and local. It further highlights the need for the spheres of government and entities, sectors as well businesses to respond to the challenges of climate change. The Bill further addresses the matters relating to, the national adaptation to impacts of climate change, greenhouse gas emissions and removals, and policy alignment and institutional arrangements. The Bill provides a procedural outline that will be developed through the creation of frameworks and plans. The following objectives are set within the Bill:

a) Provide for the coordinated and integrated response to climate change and its impacts by all spheres of government in accordance with the principles of cooperative governance.
b) Provide for the effective management of inevitable climate change impacts through enhancing adaptive capacity, strengthening resilience, and reducing vulnerability to climate change, to build social, economic, and environmental resilience and an adequate national adaptation response in the context of the global climate change response.
c) Make a fair contribution to the global effort to stabilise greenhouse gas concentrations in the atmosphere at a level that avoids dangerous anthropogenic interference with the climate system within a timeframe and in a manner that enables economic, employment, social, and environmental development to proceed sustainably.

The development of the six proposed renewable energy facilities and the evacuation of the electricity (through the Poortjie Wes Cluster Grid) would not result in the generation or release of emissions during its operation.

3.4.10 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.

As an integral part of the policy, a set of near-term priority flagship programmes will be implemented to address the challenges of climate change, one of which includes the Renewable Energy Flagship Programme. This flagship programme includes a scaled-up renewable energy programme, based on the current programme specified in the IRP 2010, and uses the evolving South African Renewables Initiative led by the Department of Public Enterprise and Department of Trade and Industry (DTI), as a driver for the

deployment of renewable energy technologies. The programme will be informed by enhanced domestic manufacturing potential and the implementation of energy efficiency and renewable energy plans by the local government.

The development of the proposed six renewable energy facilities, and the required Poortjie Wes Cluster Grid, is aligned with the Renewable Energy Flagship Programme identified under South Africa's NCCRP and could therefore be argued to be aligned with the country's approach to addressing climate change.

3.4.11 National Climate Change Response Strategy for South Africa, 2004

The need for a national climate change policy for South Africa was identified as an urgent requirement during the preparations for the ratification of the UNFCCC in 1997. A process to develop such a policy was thus instituted under the auspices of the National Committee for Climate Change (NCCC), a non-statutory stakeholder body set up in 1994 to advise the Minister on climate change issues and chaired by the then Department of Environmental Affairs and Tourism (DEAT). It was determined that a national climate change response strategy will promote integration between the programmes of the various government departments involved to maximise the benefits to the country as a whole, while minimising negative impacts. Further, as climate change response actions can potentially act as a significant factor in boosting sustainable economic and social development, a national strategy specifically designed to bring this about is clearly in the national interest, supporting the major objectives of the government including poverty alleviation and the creation of jobs.

Several principles and factors guided the conception of the strategy and is required to be implemented. These are:

- Ensuring that the strategy is consistent with national priorities, including poverty alleviation, access to basic amenities including infrastructure development, job creation, rural development, foreign investment, human resource development, and improved health, leading to sustainable economic growth.
- Ensuring alignment with the need to consistently use locally available resources.
- Ensuring compliance with international obligations.
- Recognizing that climate change is a cross-cutting issue that demands integration across the work programmes of other departments and stakeholders, and across many sectors of industry, business, and the community.
- Focussing on those areas that promote sustainable development.
- Promoting programmes that will build capacity, raise awareness, and improve education on climate change issues.
- Encouraging programmes that will harness existing national technological competencies.
- Reviewing the strategy constantly in the light of national priorities and international trends.
- Recognizing that South Africa's emissions will continue to increase as development is realised.

The strategy was devised through an integrated approach and considers policies and programmes of other government departments and the fact that South Africa is a developing country. This will ensure that the principles of sustainable development are served and do not conflict with existing development policies.

3.4.12 Strategic Integrated Projects (SIPs)

The Presidential Infrastructure Coordinating Committee (PICC) is integrating and phasing investment plans across 18 Strategic Infrastructure Projects (SIPs) which have five core functions: to unlock opportunity, transform the economic landscape, create new jobs, strengthen the delivery of basic services, and support the integration of African economies. A balanced approach is being fostered through the greening of the economy, boosting energy security, promoting integrated municipal infrastructure investment, facilitating integrated urban development, accelerating skills development, investing in rural development, and enabling regional integration. SIP 8 and 9 of the energy SIPs support the development of the renewable energy facilities, while SIP 10 supports the development of the Poortjie Wes Cluster Grid:

- SIP 8: Green energy in support of the South African economy: Support sustainable green energy initiatives on a national scale through a diverse range of clean energy options as envisaged in the Integrated Resource Plan (IRP 2010 – 2030) and supports biofuel production facilities.
- SIP 9: Electricity generation to support socio-economic development: The proposed six renewable energy facilities are a potential SIP 9 Project as electricity will be generated and social and economic upliftment, development, and growth will take place within the surrounding communities. SIP 9 supports the acceleration of the construction of new electricity generation capacity in accordance with the IRP 2010 to meet the needs of the economy and address historical imbalances.
- SIP10: Electricity transmission and distribution for all: the development of the Poortjie Wes Cluster Grid will enable the evacuation of renewable energy to the national grid for use by private off takers.

3.4.13 Strategic Transmission Corridors (GNR 113 of February 2018)

The Strategic Environmental Assessment for Electricity Grid Infrastructure has identified five Strategic Transmission Corridors that are of strategic importance for large-scale electricity transmission and distribution infrastructure, in terms of Strategic Integrated Project (SIP) 10: Electricity Transmission and Distribution. The Poortjie Wes Cluster Grid is located within the Central Strategic Transmission Corridor (**Figure 3.3**).

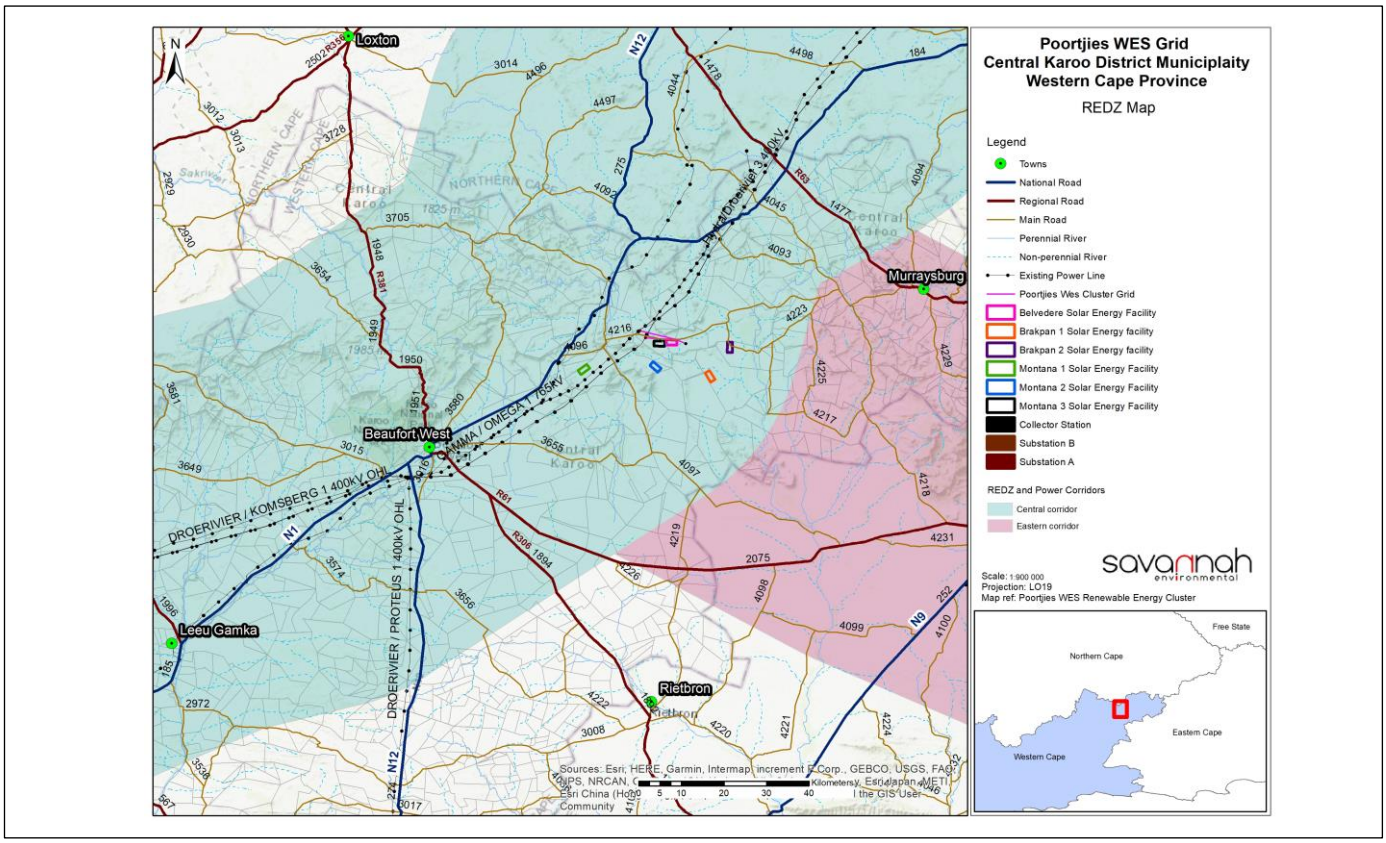


Figure 3.3: Location of the project site within the Central Strategic Transmission corridor (shown in blue)

3.4.14. National Biodiversity Economy Strategy (NBES) (March 2016)

The biodiversity economy of South Africa encompasses the businesses and economic activities that either directly depends on biodiversity for their core business or that contribute to the conservation of biodiversity through their activities. The commercial wildlife and the bioprospecting industries of South Africa provide cornerstones for the biodiversity economy and are the focus of this strategy.

Both the wildlife and bioprospecting sub-sectors of the biodiversity economy have already demonstrated the potential for significant future development and growth. In the study commissioned on the situational analysis of the biodiversity economy, the contribution of the biodiversity economy to the national economy can be measured in terms of Gross Domestic Product (GDP), with the wildlife and bioprospecting industries contributing R3 billion to GDP in 2013. Growth in the wildlife and bioprospecting industries can make a significant impact on the national economy while contributing to national imperatives such as job creation, rural development, and conservation of our natural resources.

The Wildlife Industry value chain is centered on game and wildlife farming/ranching activities that relate to the stocking, trading, breeding, and hunting of game, and all the services and goods required to support this value chain. The key drivers of this value chain include domestic hunters, international hunters, and growing retail market demand for wildlife products such as game meat and taxidermy products. This sector is therefore characterised by an interesting combination of agriculture, eco-tourism, and conservation characteristics.

Over the period 2008-2013, the total Wildlife Industry market grew by more than 14% per year. This growth comprised an average annual growth exceeding 6% in domestic hunting, a decrease in international

hunting, and an exponential growth in live auction sales. It is considered likely that the consolidated Wildlife Industry has the potential to experience a weighted average annual growth rate of between 4 % and -14 % per year up to 2030.

For the wildlife and bioprospecting sub-sectors of the biodiversity economy to achieve their full potential, a strategic partnership between the state, private sector, and communities is required. To this end, a National Biodiversity Economy Strategy (NBES) is required to guide the sustainable growth of the wildlife and bioprospecting industries and to provide a basis for addressing constraints to growth, ensuring sustainability, identifying clear stakeholder's responsibilities, and monitoring the progress of the Enabling Actions.

The Vision of NBES is to optimise the total economic benefits of the wildlife and bioprospecting industries through its sustainable use, in line with the Vision of the Department of Environmental Affairs. The purpose of NBES is to provide 14-year national coordination, leadership, and guidance to the development and growth of the biodiversity economy.

NBES has set an industry growth goal stating that by 2030, the South African biodiversity economy will achieve an average annualised GDP growth rate of 10% per annum. This envisioned growth curve extends into the year 2030 and is aligned with the efforts of the country's National Development Plan, Vision 2030. The NBES seeks to contribute to the transformation of the biodiversity economy in South Africa through inclusive economic opportunities, reflected by a sector that is equitable - equitable access to resources, equitable and fair processes and procedures, and equitable distribution of resources (i.e., business, human, financial, indigenous species, land, water) in the market.

To address these transformation NBES imperatives, NBES has the following principles:

- Conservation of biodiversity and ecological infrastructure
- Sustainable use of indigenous resources
- Fair and equitable beneficiation
- Socio-economic sustainability
- Incentive driven compliance with regulation
- Ethical practices
- Improving quality and standards of products.

The NBES provides the opportunity to redistribute South Africa's indigenous biological/ genetic resources equitably , across various income categories and settlement areas of the country. The NBES has prioritised nodes in the country for biodiversity economy transformation, referred to as BET nodes. NBES prioritises 18 BET nodes, 13 rural and 5 urban districts across the nine provinces of the country, with communities having been prioritised for the development of small and medium-size enterprises and community-based initiatives which sustainably use indigenous biological and/or genetic resources. The municipality within which the project is proposed is not included as one of these nodes.

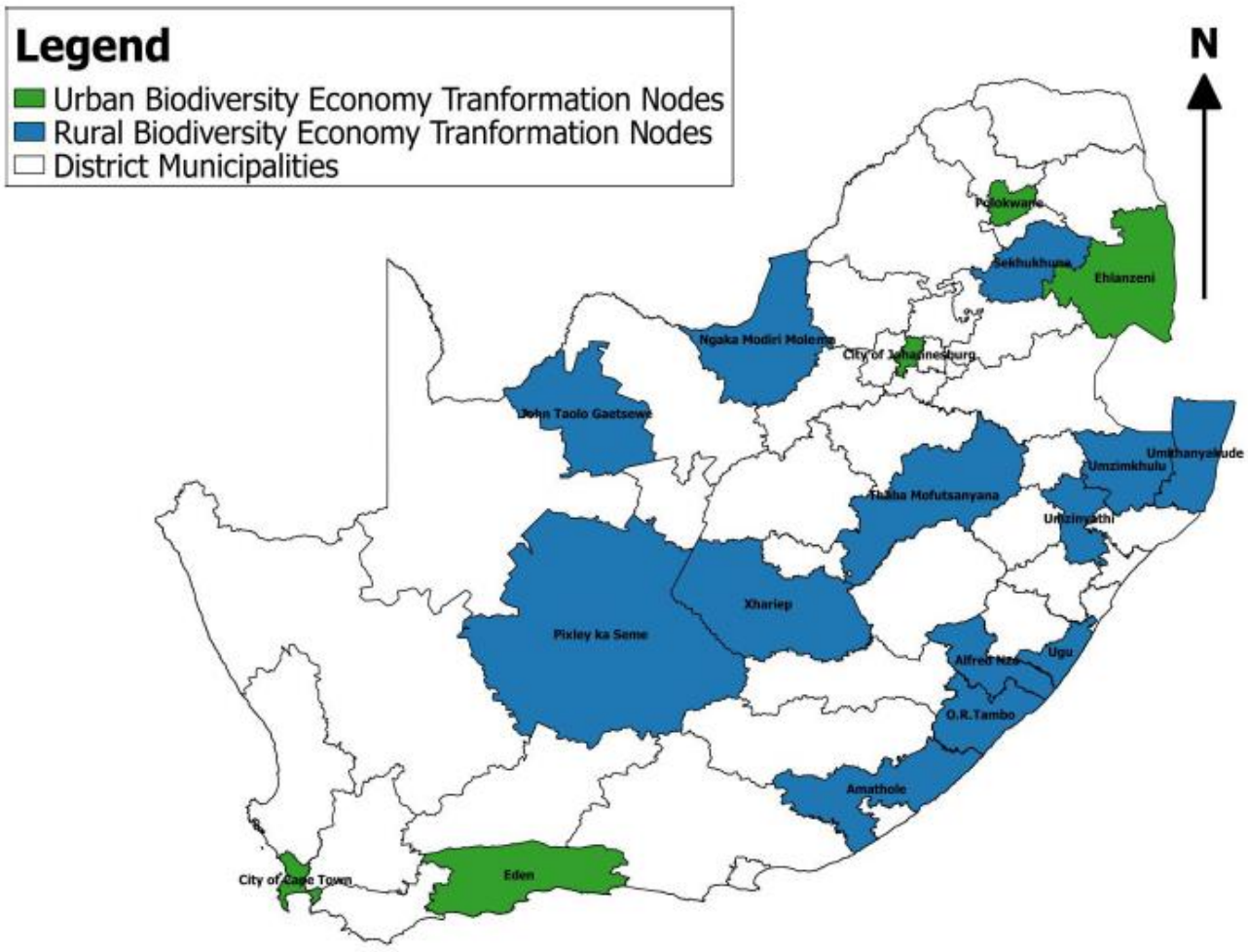


Figure 3.4: Map of the Biodiversity Economy Transformation (BET) nodes which are the transformation priorities of the NBES

3.5 Provincial Planning and Context

3.5.1 Western Cape Provincial Spatial Development Framework (PSDF) 2014

The Western Cape Government (WCG) and the City of Cape Town (CCT) mandated the Economic Development Partnership (EDP) to "scope a long-term economic vision and plan involving all key Western Cape economic leaders as well as citizens for the next 30 to 40 years." This Provincial initiative, referred to as OneCape 2040, complements the National Development Plan and builds on the WCG's Provincial Strategic Objectives (PSOs) which sets the goal of achieving sustainability through sustainable, low-carbon resource use.

The Western Cape Draft Strategic Plan (2009 – 2014) outlines the 12 Provincial Strategic Objectives (PSOs) of the Western Cape Government. Structures have been established for the PSOs to ensure a system of transversal working across the province. Climate change has been identified as a priority focus area and PSO7 (Mainstreaming Sustainability and Optimising Resource-Use Efficiency) comprises a number of working groups that relate to climate change:

- Energy Work Group – to ensure sustainable energy systems and move towards a low carbon economy in the Western Cape;
- Climate Change Adaptation Work Group – to reduce vulnerability and increase coping capacity to climate risk within the communities, economy, and ecosystems of the Western Cape;
- The Sustainable Resource Management Work Group – to implement programmes and projects towards managing our natural resources sustainably, without compromising ecosystem integrity
- The Land-Use Planning Work Group – to ensure coordinated and integrated land use planning throughout the province.

In addition, the Green Economy Work Group, which sits under PSO1 (Increasing Opportunities for Growth and Jobs), is focused on promoting the Green Economy in the Western Cape, of which climate change-related objectives and projects are a significant focus. PSO11 (Creating Opportunities for Growth and Development in Rural Areas) deals with the development of the rural economy with clear links to climate change through the agriculture sector activities.

3.5.2 Green is Smart- The Western Cape Climate Change Response Strategy

Green is Smart' sets out an agenda for how the Western Cape can become a global pioneer in the green economy and the leading green economic hub of the African continent. It is a framework for shifting the Western Cape economy from its current carbon-intensive and resource wasteful path with high levels of poverty to one that is smarter, greener, more competitive and
more equal and inclusive.

Five drivers for the transition are identified (smart mobility, smart living & working, smart ecosystems, smart agri-processing, smart enterprise), along with five enablers (finance, rules & regulations, knowledge management, capabilities, infrastructure) that are needed to create the environment for the proposed new economic growth path. The strategic framework presents stakeholders with an opportunity to create a region with a sustainable future and the potential for consistent economic growth. There are also opportunities to use this growth to address the Western Cape's social exclusion and unemployment challenges. Such an economy is set to attract investment and retain people looking to visit, invest, work, live and study in the Western Cape. Importantly, the framework identifies priorities that would position the Western Cape as a pioneer and early adopter of green economic activity.

Climate Change is a key driver of the green economy and the priority activities in the Green Economy Strategy Framework support the implementation of the Climate Change Response Strategy and vice versa. The alignment between the two documents is important in addressing climate change responses and promoting the green economy.

The key concepts related to the space economy policies of the PSDF are illustrated in Figure 3.5. In summary, these are to prioritise the roll-out of the 'greener' economy and promote rural economic diversification using off-grid infrastructure technologies, and support land reform and integrated rural development.

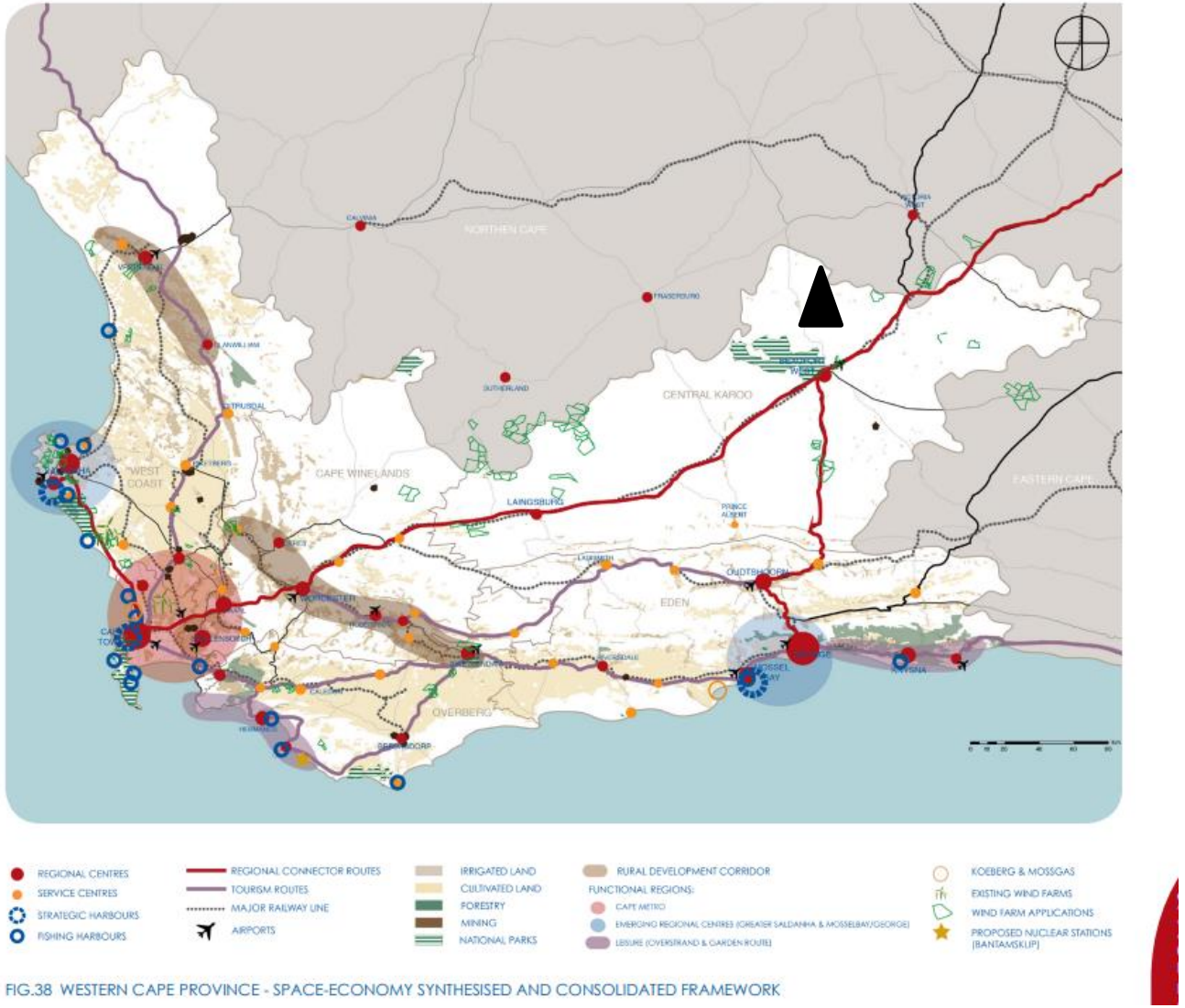


Figure 3.5: Development regions and corridors of the Western Cape (Source: Western Cape PSDF 2014). The position of the Poortjie Wes Cluster Grid site is indicated by the black triangle

Although the proposed project site is not located in any specific area identified for development, the development of Poortjie Wes Cluster Grid will assist in achieving (although only to a limited extent) the promotion of the provincial green economy of the Western Cape.

3.5.3. The Provincial Strategic Plan 2019-2024

With the growing sense of urgency around climate change, resilience must be built into all aspects of our society and economy. In the Western Cape, climate change is already causing profound changes. The frequency and severity of weather-related disasters continue to increase (particularly fire, drought, and floods). Average temperatures continue to increase and there will be longer gaps between rainfall, which will be increasingly intense. As a coastal province, we are vulnerable to sea-level rise and ocean warming, and acidification. These impacts have knock-on effects on our economy, infrastructure, and social well-being.

The impact is already being experienced. The ongoing drought has cost over R14 billion in the agricultural sector alone, and the 2017 Garden Route fires and storms cost R4 to 6 billion.14 Energy- and carbon-intensive industries are highly exposed to local and global carbon pricing policies, and they are likely to face higher costs and a decline in outputs and exports.

By taking a proactive approach and investing strategically, the Western Cape can take advantage of the global responses to climate change. The increasing adoption of carbon pricing will drive demand for renewable energy, a sector that the Western Cape leads nationally. The positive uptake within the agricultural sector of climate resilience strategies such as conservation agriculture can improve our competitive advantage in export markets. Supporting municipalities and the agricultural sector around water augmentation, diversification, conservation, and demand management programmes and supporting businesses around improved water efficiencies and own augmentation are key to ensuring water security. Anticipating the shifts to a green economy and low carbon technologies means we can adapt our labour force to the changing skills needs. This is a core focus of the resource and infrastructure resilience levers within the Growth and Jobs VIP and Mobility and Spatial Transformation VIP, with interventions targeting energy and water security, waste management, the waste economy, and infrastructure at a provincial department and municipal level. Food Security Most households in the province are dependent on cash.

3.5.4. The Western Cape Climate Change Response Strategy (2014)

The Western Cape Government (WCG) recognises the urgency with which we all need to act locally – in a transversal, bold and pioneering manner and at an unprecedented scale - to reduce our collective Greenhouse Gas (GHG) emissions and adapt to global climate change. In contributing to global and national efforts to mitigate climate change and build resilience, the WCG proposes leading a collective strategic approach for the Western Cape and its people, which will reduce our carbon contribution and dependency, whilst enabling locally effective adaptation action to address the impacts of unavoidable climate change occurring now, and in future. Building on the 2008 Western Cape Climate Change Response Strategy and Action Plan, the updated Strategy is newly aligned with the National Climate Change Response Policy and geared to strategically direct and mainstream climate change actions and related issues throughout relevant Provincial transversal agendas. In line with the National Climate Change Response Policy, the Strategy takes a two-pronged approach to address climate change:

- Mitigation: Contribute to national and global efforts to significantly reduce GHG emissions and build a sustainable low carbon economy, which simultaneously addresses the need for economic growth, job creation, and improving socio-economic conditions;
- Adaptation: Reduce climate vulnerability and develop the adaptive capacity of the Western Cape's economy, its people, its ecosystems, and its critical infrastructure in a manner that simultaneously addresses the province's socio-economic and environmental goals. The Strategy is a coordinated climate change response for the Western Cape Province and will guide the collective implementation of innovative projects as well as the search for opportunities that combine a low carbon development trajectory with increased climate resilience, enhancement of ecosystems, and the services they provide, as well as economic growth and job creation.

The development of the Poortjie Wes Cluster Grid will assist in achieving the promotion of the provincial green economy of the Western Cape indirectly and as required associated infrastructure, albeit only to a limited extent.

3.5.5 Western Cape Sustainable Energy Strategy (2007)

The blackouts experienced in the Western Cape during 2005 and 2006 have highlighted the importance of sustainable energy supplies to the successful socio-economic development of the region. To ensure that the crucial issues of energy and economic development, climate change, human capital development, and regional investment priorities are effectively addressed, the Department of Environmental Affairs and Development Planning is launching this Sustainable Energy Strategy and Programme of Action. The initiative forms a vital cornerstone in sustainable development policy for the Western Cape. As has recently been so clearly demonstrated, energy security plays a crucial role in ensuring that the province can meet its economic, social, and environmental objectives and that it remains an attractive destination for investment. A sound energy strategy programme is essential in addressing environmental concerns, including climate change. The need to secure sources of cleaner, non-polluting, and renewable energy as part of our future development plans has become an important consideration and this strategy addresses the challenges of developing a clean energy industry in the Province. This strategy and programme is being developed and refined in partnership with key stakeholders in the Province and will continue to evolve to ensure its relevance to ensuring energy security and sustainable development. Working within the parameters set by the national government, and considering the various initiatives at the local government level across the Province, the strategy and programme seek to:

- support economic and social development poverty alleviation and infrastructure development;
- address environmental issues such as air quality, energy conservation, and climate change;
- foster the development of a clean energy sector; and
- support and enhance provincial investment programmes effectively.

Considering the goal to promote renewable energy production and the associated manufacturing industry in the province, the development of the Poortjie Wes Cluster Grid is considered to contribute to the goals, albeit to a limited extent and indirectly.

3.5.6. Western Cape Biodiversity Spatial Plan (Cape Nature, 2017)

The Western Cape Biodiversity Spatial Plan (WCBSP) is a spatial tool that comprises the Biodiversity Spatial Plan Map (BSP Map) of biodiversity priority areas, accompanied by contextual information and land use guidelines that make the most recent and best quality biodiversity information available for land use and development planning, environmental assessment and regulation, and natural resource management. The BSP Map covers both the terrestrial and freshwater realms, as well as major coastal and estuarine habitats. Developed at a relatively fine spatial scale, the BSP can be used for planning at local, district, and provincial levels; and

» Hydrological Context
  * South African Inventory of Inland Aquatic Ecosystems (SAIIAE) (Van Deventer *et al*., 2018) – A South African Inventory of Inland Aquatic Ecosystems (SAIIAE) was established during the National Biodiversity Assessment of 2018. It is a collection of data layers that represent the extent of the river and inland wetland ecosystem types as well as pressures on these systems.
  * National Freshwater Ecosystem Priority Area (NFEPA) (Nel *et al*., 2011) – The NFEPA database provides strategic spatial priorities for conserving the country's freshwater ecosystems and associated biodiversity as well as supporting sustainable use of water resources.

Table 3.2: Terrestrial Critical biodiversity Areas and Biodiversity Land Management Classes as described by the Western Biodiversity Spatial Plan

CBA Map Category	Desired State	Land management objective
Protected Areas	Natural	Protected Areas are managed through Protected Area Management Plans and are therefore not managed through the Western cape Spatial Biodiversity Plan.
Critical Biodiversity Area 1	Natural	Maintain in a natural state (or near-natural state if this is the current condition of the site) that secures the retention of biodiversity pattern and ecological processes. For areas classified as CBA1, the following objectives must apply: » Ecosystem and species must remain intact and undisturbed; » Since these areas demonstrate high irreplaceability, if disturbed or lost, biodiversity targets will not be met; » Important: these biodiversity features are at, or beyond, their limits of acceptable change. If land use activities are unavoidable in these areas and depending on the expert opinion of the condition of the site, a Biodiversity Offset must be designed and implemented
Critical Biodiversity Area 2	Natural	Maintain in natural (or near-natural state if this is the current condition of the site) that secures the retention of biodiversity pattern and ecological processes. For areas classified as CBA2, the following objectives must apply: » Ecosystem and species must remain intact and undisturbed; » There is some flexibility in the landscape to achieve biodiversity targets in these areas. It must be noted that the loss of a CBA2 area may elevate other CBA 2 areas to a CBA 1 category.

CBA Map Category	Desired State	Land management objective
		» These biodiversity features are at risk of reaching their limits of acceptable change. If land use activities are unavoidable in these areas and depending on the condition of the site, set-aside areas must be designed in the layout and implemented. If site-specific data confirms that biodiversity is significant, unique and/or highly threatened or that a Critically Endangered or Endangered species is present, Biodiversity Offsets must be implemented.
Ecological Support Area 1	Functional	Maintain ecological function within the localised and broader landscape. A functional state in this context means that the area must be maintained in a semi-natural state such that ecological function and ecosystem services are maintained. For areas classified as ESA1, the following objectives apply: » These areas are not required to meet biodiversity targets, but they still perform essential roles in terms of connectivity, ecosystem service delivery, and climate change resilience. » These systems may vary in condition and maintaining function is the main objective, therefore: * Ecosystems still in natural, near natural state should be maintained. * Ecosystems that are moderately disturbed/degraded should be restored
Ecological Support Area 2	Functional	Maintain current land use with no intensification for areas classified as ESA2, the following objectives apply: » These areas have already been subjected to severe and/or irreversible modification » These areas are not required to meet biodiversity targets, but they may still perform some function with respect to connectivity, ecosystem service delivery, and climate change resilience » Objective is to maintain remaining function, therefore: * Areas should not undergo any further deterioration in ecological function. * Opportunities to change land use practices to improve ecological function (i.e., cultivation agriculture to livestock grazing agriculture) are desirable in ESA2 areas.
Other Natural Areas and No Natural Habitat Remaining	Production	No desired state or management objective is provided for Other Natural Areas (ONA) or Natural Resource Research (NNR).

The WCSDP states the following regarding the development of renewable energy facilities:

» *Installations to be located on transformed, disturbed, or low-value agricultural land, where possible.*

» *Infrastructure installations requiring a location outside the urban edge is restricted to extensive agricultural areas peripheral to settlements in*

- *proximity to regional routes to facilitate access and restrict fragmentation of the agricultural landscape.*
  - *Installations in intensive agricultural areas are restricted to essential services (e.g., irrigation infrastructure, safety, and security).*
  - *Energy generating developments (i.e., nuclear power, wind farms, etc.) are associated with large areas of land left undeveloped thereby*
- *maintaining low transformation levels relative to the property size.*
  - *Avoidance of sensitive areas such as flood lines, river and wetland buffers and special habitats.*
  - *All water-use developments should be subject to the Ecological Reserve in terms of the National Water Act*

3.5.7. Western Cape Climate Change Response Strategy (2014)

Renewable energy is a key area of focus for the Western Cape and forms a fundamental component of the drive towards the Western Cape becoming the green economy hub for Africa. The renewable energy sector in the Western Cape covers large scale wind and solar PV facilities as well as smaller scale, off-grid systems that are becoming more established. The WCG has a role to play in supporting the development of the renewable energy industry through promoting the placement of renewable energy facilities in strategic areas of the Western Cape as well as through supporting renewable energy industries.

Waste-to-energy opportunities in the Western Cape are being further investigated to facilitate large-scale rollout. This includes understanding the most appropriate technologies for waste-to-energy projects as well as developing decision support tools for municipalities to implement waste-to-energy programmes.

Priority areas:

- Development of the Renewable Energy economy in the Western Cape, in terms of both the appropriate placement of renewable energy as well as manufacturing opportunities;
- Development of waste-to-energy opportunities for both the municipal and the private (commercial and industrial) waste systems;
- Development of opportunities around small-scale renewable energy embedded generation activities.

3.6 Local Policy and Planning Context

The development of the Poortjie Wes Cluster Grid, as required associated infrastructure for six renewable energy facilities, contributes to the strategy as it is in line with some of the mitigation measures that have been developed to reduce GHG emissions.

The local tiers of government within which Poortjie Wes Cluster Grid is located in the Beaufort West Local Municipality within the Great Karoo District Municipality. The development instruments or policies at both the district and local levels contain objectives that are in line with the development of the Poortjie Wes Cluster Grid. These include economic growth, job creation, community upliftment, and poverty alleviation.

Table 3.1: Relevant district and local legislation and policies for Poortjie Wes Cluster Grid

Relevant policy	Relevance to Poortjie Wes Cluster Grid
Central Karoo District Municipality Integrated Development Plan (IDP), (2017-2022)	The 2017 – 2022 Central Karoo IDP has the following vision for the Central Karoo: Working together in Development and Growth. It is proposed that the spatial vision also includes the need for resilience, and therefore the spatial vision is proposed to be: "Working together in Sustainable Spatial Development and Growth towards a Resilient Central Karoo" In support of realising the above vision, the SDF unpacks it by focusing on the following three spatial strategies and one underpinning governance strategy, which also informs the spatial concept: » Strategy A: A region that protects the environment, enhances resilience, capitalises on, and honour's the Karoo charm in support of a vibrant people and economy. » Strategy B: Improve regional and rural accessibility and mobility for people and goods in support of a resilient economy. » Strategy C: Allocate government resources, infrastructure, and facilities in a manner that uplifts and skills people and focuses on maximising impact on the most possible people, while providing a basic level of service for all. » Strategy D: Partnership-driven governance and administration towards improved financial and non-financial sustainability and resilience. The purpose of chapter 4 of the CKIDP is to provide the overarching spatial vision for the Central Karoo, determine the future growth needs, frame the spatial concept, and then set out the spatial policies for the Central Karoo. Strategy A of Chapter 4 sets out the initiative for the Central Karoo to be a region that protects the environment, enhances resilience, and capitalises and honours the Karoo charm in support of a vibrant people and growing the economy. The following policies will be supported through the proposed development » Policy A1: protect critical biodiversity areas, environmental support areas & natural environment towards a resilient central karoo » Policy A5: support and promote the renewable energy economy » Policy A8: central karoo climate change adaptation and mitigation policy The strategic objective of supporting and guiding the development of a diversified, resilient, and sustainable district economy, and the development objectives of creating investment opportunities in sectoral development (i.e. investment activities, Entrepreneurial business support programme), and enabling an environment for business establishment and support initiatives (i.e., Increase the number of businesses, entrepreneurial support) through its local content and local economic development requirements as prescribed under the REIPPP Programme will be supported through the proposed development.
Beaufort West Local Municipality Draft Integrated Development Plan for 2022/2027	The following sector plans should be drafted or reviewed before the tabling and adoption of the 2022-2027 five-year IDP. The development priorities, recommendations, and critical challenges identified in sector plans must be incorporated into the five-year IDP. Issues relating to energy and electricity have been identified and include the need to develop a renewable energy plan for the Local Municipality. The local municipality confirms that it engages in the national programme for the development of renewable energy facilities in response to global climate change mitigation. Furthermore, several renewable energy projects are proposed in the Greater Karoo District Municipality and it is

Relevant policy	Relevance to Poortjie Wes Cluster Grid
	considered that the sector must be exploited to ensure the creation of new job opportunities for local people.
Beaufort West Spatial Development Framework (2015)	The Beaufort West Municipality Spatial Development Framework (SDF) was found to be most relevant with respect to specific planning guidance near Beaufort West town. It was completed in 2015 and builds on the 2013 Urban Restructuring Framework. Climate change will be incorporated in the responses of the Municipality's planning and service delivery so that climate change can be effectively addressed. Climate change must be integrated into existing policies and plans in response to climate change. Supporting sector plans and particularly the SDF, must all include climate change considerations for all sectors to ensure that trade-offs and synergies are understood and met with available science and robust analysis.

CHAPTER 4: NEED AND DESIRABILITY

One of the objectives of the EIA process 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 development footprint*". The need and desirability of a development need to consider whether it is the right time and right place for locating the type of land use/activity being proposed. Need and desirability is therefore equated to the wise use of land and should be able to answer the question of what the most sustainable use of land is.

This chapter describes the need and desirability of the Poortjie Wes Cluster Grid at the project site considered reasonable and feasible by the project Applicant. Although the Poortjie Wes Cluster Grid is being assessed as part of a stand-alone BA process, the proposed infrastructure is directly linked to the operation of six renewable energy facilities (Solar PV) and is essential infrastructure for the operation of these facilities to enable the electricity evacuation to the national grid. In the absence of the proposed Poortjie Wes Cluster Grid, the six renewable energy facilities will not be able to operate. Therefore, considering the dependency of the proposed renewable energy facilities on the proposed grid connection infrastructure, the need and desirability of the Poortjie Wes Cluster Grid is directly linked to the need and desirability of the proposed renewable energy facilities that it will cater for.

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 the EIA Regulations, 2014 - Appendix 1: Content of Basic Assessment Reports:

Requirement	Relevant Section
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 Poortjie Wes Cluster Grid is included and discussed as a whole within this chapter. The need and desirability for the development has been considered from an international, national, regional, and site-specific perspective.

4.2 Need from an International Perspective

The need and desirability of the Poortjie Wes Cluster Grid (and the six renewable energy facilities it will cater to), from an international perspective, can be described through the project's alignment with internationally recognised and adopted agreements, protocols, and conventions. South Africa is a signatory to several international treaties and initiatives, including the United Nation's Development Programme's (UNDP's) Sustainable Development Goals (SDGs). The SDGs address social and economic development issues such as poverty, hunger, health, education, climate change, gender equality, water, sanitation, energy, urbanization, environment, and social justice. The SDGs comprise 17 global goals set by the United Nations. The 17 SDGs are characterised by 169 targets and 304 indicators.

Goal 7 of the SGDs relates to "Affordable and Clean Energy", with the aim of the goal being to ensure access to affordable, reliable, sustainable, and modern energy for all. The following targets and indicators have been set for Goal 7:

Targets		Indicators	
7.1	By 2030, ensure universal access to affordable, reliable, and modern energy services.	7.1.1 7.1.2	Proportion of population with access to electricity. Proportion of population with primary reliance on clean fuels and technology.
7.2	By 2030, increase substantially the share of renewable energy in the global energy mix.	7.2.1	Renewable energy share in the total final energy consumption.
7.3	By 2030, double the global rate of improvement in energy efficiency.	7.3.1	Energy intensity measured in terms of primary energy and GDP.
7.A	By 2030, enhance international cooperation to facilitate access to clean energy research and technology, including renewable energy, energy efficiency, and advanced and cleaner fossil-fuel technology, and promote investment in energy infrastructure and clean energy technology.	7.A.1	Mobilised amount of United States dollars per year starting in 2020 accountable towards the $100 billion commitment.
7.B	By 2030, expand infrastructure and upgrade technology for supplying modern and sustainable energy services for all in developing countries, in particular least developed countries, small island developing States, and land-locked developing countries, in accordance with their respective programmes of support.	7.B.1	Investments in energy efficiency as a percentage of GDP and the amount of foreign direct investment in financial transfer for infrastructure and technology to sustainable development services.

The development of the Poortjie Wes Cluster Grid would connect 6 renewable energy facilities to the electricity grid (a total of 710MW), which would contribute positively towards achieving Goal 7 (and specifically 7.2.1) of the SGDs through the following means:

- By generating affordable and clean energy.
  - A study published by the CSIR on 14 October 2016 ("Cost of new power generators in South Africa Comparative analysis based on recent IPP announcements", Dr. Tobias Bischof-Niemz and Ruan Fourie), which took into consideration the results of the cost prices bid successfully under the DoE's REIPPP and Coal Baseload IPP Procurement (CBIPPP) Programmes, found that wind and solar PV were 40% cheaper than new baseload coal (i.e. R0.62/kWh for wind and PV vs R1.03 for coal).
  - Wind power technology is one of the cleanest electricity generation technologies, as it is not a consumptive technology and does not result in the release of emissions during its operation.
- By contributing towards South Africa's total generation capacity, specifically through the utilisation of renewable energy resources.

The Kyoto Protocol (1997) is also relevant to the need for the development of the 400KV MTS and power lines from an international perspective. The protocol calls for the reduction of South Africa's greenhouse gas emissions through actively cutting down on using fossil fuels, or by utilising more renewable resources. The development of the Poortjie Wes Cluster Grid will enable the connection of additional capacity from renewable energy projects

to be connected to the electricity grid and strengthen the commitment and action plan of the country to achieve the requirements, as set out in the protocol, through the generation of energy without the emission of greenhouse gasses.

4.3 Need from a National Perspective

The National Development Plan (NDP) envisages that, by 2030, South Africa will have an energy sector that provides reliable and efficient energy service at competitive rates; that is socially equitable through expanded access to energy at affordable tariffs, and that is environmentally sustainable through reduced emissions and pollution. Historically, coal has provided the primary fuel resource for baseload electricity generation in South Africa. Consequently, Eskom, which is the main electricity generating company in the country, generates approximately 85% of the country's electricity from coal resources (Stats SA, 2016), resulting in a large carbon footprint. Taking into consideration the need to ensure an adequate supply of electricity and meet international obligations in terms of addressing climate change, the Government has identified the need to diversify the energy mix within the country.

The Poortjie Wes Cluster Grid (and the six renewable energy facilities it will cater to) are proposed in specific response to the identified energy mix of the Country as per the requirements set out in the IRP with regards to renewable energy targets. As a result, the need and desirability of the project from a national perspective can largely be assimilated from the project's alignment with national government policies, plans, and programmes that have relevance to energy planning and production (as discussed in detail in Chapter 3). The following key policies have been developed by Government to consider South Africa's current energy production and projected future demands, and provide the necessary framework within which energy generation projects (and their supporting grid connection infrastructure) can be developed:

» Integrated Energy Plan (IEP); and
» Integrated Resource Plan (IRP).

The above-mentioned policies have been extensively researched and are updated on an ongoing basis to take into consideration changing scenarios, new information, and developments in new technologies, and to reflect updated demands and requirements for energy production within the South African context. These plans form the basis of South Africa's energy generation sector and dictate national priorities for energy production.

The IEP is intended to provide a roadmap of South Africa's future energy landscape which guides future energy infrastructure investments and policy development. South Africa has good wind and solar resources for the development and generation of wind and solar energy. In terms of electricity generation, the IEP states that South Africa should continue to pursue a diversified energy mix that reduces reliance on a single or a few primary energy sources.

The IRP for Electricity 2010 – 2030 (gazetted in 2019) is a subset of the IEP and constitutes South Africa's current gazetted energy plan. The purpose of the plan is to ensure sustainable electricity development which takes into consideration technical, economic, and social constraints and identifies investments in the electricity sector which are required to meet the country's forecasted electricity demands at minimum costs. This plan provides

for the development of 17 743MW of capacity from large-scale wind energy facilities by 2030 and the development of 6 000MW from large-scale solar energy facilities being allocated by 2030.

In addition to the policy considerations detailed above, Government has prioritised post-COVID-19 turnaround plans in terms of renewable energies within the Just Energy Transition (JET), coupled with key development objectives of the various spheres of government. These policies share the same ideals, such as:

» The utilisation, application, and investment in renewable energy resources in South Africa is considered to be an essential means of reducing the carbon footprint of the country,
» Diversifying the national economy,
» Reducing poverty, and
» Providing critical additional energy to Eskom's.

The government has compiled an Economic Reconstruction and Recovery Plan which was presented to Parliament in October 2020. According to this plan, the economic survey will rely on a massive investment in infrastructure, including energy, telecommunications, ports, and rail. The core elements of the Economic Reconstruction and Recovery Plan are as follows:

1. Priority interventions for economic recovery: the plan sets out eight priority interventions that will ignite South Africa's recovery and reconstruction effort. These are the flagship initiatives that all of society will rally around to build a new economy (**Figure 4.1**).

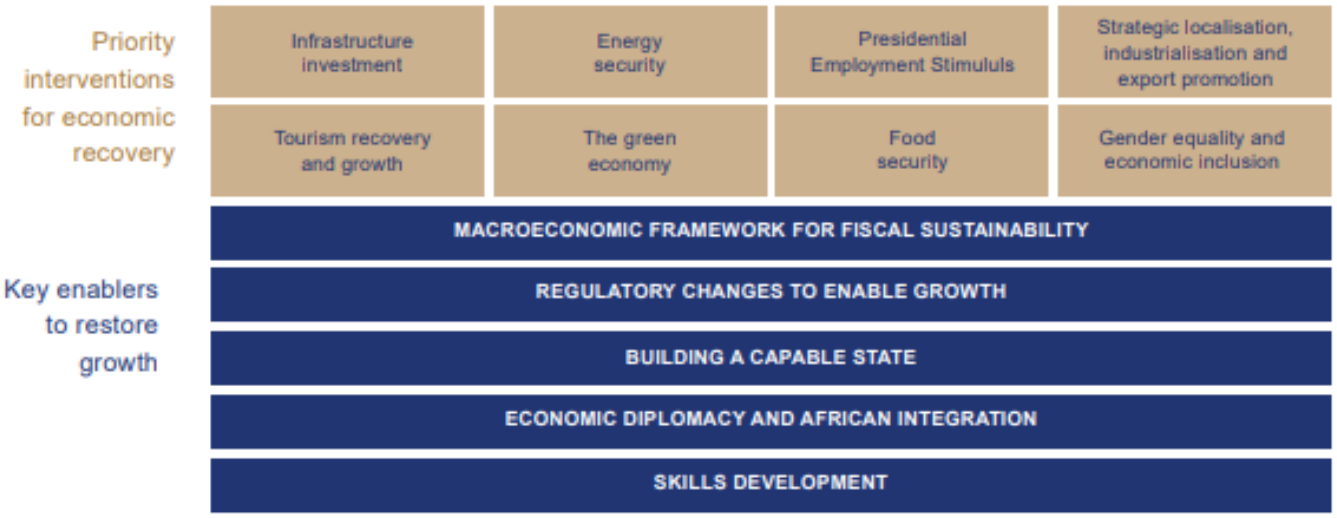


Figure 4.1: Core elements of the Economic Reconstruction and Recovery Plan (source: Building a new economy - Highlights of the Reconstruction and Recovery Plan, Presidency of the Republic of South Africa)

2. Enabling conditions for growth: these are growth-enhancing reforms and other preconditions for an inclusive, competitive, and growing economy.
3. Macroeconomic framework: economic reconstruction and recovery require careful mobilisation of resources to ensure fiscal sustainability.
4. Institutional arrangements: the plan focuses on execution and is supported by enhanced institutional arrangements to ensure implementation and accountability.

The plan recognises energy security as the most important prerequisite for the recovery agenda. One of the key commitments of the plan is therefore to achieve a sufficient, secure, and reliable energy supply within two years by improving Eskom's performance and rapidly expanding generation capacity through a diverse energy mix. The development of the Poortjie Wes Cluster Grid is identified as associated and required infrastructure for renewable energy projects, which are considered to be a mechanism for securing additional power generation capacity for the national grid, reducing the reliance for electricity on Eskom. Without the development of the Poortjie Wes Cluster Grid evacuation of additional electricity generated from renewable energy resources by the six solar PV facilities proposed as part of the Poortjies Cluster will not be possible.

The six renewable energy facilities (and their associated BESS) which the Poortjie Wes Cluster Grid will cater to will ensure the optimisation of a supply of steady-state power supply, as well as play a significant role in the Just Energy Transition ("JET") by supplying low-cost energy to the national grid. At the same time, it will contribute to a JET fund to assist in transitioning jobs from the fossil fuel sector in the Western cape to renewable energy. The high-quality solar resource and scale of the portfolio may also play a possible role in contributing to the hydrogen economy in South Africa, with Europe as a possible export market.

The South African government has identified the green economy as one of 12 job drivers that could help contribute to creating 5 million additional jobs by 2020. The New Growth Path, in which the sectoral jobs targets are disaggregated, envisages that as many as 300 000 new direct jobs could be created in the areas of natural resource management and renewable energy construction (Department of Energy, 2019). Even though the project will not form part of the REIPPP programme, the Applicant will implement similar social and economic development strategies, including amongst others, job creation, local content, skills development, enterprise and supplier development, and socio-economic development, which will mainly be linked to the six renewable energy facilities that the Poortjie Wes Cluster Grid will cater for. In addition to the connection of electricity generated to the grid (supporting electricity generation and supply), the project will therefore also contribute positively towards the socio-economic development of a region, over and above job creation.

The need for new power generation from solar energy (including the associated grid connection infrastructure) has therefore been identified and assessed by Government at a national scale considering the national energy requirements as well as international commitments to address climate change under the Paris Agreement, and provision has been made for the inclusion of new renewable power generation capacity in South Africa's energy mix. The implementation of the Poortjie Wes Cluster Grid will enable positive contribution toward the identified national need, while simultaneously contributing to job creation and socio-economic development, which is identified as a need for the country within the National Development Plan. The renewable energy facilities will make use of renewable energy technology and would contribute positively towards reducing South Africa's GHG emissions and the Just Energy Transition of the country.

4.3.1 Benefits of Renewable Energy in the South African Environment

The generation of electricity from renewable energy resources offers a range of potential socio-economic and environmental benefits for South Africa. Although the proposed project is not a renewable energy facility, the development thereof will enable the generation of electricity from renewable energy resources and the

evacuation thereof, thereby enabling the benefits of renewable energy development. The following benefits are identified:

Increased energy security: Given that renewables can often be deployed in a short timeframe and in a decentralised manner close to consumers, they offer the opportunity for improving grid strength and supply quality in the short-term, while reducing expensive distribution losses. As a result of the power constraints in the first half of 2015, power generators, meant to be the "barely-ever-used" safety net for the system (diesel-fired gas turbines), were running at > 30% average load factor in the first half of 2015. Load shedding occurred for 82 days in the first half of 2015 (out of 181 days). Results of a CSIR Energy Centre study for the period January to June 2015 (CSIR, August 2015), concluded that the already implemented renewable projects (wind and solar) within the country avoided 203 hours of so-called 'unserved energy'. During these hours, the supply situation was so tight that some customers' energy supply would have had to be curtailed ('unserved') if it had not been for the renewables. The avoidance of unserved energy cumulated into the effect that during 15 days from January to June 2015, load shedding was avoided entirely, delayed, or a higher stage of load shedding was prevented due to the contribution of the wind and PV projects[11].

Resource-saving: It is estimated that the achievement of the targets in the Renewable Energy White Paper will result in water savings of approximately 16.5 million kilolitres per annum. As an already water-stressed nation, it is critical that South Africa engages in a variety of water conservation measures, particularly due to the detrimental effects of climate change on water availability. Renewable energy also translates into revenue savings, as fuel for renewable energy facilities is free compared to the continual purchase of fuel for conventional power stations. Results of a CSIR Energy Centre study for January to June 2015 (CSIR, August 2015) have quantified the contribution of renewable energy to the national power system and the economy over the first 6 months of 2015 compared to the 12 months of 2014:

2014 (12 months)	**2015 (6 months)**
R3.64 billion saving in diesel and coal fuel costs	R3.60 billion saving in diesel and coal fuel costs
120 hours of unserved energy avoided, saving at least an additional R1.67 billion for the economy	200 hours of unserved energy avoided, saving at least an additional R1.20 billion–R4.60 billion for the economy
Generated R0.8 billion more financial benefits than cost	Generated R4.0 billion more financial benefits than cost

The overview of the Independent Power Producers Procurement Report (March 2019) has indicated that water savings of 42.8 million kilolitres have been realised by the programme from inception until the end of March 2019, of which 3.4 million kilolitres is reported on in this 2019 reporting quarter.

Exploitation of our significant renewable energy resource: At present, valuable renewable resources, including biomass by-products, solar radiation, and wind power remain largely unexploited. The use of these energy flows will strengthen energy security through the development of a diverse energy portfolio in South Africa.

By the end of March 2019, the REIPPPP had made the following significant impacts in terms of energy supply:

* 6 422MW of electricity had been procured from 112 Renewable Energy Independent Power Producers (IPPs) in seven bid rounds.

[11] (http://ntww1.csir.co.za/plsql/ptl0002/PTL0002_PGE157_MEDIA_REL?MEDIA_RELEASE_NO=7526896)

- 3 976 MW of electricity generation capacity from 64 IPP projects has been connected to the national grid.
- 35 669 GWh of energy has been generated by renewable energy sources procured under the REIPPPP since the first project became operational. Renewable energy IPPs have proved to be very reliable. Of the 64 projects that have reached COD, 62 projects have been operational for longer than a year. The energy generated over the past 12-month period for these 62 projects is 10 648 GWh, which is 96% of their annual energy contribution projections of 11 146 GWh over a 12-month delivery period. Twenty-eight (28) of the 62 projects (45%) have individually exceeded their projections.

Economics: As a result of the excellent resource and competitive procurement processes, both wind power and solar PV power are now proven in South Africa as cheaper forms of energy generation than coal power. They offer excellent value for money to the economy and citizens of South Africa while benefitting society as a whole through the development of clean energy.

The following has been achieved by the IPP programme (March 2019) in terms of investment and economics:

- Investment (equity and debt) to the value of R209.7 billion, of which R41.8 billion (20%) is foreign investment, was attracted.
- Socio-economic development contributions of R860.1 million to date, of which R81.1 million was spent in this 2019 reporting quarter.
- Enterprise development contributions of R276.7 million to date, of which R26.5 million was spent in this 2019 reporting quarter.

Pollution reduction: The release of by-products through the burning of fossil fuels for electricity generation has a particularly hazardous impact on human health and contributes to ecosystem degradation. The use of solar radiation or wind for power generation is a non-consumptive use of a natural resource that produces zero emissions during its operation.

The overview of the Independent Power Producers Procurement Report (March 2019) indicates that carbon emission reductions of 36.2 Mton CO_2 has been realised by the IPP programme from inception to date, of which 2.91 Mton is in this 2019 reporting quarter.

Climate-friendly development: The uptake of renewable energy offers the opportunity to address energy needs in an environmentally responsible manner and thereby allows South Africa to contribute towards mitigating climate change through the reduction of greenhouse gas (GHG) emissions. South Africa is estimated to be currently responsible for approximately 1% of global GHG emissions (and circa half of those for which Africa is responsible) and is currently ranked 9th worldwide in terms of per capita carbon dioxide emissions. The renewable energy sector saved South Africa 1.4 million tons of carbon emissions over the first 6 months of 2015[12].

Support for international agreements: The effective deployment of renewable energy provides a tangible means for South Africa to demonstrate its commitment to its international agreements under the Kyoto Protocol and the Paris Agreement, and for cementing its status as a leading player within the international community.

[12] http://www.iol.co.za/capetimes/renewable-energy-saving-sa-billions-csir-1.1903409#.VkNjdJq6FeU

Employment creation: The development, procurement, installation, maintenance, and management of renewable energy facilities have significant potential for job creation and skills development in South Africa. The construction phase will create temporary employment opportunities and the operation phase will create limited full-time employment opportunities.

The overview of the Independent Power Producers Procurement Report (March 2019) indicates that all IPP projects to date have created 40 134 job years for South African citizens.

Acceptability to society: Renewable energy offers several tangible benefits to society including reduced pollution concerns, improved human and ecosystem health, the use of clean energy, and climate friendly development.

Support to a new industry sector: The development of renewable energy offers the opportunity to establish a new industry within the South African economy, which will create jobs and skill local communities and result in community upliftment for the affected areas.

Protecting the natural foundations of life for future generations: Actions to reduce the disproportionate carbon footprint can play an important part in ensuring the human role in preventing dangerous anthropogenic climate change, thereby securing the natural foundations of life for generations to come; this is the basis of sustainable development.

4.4 Need from a Provincial Perspective

South Africa's electricity generation mix has historically been dominated by coal. This can be attributed to the fact that South Africa has abundant coal deposits, which are relatively shallow with thick seams, and are therefore easy and comparatively cost-effective to mine. In 2016, South Africa had a total generation capacity of 237 006GWh; approximately 85.7% (equivalent to 203 054GWh) of this figure was generated by coal, and only 0.9% (equivalent to 2 151GWh) was generated by solar (refer to **Figure 4.2**).

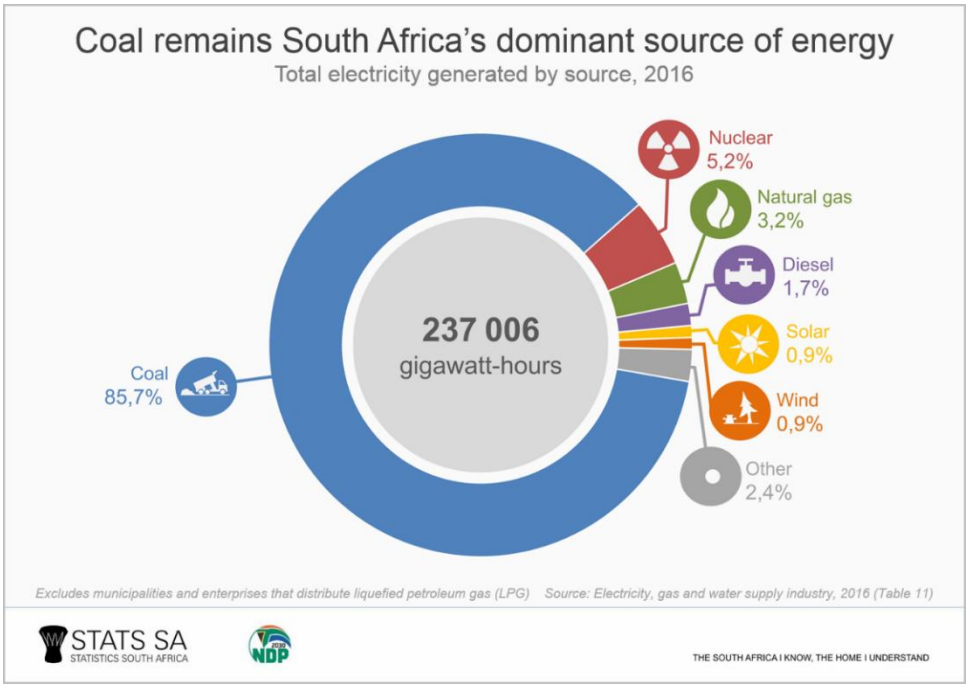


Figure 4.2: Overview of South Africa's electricity generation by source (source: StatsSA 2016 Electricity, gas, and water supply industry)

Whereas the majority of South Africa's electricity generation infrastructure is currently located within the Mpumalanga Province due to the location of coal resources within this province, the Western Cape Province has been identified as an area where the development of wind farms and solar energy facilities is a feasible and suitable option for electricity generation. The Beaufort West REDZ (REDZ 11) has been designated for the development of large-scale wind and solar developments (GNR142 of February 2021).

The Western Cape Provincial (2022-2027) Draft Development Plan indicates that sustainable development must be ensured in the province and that people-centered development and economic development is imperative to address the most significant challenge facing the Western Cape, i.e., material poverty and deprivation. The province also acknowledges climate and environmental challenges, the need to enhance environmental resilience and sustainability, the efficient use of scarce natural resources, the promotion of renewable sources of energy, and new jobs and income for the poor in terms of a green agenda.

The overall energy objective for the province also includes promoting the development of renewable energy supply schemes which are considered to be strategically important for increasing the economic opportunities for the affected communities, while also minimising the detrimental environmental impacts. The implementation of sustainable renewable energy is also to be promoted within the province through appropriate financial and fiscal instruments.

The Western Cape Province has also been identified as a major source of electricity in South Africa, with the largest number of operational wind energy facilities currently located within the province. The Western Cape is considered desirable for the development of commercial solar energy facilities from a technical perspective by the prevailing climatic conditions (as the economic viability of a solar energy facility is directly dependent on

the annual solar irradiation values for a particular area), relief and aspect, the availability of a direct grid connection (i.e. a point of connection to the national grid) and the availability of land on which the development can take place. The availability of existing grid infrastructure in the Central Corridor of the province makes for ease of access to connect the projects to the national grid and evacuate the generated electricity[13].

The need for the project is therefore supported from a planning and policy level at a Provincial level.

4.5 Need from a District and Local Perspective

It can be confirmed that from a regional perspective, there is a need and desirability for the development of renewable energy facilities (and their associated grid connection infrastructure) within the Western Cape and specifically the regional area. The need for the Poortjie Wes Cluster Grid is therefore confirmed based on the need for the evacuation of the generated renewable electricity to the national electricity grid, which will be enabled by the proposed infrastructure.

From a district level, the need for the development of the Poortjie Wes Cluster Grid (and the six renewable energy facilities that it will cater to) is reflected within the Central Karoo District Municipality and the Beaufort West Local Municipality planning documentation. The following planning policies refer to the need for the development of renewable energy facilities (which includes all required infrastructure for operation) within the municipal area:

* The Central Karoo District Municipality Final Integrated Development Plan for 2021/2022 has set its target for 2030 to move to less carbon-intensive electricity production through procuring at least 20 000MW of renewable energy, increased hydro-imports from the region, and increased demand-side measures, including solar water heating. Moreover, the Western Cape Government (WCG) is in the process of evaluating its readiness to respond to an increase in service delivery associated with potential large-scale, or regional, development proposals such as shale gas development (SGD), uranium-molybdenum mining, and renewable energy developments in the Central Karoo. There is concern that the concomitant increase in demand for services may outstrip the capacity of local, provincial, and national government to supply such services, should these potential developments come to fruition. This initiative ("the Readiness Initiative") sets out to identify the focal areas and associated actions that are likely to be required to (1) improve existing service delivery in the region and (2) increase the government's capacity to meet possible future service delivery demands.
* The Beaufort West Local Municipality Draft Integrated Development Plan Review (IDP), 2019-2020 indicates that the electricity sector is one of the fastest-growing sectors in the municipality and it is considered that the sector must be exploited to ensure the creation of new job opportunities for local people. Issues relating to energy and electricity have been identified and include electricity provision to all in need and the upgrading of electricity infrastructure. The municipality aims to Produce about 20 000 MW of renewable electricity by 2030, importing electricity from the region, decommissioning 11 000 MW of aging coal-fired power stations, and accelerated investments in demand-side savings, including technologies such as solar water heating.

Considering the requirements and need and desirability for the development of renewable energy facilities and the associated required infrastructure (i.e., the Poortjie Wes Cluster Grid) within the municipal area, it is

[13] https://www.businessinsider.co.za/trending/eastern-cape-primed-to-become-wind-power-hub-of-sa-this-map-shows-why-2020-11

considered that there is a definite need for developments of such a nature considering the development plans of the relevant local and district municipalities and the reliance of the affected areas on such developments.

4.6 Receptiveness and Desirability of the project site to develop the Poortjie Wes Cluster Grid

The feasibility of the project site, the substation development envelope, and the power line corridor for the development of the Poortjie Wes Cluster Grid also indicate the desirability of the development within the site-specific location. The section below describes the site-specific considerations that contribute to the desirability of the project within the identified project site.

The Poortjie Wes Cluster Grid is proposed to be constructed outside of the urban edge of the surrounding towns on privately-owned properties currently used mainly for agricultural practices. The affected farm portions have not been considered for an alternative land use such as urban development or mining, and therefore the proposed infrastructure does not conflict with the current land use of the project site (i.e., the affected properties). The site falls within the Central Corridor of the Strategic Transmission and within the Beaufort West REDZ, an area designated as a node for solar and wind energy projects.

The project site proposed for the development of the Poortjie Wes Cluster Grid plays characteristics that contribute to the overall desirability. These include:

Extent of the project site: The affected properties desirable for and available for the development cover an area of ~1 051ha. This area is sufficient to accommodate the proposed 400kV MTS, collector substation, and power lines proposed as part of the Poortjie Wes Cluster Grid, and is considered to be sufficient space for the development footprint to be designed and to consider the identified environmental sensitivities

Site access: Access to the project site is ample with the presence of existing roads mainly consisting of national and secondary roads. The main access point for the site will be obtained via MR587 which is an existing provincial gravel road. This section of MR587 is located between the railway crossing in Nelspoort in the west and Murraysburg in the east. It is envisioned that both labour and materials will be transported via this route. The proposed site access road is based on an existing gravel veld track. The condition of the road is not known, and upgrades (including the provision of drainage infrastructure) might be required along the site access road to ensure it can accommodate abnormal and heavy load vehicles. The proposed access point meets the requirements of horizontal shoulder sight distance to either side. It is, however, recommended that vertical sight distances be verified on site before construction.

Land availability: The majority of the land in the area under consideration is used for agricultural purposes, with only a few properties privately-owned and available for development. The properties affected by the project site are some of the few available privately-owned land parcels in the area suitable for development. The applicant has obtained the required landowner's consent from the affected landowners which confirms the availability of the project site for the development.

Topographical considerations and existing infrastructure: The site proposed for the Poortjie Wes Cluster Grid site is characterised by topography which has limited constraints that could have an effect on the construction requirements of the proposed infrastructure. The topography is favourable for the construction and maintenance

activities associated with the development. Most of the project area is characterised by a slope percentage between 0 and 10%, with some smaller patches within the project area characterised by a slope percentage ranging from 10 to 30%. This illustration indicates a non-uniform topography in a few scattered areas most of the area being characterised by a gentle slope. The DEM of the project area indicates an elevation of 991 to 1153 Metres Above Sea Level (MASL).

Current land use and character: The site proposed for the Poortjie Wes Cluster Grid is located in the Beaufort West Local Municipality in the Central Karoo District within the Western Cape Province. The project is located approximately 12 km south-east of the town of Nelspoort at the foot of the Nuweveld Mountains and the old N1 road. The project area is also 29 km south of the Three Sisters town. The surrounding land use includes game reserves and agricultural activities, predominantly comprising livestock production.

The development of renewable energy projects (and the associated required grid connection infrastructure) within this region provides an opportunity to relieve the area, to some extent, which has suffered severe socio-economic challenges in terms of unemployment and poverty, as well as challenges related to the drought conditions of the area. The development of the Poortjie Wes Cluster Grid (and the six renewable energy facilities that it will cater to) on the affected properties will introduce a new land use to these properties, which is considered a more productive land-use, especially considering the water resource constraints and drought experienced in the area.

Proximity to Towns with a Need for Socio-Economic Upliftment: The official unemployment rate in the Beaufort West Local Municipality in 2016 was 12.2%, while 44.1% were regarded as not economically active and 8.3% were discouraged work-seekers. The figures for Ward 2 in 2011 were 6.2% and 37.1% respectively. These figures are significantly lower than the official unemployment 2011 rates for the Western Cape Province (21.6%) and National (29.8%). These lower rates do not however reflect seasonal unemployment which represents a significant challenge in the agricultural sector in the area.

The 2020 Socio-economic profile of the Beaufort West Local Municipality prepared by the Provincial Government notes that the BWM (24.2%) had the highest unemployment area in the Central Karoo District Municipality (22%) in 2019. The rate was also higher than the provincial rate (19.4%). The report notes that the high unemployment rate is particularly concerning given that this estimate is based on the narrow definition of unemployment i.e. the percentage of people that can work, but unable to find employment. In turn, the broad definition generally refers to people that can work, but not actively seeking employment. The current unemployment rates are likely to be higher due to the impact of COVID-19 pandemic on the national, provincial, and local economies.

Considering the above, it is clear that a need for employment opportunities and skills development is present within the area, as well as the socio-economic benefits that will be associated with it. These benefits would include an increase in the standard of living for the local residents within the area, as well as overall financial and socio-economic upliftment.

Transportation of Material and Components: As material and components would need to be transported to the site during the construction phase of the grid, accessibility was a key factor in determining the technical viability of the project, particularly considering transportation costs (direct and indirect) and the impact of this on project

economics. The presence of national, provincial, and local district roads available for use is considered beneficial as access to the site is available during the construction and operation.

CHAPTER 5: APPROACH TO UNDERTAKING THE BASIC ASSESSMENT PROCESS

In terms of the EIA Regulations of December 2014 (as amended in April 2017) published in terms of the NEMA (Act No. 107 of 1998) as amended, the construction and operation of the Poortjie Wes Cluster Gridis a listed activity requiring environmental authorisation. In terms of GN R113 of February 2018, the application for environmental authorisation is required to be supported by a BA process based on the location of the project site within the Eastern Strategic Transmission Corridor.

The BA process aims at identifying and describing potential environmental issues associated with the development of the proposed infrastructure. In order to ensure that a comprehensive assessment is provided to the competent authority and I&APs regarding the impacts of the project, detailed independent specialist studies were undertaken as part of the BA process.

South Africa has been subject to the enforcement of Government Gazette 43096 which places the country in a national state of disaster limiting the movement of people to curb the spread of the COVID-19 virus. The status of national state of disaster was still relevant at the commencement of the BA process. Considering the limitations in place, a comprehensive consultation process was designed and implemented to cater for the undertaking of a full-scale, innovative public participation process which included I&APs, the competent authority, directly impacted landowners/occupiers, adjacent landowners/occupiers, relevant Organs of State departments, ward councillors and other key stakeholders, while remaining within the limits as stipulated by the National Government. This chapter serves to outline the process that was followed during the BA process.

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 the EIA Regulations, 2014 (as amended) - Appendix 1: Content of Basic Assessment Reports:

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 Poortjie Wes Cluster Grid have been included in section 5.2, Table 5.1. The specific project activity relating to the relevant triggered listed activity has also been included in Table 5.1.
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.	A public participation plan was prepared and approved by the DFFE (Appendix C9). The details of the public participation process undertaken have been included and described in section 5.3.2.
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 received from the commencement of the BA process will be included and responded to in the Comments and Responses (C&R) Report (Appendix C8) All comments raised during the 45-day review and comment period of the BA Report and through on-going consultation with I&APs will be included and responded to as part of a C&R Report

Requirement	Relevant Section
	(Appendix C8) to be submitted as part of the Final BA Report to the DFFE 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 Poortjie Wes Cluster Grid has been included in section 5.5.
(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 for the Poortjie Wes Cluster Grid is included in section 5.6.

5.2 Relevant legislative permitting requirements

The legislative permitting requirements applicable to the Poortjie Wes Cluster Grid, as identified at this stage in the process, are described in more detail under the respective sub-headings.

5.2.1 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(5) 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. Due to the fact that the 400kV MTS and power line are required associated infrastructure to six power generation projects and therefore relates to the IRP 2010 – 2030, the National Department of Forestry, Fisheries and the Environment (DFFE) has been determined as the Competent Authority in terms of GN R779 of 01 July 2016. The Provincial Eastern Cape Department of Economic Development, Environmental Affairs and Tourism (DEDEAT) is the 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.

As the proposed development is located within the Central Corridor of the Strategic Transmission Corridors, the EIA process to be followed for the Poortjie Wes Cluster Grid will be as per GN R113, as formally gazetted on 16 February 2018. The Poortjie Wes Cluster Grid is now subject to a Basic Assessment process and not a full EIA process, as well as a shortened timeframe of 57 days for the processing of an application for environmental authorisation.

The BA process being conducted for the Poortjie Wes Cluster Grid is undertaken in accordance with Section 24(5) of the NEMA, which defines the procedure to be followed in applying for Environmental Authorisation, 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 5.1 details the listed activities in terms of the EIA Regulations, 2014 (as amended) that apply to the Poortjie Wes Cluster Grid, and for which an application for Environmental Authorisation has been submitted to the DFFE. The table also includes a description of the specific project activities that relate to the applicable listed activities.

Table 5.1: Listed activities as per the EIA regulations that are triggered by the Poortjie Wes Cluster Grid

Activity No(s):	Relevant Basic Assessment Activity(ies) as set out in Listing Notice 1 of the EIA Regulations, 2014 as amended	Aspect of the proposed project to which the applicable listed activity relates.
GNR 327 (LN1), Activity No. 11 (i)	The development of facilities or infrastructure for the transmission and distribution of electricity— (i) outside urban areas or industrial complexes with a capacity of more than 33 but less than 275 kilovolts.	Each of the six (6) PV facilities will have a 132kV facility substation are proposed as part of the PV facility to connect the PV facility to the Eskom electricity grid. The project site falls outside the urban area.
GNR 327 (LN1) Activity No. 12(ii)(a)(c)	The development of – (ii) Infrastructure or structures with a physical footprint of 100 square metres or more Where such development occurs- (a) within a watercourse; or (c) within 32 metres of a watercourse.	The development of the Poortjie Wes Cluster Grid will require the establishment of infrastructure with a physical footprint of more than 100 square metres. The construction and operation of the Poortjie Wes Cluster Grid will occur within freshwater/drainage features, as well as within 32m of these features.
GNR 327 (LN1), Activity No. 14	The development and related operation of facilities or infrastructure, for the storage, or for the storage and handling, of a dangerous good, where such storage occurs in containers with a combined capacity of 80 cubic metres or more but not exceeding 500 cubic metres.	The development of the Grid will require the construction and operation of facilities and infrastructure for the storage and handling of dangerous goods (combustible and flammable liquids, such as oils, lubricants, solvents) associated with the on-site substation where such storage will occur inside containers with a combined capacity exceeding 80 cubic meters but not exceeding 500 cubic meters.
GNR 327 (LN1) Activity No. 19(i)	The infilling or depositing of any material of more than 10 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10 cubic metres from a Watercourse.	The site for the Poortjie Wes Cluster Grid is associated with the presence of freshwater/drainage features. Therefore, during the construction phase, 10 cubic metres of rock will be removed from the watercourses for the development of the grid and associated infrastructure.
GNR 327 (LN1) Activity No. 24(ii)	The development of a road – (ii) with a reserve wider than 13.5m, or where no reserve exists where the road is wider than 8m.	A service road (12 – 13m in width) will be required under the power line.

		The construction of the Poortjie Wes Cluster Grid will require the construction of new access roads of 12 -13m wide in areas where no road reserve exists to provide access to the facility.
GNR 327 (LN1), Activity No. 28	Residential, mixed, retail, commercial, industrial or institutional developments where such land was used for agriculture, game farming, equestrian purposes or afforestation on or after 01 April 1998 and where such development: (ii) will occur outside an urban area, where the total land to be developed is bigger than 1 hectare;	The total area to be developed for the proposed grid connection infrastructure is greater than 1ha and occurs outside an urban area in an area currently zoned for agriculture.
56(ii)	The widening of a road by more than 6 metres, or the lengthening of a road by more than 1 kilometre (ii) where no reserve exists, where the existing road is wider than 8 metres.	Existing farm roads within the project site may require widening, and access roads will be widened by more than 6 metres.

Activity No(s):	**Relevant Basic Assessment Activity(ies) as set out in Listing Notice 3 of the EIA Regulations, 2014 as amended**	**Aspect of the proposed project to which the applicable listed activity relates.**
4(i)(ii)(aa)	The development of a road wider than 4 metres with a reserve less than 13.5 metres. i. Western Cape ii. Outside urban areas: (aa) Areas containing indigenous vegetation.	A service road (12 – 13m in width) will be required under the power line. The development of the Poortjie Wes Cluster Grid will require the development of access roads of 12 – 13m wide, and internal distribution roads up to 12m wide in the Western Cape Province and outside urban areas. The project site is associated with the presence of natural vegetation.
10(i)(ii)	The development and related operation of facilities or infrastructure for the storage, or storage and handling of a dangerous good where such storage occurs in containers with a combined capacity of 30 but not exceeding 80 cubic metres i. Western Cape ii. All areas outside urban areas	The development of the Poortjie Wes Cluster Grid will require the construction and operation of facilities for the storage and handling of a dangerous goods (combustible and flammable liquids, such as oils, lubricants, solvents) associated with the onsite collector substation, where such storage will include containers with a capacity of 80 cubic meters. The site is located outside of urban areas.
12 (b)(c)	The clearance of an area of 300 square metres or more of vegetation where 75% or more of the vegetative cover I constitutes indigenous vegetation. (b) within critical biodiversity areas identified in bioregional plans;	The development of the Poortjie Wes Cluster Grid will require the clearance of 300 square metres or more of vegetation where 75% or more of the vegetative cover I constitutes indigenous vegetation. The Grid transverses areas classified as CBAs as identified in bioregional plans.
14(ii)(a)(c)(i)(i)(ff)	The development of—	The development of Poortjie Wes Cluster Grid will require the establishment of infrastructure

	(ii) infrastructure or structures with a physical footprint of 10 square metres or more; where such development occurs— (a) within a watercourse; or (c) within 32 metres of a watercourse, measured from the edge of a watercourse. i. Western Cape i. Outside urban areas: (ff) Critical biodiversity areas or ecosystem service areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans.	with a physical footprint exceeding 10m^2 within areas classified as CBA.
18(i)(ii)(aa)	The widening of a road by more than 4 metres, or the lengthening of a road by more than 1 kilometre. i. Western Cape ii. All areas outside urban areas: (aa) Areas containing indigenous vegetation;	Existing farm roads within the project site may require widening, and access roads will be widened by more than 6 metres. The site is located outside an urban area and within an area containing indigenous vegetation.

Activity No(s):	**Relevant Scoping and EIR Activity(ies) as set out in Listing Notice 2 of the EIA Regulations, 2014 as amended.**	**Aspect of the proposed project to which the applicable listed activity relates.**
GNR 325 (LN2), Activity No. 27	The clearance of an area of 1 hectare or more, but less than 20 hectares of indigenous vegetation, except where such clearance of indigenous vegetation is required for- (i) the undertaking of a linear activity; or (ii) maintenance purposes undertaken in accordance with a maintenance management plan	The development of the Poortjie Wes Cluster Grid will require the clearance of an area of 1 hectare or more and is classified as a linear activity.

5.2.2 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 Department of Human Settlements, Water and Sanitation). 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 5.2 lists the possible 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 5.2: List of Water Uses published under Section 21 of NWA, as amended.

Activity No.	Description of Water Use
Section 21 (a)	Taking water from a water resource. *Groundwater from existing boreholes will be abstracted for use during the construction and operation phases for the Poortjie Wes Cluster Grid.*
Section 21 (c)	Impeding or diverting the flow of water in a watercourse. *The project site considered for the establishment of the Poortjie Wes Cluster Grid and associated infrastructure is associated with the presence of watercourses. Activities pertaining to the establishment of the electrical grid infrastructure might encroach on the wetland features which may lead to an impediment and diversion of the flow of water in the features.*
Section 21 (g)	Disposing of waste in a manner which may detrimentally impact on a water resource. *Typically, the conservancy tanks at construction camps and the O/M buildings require a license (GA if volumes are below 10 000 m^3); however, the Project's requirements will be part of the application of the solar energy facilities connecting to the MTS.*
Section 21 (i)	Altering the bed, banks, course, or characteristics of a watercourse. *The project site considered for the establishment of the Poortjie Wes Cluster Grid and associated infrastructure is associated with the presence of watercourses. Activities pertaining to the establishment of the electrical grid infrastructure might encroach on the drainage lines present within the development area which may lead to an impediment and diversion of the flow of water in the features.*

In the event that the flow of water in the watercourses is affected and the bed, banks or course characteristics are altered, then licensing would be required. An application would need to be made for a WUL as internal access roads will cross watercourses. This will need to be in accordance with the requirements of the Regulations Regarding the Procedural Requirements for Water Use License Applications and Appeals (GN R267), 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. This is in line with the requirements of the Department of Water and Sanitation.

5.2.3 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 Poortjie Wes Cluster Grid, 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 (GN R668).

5.3 Overview of the Basic Assessment Process for the Poortjie Wes Cluster Grid

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. DFFE) in terms of Regulations 5 and 6 of the EIA Regulations, 2014 (GN R326), as amended.
- Undertaking a public participation process in accordance with Chapter 6 of GN R326, 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.
- Undertaking of independent specialist studies in accordance with Appendix 6 of the EIA Regulations, 2014 (GN R326), as amended, and the requirements of the Specialist Protocols published in Regulation GNR 320, issued 20 March 2020 and 30 October 2020.
- Preparation of a BA Report and EMPr in accordance with the requirements of Appendix 1 and Appendix 4 of GN R326.
- 45-day public and authority review period of the BA report.
- Compilation of a 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 DFFE for review and decision-making.

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

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

In terms of Government Notice 779 of 01 July 2016, the National Department of Forestry, Fisheries, and the Environment (DFFE) is the competent authority for all projects related to the IRP. The proposed Poortjie Wes Cluster Grid are required associated infrastructure for various renewable energy facilities (including four wind farms and two solar energy facilities). As the project is located within the Eastern Cape Province, the Provincial Eastern Cape Department of Economic Development, Environmental Affairs and Tourism (DEDEAT) is the commenting authority. Consultation with the regulating authorities (i.e. DFFE and DEDEAT) as well as with all other relevant Organs of State will continue throughout the BA process. To date, this consultation has included the following:

- Holding of a Pre-application Meeting with the DFFE on **10 may 2022** (via the Microsoft Teams Platform) during which the project details, progress and proposed Public Participation Plan was presented.
- Submission of the application form for Environmental Authorisation to the DFFE via the use of the DEA Novell Filr System.
- 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.

The submissions, as listed above, were undertaken electronically, as required by the DFFE (in line with the directions for new Applications for Environmental Authorisations provided for in GN R650 of 05 June 2020).

A record of all authority correspondence undertaken during the BA process is included in **Appendix B.**

5.3.2. 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 Interested and Affected Parties ("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; 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. fax, post, email, WhatsApp, and SMSs.
- An adequate review period is provided for I&APs to comment on the findings of the BA Report.

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:

- 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;
- 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.

In terms of the requirement of Chapter 6 of the EIA Regulations of December 2014, as amended, the following key public participation tasks have been undertaken:

- Fix a notice board at a place conspicuous to the public at the boundary or on the fence of—
  - (i) the site where the activity to which the application relates is or is to be undertaken; and
  - (ii) any alternative site mentioned in the application;
- Give written notice to:
  - (i) the owner or person in control of that land if the applicant is not the owner or person in control of the land;
  - (ii) the occupiers of the site where the activity is or is to be undertaken or to any alternative site where the activity is to be undertaken;
  - (iii) owners and occupiers of land adjacent to the site where the activity is or is to be undertaken or to any alternative site where the activity is to be undertaken;
  - (iv) the municipal councillor of the ward in which the site or alternative site is situated and any organisation of ratepayers that represent the community in the area;
  - (v) the municipality which has jurisdiction in the area;
  - (vi) any organ of state having jurisdiction in respect of any aspect of the activity; and
  - (vii) any other party as required by the competent authority.
- Place an advertisement in one local newspaper.
- Open and maintain a register of I&APs and Organs of State.
- Release a BA Report for a 30-day review period.
- Prepare a Comments and Responses (C&R) report which documents the comments received on the BA process and the responses provided by the project team.

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 5.2**.

Table 5.2: List of Stakeholders identified for the inclusion in the project database during the public participation process for the Poortjie Wes Cluster Grid

» **Organs of State**
» National Government Departments

» Department of Mineral Resources and Energy ("DMRE")
» Department of Forestry, Fisheries, and the Environment ("DFFE")
» Department of Agriculture, Rural Development and Land Reform ("DARDLR")
» Department of Water and Sanitation ("DHSWS")
» Government Bodies and State-Owned Companies
» Eskom Holdings SOC Limited ("Eskom")
» National Energy Regulator of South Africa ("NERSA")
» South African Civil Aviation Authority ("CAA")
» South African National Roads Agency Limited ("SANRAL")
» Square Kilometre Array Project ("SKA")
» Telkom SA SOC Limited ("Telkom")
» Transnet SA SOC Limited ("Transnet")
» Provincial Government Departments
» Western Cape Department of Environmental Affairs and Development Planning
» Western Cape Department of Roads and Public Works
» Heritage Western Cape
» Local Government Departments
» Central Karoo District Municipality
» Beaufort West Local Municipality
» Key Stakeholders
» BirdLife South Africa
» Endangered Wildlife Trust ("EWT")
» SENTECH SOC Limited ("SENTECH")
» Wildlife and Environment Society of South Africa ("WESSA")
» 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 of[14]:

- all persons who requested to be registered on the database through the use of the online stakeholder engagement platform (i.e. website) or in writing and disclosed their interest in the project;
- 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 ongoing 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 47D 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;
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 –

[14] 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).

(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 the 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 C3**) providing technical and environmental details on the project and how to become involved in the BA process. The BID and the BA process notification letter announcing the BA process, notifying Organs of State, potentially affected and neighbouring landowners, as well as registered stakeholders/IAPs of Poortjie Wes Cluster Grid, providing background information of the project and inviting I&APs to register on the project's database were distributed via email on **03 June 2022**. The evidence of the distribution is contained in **Appendix C** of the BA Report. The BID is also available electronically on the Savannah Environmental website (https://savannahsa.com/public-documents/energy-generation/montana-1-solar-energy-facility/).
» Placement of site notices announcing the BA process at visible points along the boundary of the study area (i.e. the boundaries of the affected property), in accordance with the requirements of the EIA Regulations Placed on 25, 29 & 30 May 2022 and 02 June 2022. Photographs and the GPS co-ordinates of the site notices are contained in **Appendix C2** of the BA Report and are also available on the Savannah Environmental online platform. Process notices announcing the BA were placed in Murraysburg Library, Murraysburg Police Station, Beaufort West Police Station and Beaufort West Libraray.
» Placement of an advertisement in the Die Burger on **03 June 2022** at the commencement of the 30-day review and comment period. This advert announced the project, the BA process, the details to access the Savannah Environmental online platform, as well as the availability of the BA report on this platform and invited comment on the BA Report. This advert also included the details on the review period for the BA report. A copy of the newspaper advert as sent to the newspaper is included in **Appendix C2** of the BA Report. The newspaper advert tear sheet will be included in the Final BA Report in **Appendix C2.**
» The BA Report has been made available for review by I&APs for a 30-day review and comment period from **04 June 2022** to **14 July 2022.**[15] Electronic versions of the BA Report and CD copies were requested have been circulated to Organs of State via courier at the commencement of the review period. The BA Report is also available for download on the Savannah Environmental's website. The evidence of distribution of the BA Report will be included in the final BA Report, which will be submitted to the DFFE.

iii. Public Involvement and Consultation

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:

[15] Given unforeseen circumstance the advertised review period (04 April to 09 May 2022) was extended to 12 May 2022.

Table 5.3: Consultation undertaken with I&APs for Poortjie Wes Cluster Grid

Activity	Date
Distribution of the process notification 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 were also made available on the virtual platform.	25th May 2022 to the 02 June 2022
Placement of site notices on-site and in public places (Local Municipality and Home Affairs).	Placed on 25, 29 & 30 May 2022 and 02 June 2022
Advertising of the availability of the BA Report for a 30-day review period in the Die Burger newspaper, including details on how to access the online platform and the BA Report via this means.	03 June 2022
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.	03 June 2022
30-day review and comment period of the BA Report.	08 June 2022 to 14 July 2022
Virtual Meetings through virtual presentations on the Savannah Environmental Virtual Platform: » 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 and 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 process

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.

I&APs registered on the database have been notified using 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 the timeframe within which such comment must be made. The report has been made available for download from the Savannah website and in CD format (where requested). Where requested, hard copy reports will be provided

Where I&APs were not able to provide written comments, other means of consultation, such as telephonic discussions were used to provide the I&APs with a platform to verbally raise their concerns and comments on the proposed development. Submission of comments and queries was also enabled through the use of the Savannah Environmental website. The comments raised during the discussions and written comments have been recorded and included in **Appendix C8** of the BA Report.

v. Identification and Recording of Comments

Comments raised by I&APs throughout the BA have been synthesised into a Comments and Responses (C&R) Report which is included in **Appendix C8** of the BA Report. This includes comments raised through the use of the Savannah Environmental online platform. The C&R Report includes detailed responses from members of the EIA project team and/or the project proponent to the issues and comments raised during the public participation process.

The C&R Report will consist of written comments received as well as responses from the project proponent, EAP, and specialist consultants, where relevant.

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**.

The C&R Report will be updated with all comments received during the 30-day review and comment period and will be included as **Appendix C8** in the final BA Report that will be submitted to the DFFE for decision-making

5.4. Outcomes of the DFFE Web-Based Screening Tool

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 Regulations 19 and 21 of the EIA Regulations.

The requirement for the submission of a Screening Report (included as **Appendix M** of the BA Report) for the Poortjie Wes Cluster Gridis applicable as it triggers Regulation 19 of the EIA Regulations, 2014 (as amended). **Table 5.5** provides a summary of the specialist assessments identified in terms of the screening tool and responses to each assessment from the project team considering the development area under consideration.

Table 5.5: Sensitivity ratings from the DFFE's web-based online Screening Tool associated with the development of the Poortjie Wes Cluster Grid

Specialist Assessment	Sensitivity Rating as per the Screening Tool (relating to the need for the study)	Project Team Response
Agricultural Impact Assessment	Medium	The Soils, Land Use and Agriculture Impact Assessment is included in this BA Report as Appendix F.
Archaeological and Cultural Heritage Impact Assessment	Low	A Heritage Impact Assessment (which covers both archaeological and cultural aspects of the project site and development footprint) has been undertaken for the Poortjie Wes Cluster Grid and is included in this BA Report as Appendix G.
Civil Aviation Impact Assessment	Low	The Civil Aviation Authority will be consulted throughout the BA process to obtain input.
Defence theme Impact Assessment	Low	Any nearby military base will be consulted for inputs as part of the BA process.
Palaeontology Impact Assessment	Low	The Heritage Impact Assessment (included as Appendix G) of the BA Report includes an assessment of palaeontological resources within the project site and development footprint.
Terrestrial Biodiversity Impact Assessment	Very high	An Ecological Impact Assessment (including flora and fauna) has been undertaken for the Poortjie Wes Cluster Grid and is included as Appendix D of the BA Report.
Aquatic Biodiversity Impact Assessment	Very high	An Ecological Impact Assessment (including flora, fauna and water resources) has been undertaken for the Poortjie Wes Cluster Grid and is included as Appendix D of the BA Report.
Geotechnical Assessment	The screening report does not indicate a rating for this theme.	A technical report considering Geotechnical consideration of the site is included as Appendix S of the BA Report.
Plant Species Assessment	Medium	An Ecological Impact Assessment (including flora and fauna) has been undertaken for the Poortjie Wes Cluster Grid and is included as Appendix D of the BA Report.
Animal Species Assessment	High	

5.5. Assessment of Issues Identified through the BA Process

Issues identified as requiring investigation, as well as the specialist consultants involved in the assessment of these impacts are indicated in **Table 5.6** below.

Table 5.6: Specialist consultants appointed to evaluate the potential impacts associated with the Poortjie Wes Cluster Grid

Issue/Assessment	Specialist Name	Specialist Company	Appendices
Biodiversity Impact Assessment	Mahomed Desai	The Biodiversity Company	Appendix D
Avifauna Impact Assessment	Ashlin Bodasin	Arcus Consultancy Service	Appendix E
Soils Compliance Statement	Matthew Mamera	The Biodiversity Company	Appendix F
Heritage Impact Assessment	Jenna Lavin	CTS Heritage	Appendix G

Issue/Assessment	Specialist Name	Specialist Company	Appendices
	Nicholas Willtshire		
Visual Impact Assessment	Bryony Van Niekerk Lourens du Plesses	NuLeaf Planning and Environmental & LOGIS	Appendix H
Traffic Impact Assessment	Iris Wink	JG Africa	Appendix J
Social Impact Assessment	Tony Barbour	Tony Barbour Environmental and Social Assessment Consultant	Appendix I

Specialist studies considered direct and indirect environmental impacts associated with the development of all components of the Poortjie Wes Cluster Grid. 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).

Specialist studies also considered cumulative impacts associated with similar developments within a 30km radius of the proposed project. The purpose of the cumulative assessment is to test if such impacts are relevant to the proposed project in the proposed location (i.e. whether the addition of the proposed project in the area will increase the impact). In this regard, specialist studies considered whether the construction of the proposed development will result in:

- Unacceptable risk
- Unacceptable loss
- Complete or whole-scale changes to the environment or sense of place
- Unacceptable increase in impact

A conclusion regarding whether the proposed development will result in any unacceptable loss or impact considering all the projects proposed in the area is included in the respective specialist reports.

As the proponent 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. An assessment of impacts with mitigation is made in order to demonstrate the effectiveness of the proposed mitigation measures. Environmental Management Programmes which include all mitigation measures recommended by the specialists for the management of significant impacts are included as **Appendix K** and **Appendix L**. The EMPrs are in line with GN R.453 of March 2019 and the Generic Environmental Management programme (EMPr) for the Development and Expansion of Substation Infrastructure for the Transmission and Distribution of Electricity has been used for the 400kV MTS. The Generic EMPr for the Development and Expansion of Overhead Power Line Infrastructure for the Transmission and Distribution of Electricity has been used for the loop-in loop-out 400kV power lines.

5.6 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 the grid infrastructure identified by the developer represents a technically suitable site for the establishment of the Poortjie Wes Cluster Grid 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 – J** for specialist study-specific limitations.

5.7 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);
- Department of Environmental Affairs (2017), Public Participation guidelines in terms of NEMA EIA Regulations;
- Department of Environmental Affairs (2017), Integrated Environmental Management Guideline: Guideline on Need and Desirability;
- 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 5.7 provides an outline of the legislative permitting requirements applicable to the Poortjie Wes Cluster Grid as identified at this stage in the project process.

Table 5.7: Applicable Legislation, Policies and/or Guidelines associated with the development of the Poortjie Wes Cluster Grid

Legislation	Applicable Requirements	Relevant Authority	Compliance Requirements
National Legislation			
Constitution of the Republic of South Africa (No. 108 of 1996)	In terms of Section 24, the State has an obligation to give effect to the environmental right. The environmental right states that: "*Everyone has the right –* » *To an environment that is not harmful to their health or well-being, and* » *To have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that:* * *Prevent pollution and ecological degradation,* * *Promote conservation, and* * *Secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development*."	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)	The 2014 EIA Regulations have been promulgated in terms of Chapter 5 of NEMA. Listed activities that may not commence without EA are identified within the Listing Notices (GNR 327, GN,R 325 and GNR 324) which form part of these Regulations (GNR 326). 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. Considering the location of the project site within the Breaufort West Renewable Energy Development Zone (REDZ 11) and the requirements GG 44191 of 26 February 2021, a	DFFE – Competent Authority Western Cape DAEARD&LR – Commenting Authority	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
	Basic Assessment Process is required to be undertaken for the proposed project. All relevant listing notices for the project (GN R327, GN R325 and GN R324) will be applied for		
National Environmental Management Act (No 107 of 1998) (NEMA)	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. 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.	DFFE Western Cape DAEARD&LR	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)	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, Northwest, Mpumalanga, Northern Cape, Eastern Cape, and KwaZulu-Natal Provinces. 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. 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).	DFFE Western Cape DAEARD&LR Central Karoo District 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 on the local community. There is therefore no requirement for a noise permit in terms of the legislation.

Legislation	Applicable Requirements	Relevant Authority	Compliance Requirements
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 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. 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 that impact detrimentally on a water resource), altering a watercourse, removing water found underground for certain purposes, and recreation. Consumptive water uses may include taking water from a water resource (Section 21(a)), and storing water (Section 21(b)). Non-consumptive water uses may include impeding or diverting flow in a watercourse (Section 21(c)), and altering of bed, banks, or characteristics of a watercourse (Section 21(i)).	Regional Department of Water and Sanitation	Several non-perennial drainage features are present within the development area and within close proximity of the development area. The project proponent would need to apply for a WUL or register a GA with the DWS should any trigger water use activities be undertaken.
Minerals and Petroleum Resources Development Act (No. 28 of 2002) (MPRDA)	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.	Department of Mineral Resources and Energy	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.
	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		In terms of Section 53 of the MPRDA approval is required from the Minister of Mineral Resources to ensure that the

Legislation	Applicable Requirements	Relevant Authority	Compliance Requirements
	any such object must apply to the Minister for approval in the prescribed manner.		proposed development does not sterilise a mineral resource that might occur on site.
National Environmental Management: Air Quality Act (No. 39 of 2004) (NEM: AQA)	The National Dust Control Regulations (GNR 827) published under Section 32 of NEM: AQA prescribes the general measures for the control of dust in all areas and provides a standard for acceptable dustfall rates for residential and non-residential areas. 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. 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.	Western Cape DAEARD&LR / ZF Central Karoo District Municipality	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, Montana 1 Solar Energy facility is not anticipated to result in significant dust generation.
National Heritage Resources Act (No. 25 of 1999) (NHRA)	Section 07 of the NHRA stipulates assessment criteria and categories of heritage resources according to their significance. Section 35 of the NHRA provides for the protection of all archaeological and palaeontological sites, and meteorites. 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. Section 38 of the NHRA lists activities which require developers or any person who intends to undertake a listed activity to notify the responsible heritage resources authority	Heritage Western Cape	No archaeological resources of significance were identified within the area proposed for development although the broader area has archaeological significance in terms of the sensitive dolerite outcrops in the broader area. No further mitigation is recommended. No observations of palaeontological significance were noted within the area proposed for development. However, the geology underlying the development area remains sensitive for impacts to significant palaeontological heritage.

Legislation	Applicable Requirements	Relevant Authority	Compliance Requirements
	and furnish it with details regarding the location, nature, and extent of the proposed development. 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.		Should a heritage resource be impacted, a permit may be required from SAHRA or Heritage Western Cape in accordance with 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 infrastructure within the development area has been determined.
National Environmental Management: Biodiversity Act (No. 10 of 2004) (NEM: BA)	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. Three government notices have been published in terms of Section 56(1) of NEM: BA as follows: » Commencement of TOPS Regulations, 2007 (GNR 150). » Lists of critically endangered, vulnerable, and protected species (GNR 151). » TOPS Regulations (GNR 152). 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).	DFFE Western Cape DAEARD&LR	Under NEM: BA, a permit would be required for any activity which is of a nature that may negatively impact the survival of a listed protected species. The Ecological Impact Assessment (**Appendix D**) identified listed species. Based on the SANBI POSA records for the site and surrounding area, species of conservation concern are potentially present on the site. A permit from Cape Nature will be required for the removal of listed species identified in the project site.

Legislation	Applicable Requirements	Relevant Authority	Compliance Requirements
National Environmental Management: Biodiversity Act (No. 10 of 2004) (NEM: BA)	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. Applicable, and exempted alien and invasive species are contained within the Alien and Invasive Species List (GNR 864).	DFFE Western Cape DAEARD&LR	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. The Ecological Impact Assessment (**Appendix D**) identified listed species. Based on the SANBI POSA records for the site and surrounding area, species of conservation concern are potentially present on the site. A permit from Cape Nature will be required for the removal of listed species identified in the project site.
Conservation of Agricultural Resources Act (No. 43 of 1983) (CARA)	Section 05 of CARA provides for the prohibition of the spreading of weeds. 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. 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.	Department of Agriculture, Land Reform and Rural Development (DALRRD)	CARA will find application throughout the life cycle of the project. In this regard, soil erosion prevention and soil conservation strategies need to be developed and implemented. In addition, a weed control and management plan must be implemented. The permission of DALRRD and the Western Cape Department of Agriculture will be required if Montana 1 Solar Energy facility requires the draining of vleis, marshes or water sponges on land outside urban areas. However, this is not anticipated to be relevant for the project.

Legislation	Applicable Requirements	Relevant Authority	Compliance Requirements
			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: » 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). » 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.
National Forests Act (No. 84 of 1998) (NFA)	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	DFFE	A licence is required for the removal of protected trees. It is therefore necessary to conduct a survey that will determine the

Legislation	Applicable Requirements	Relevant Authority	Compliance Requirements
	National Forests Act (No. 84 of 1998) was published in GNR 734. 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".		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. The Ecological Impact Assessment undertaken as part of the BA Report indicated that One species of flora protected under provincial legislation were recorded within the project area during the survey period, namely: » Aizoaceae (*Mesembryanthemum coriarium*) A license in terms of the NFA will be required for impacting on the protected species identified at the site, (refer to **Appendix D** of this BA Report).
National Veld and Forest Fire Act (No. 101 of 1998) (NVFFA)	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 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.	DFFE	While no permitting or licensing requirements arise from this legislation, this Act will be applicable during the construction and operation of the Montana 1 Solar Energy facility, in terms of the preparation and maintenance of firebreaks, and the need to provide appropriate equipment and personnel for firefighting purposes.

Legislation	Applicable Requirements	Relevant Authority	Compliance Requirements
	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 a 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.		
Hazardous Substances Act (No. 15 of 1973) (HAS)	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. » 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, hea,t or other means, cause extreme risk of injury etc., can be declared as Group I or Group II substance » Group IV: any electronic product, and » Group V: any radioactive material. The use, conveyance, or storage of any hazardous substance (such as distillate fuel) is prohibited without an appropriate license being in force.	Department of Health (DoH)	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 DOH.

Legislation	Applicable Requirements	Relevant Authority	Compliance Requirements
National Environmental Management: Waste Act (No. 59 of 2008) (NEM: WA)	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. The Minister may amend the list by – » Adding other waste management activities to the list. » Removing waste management activities from the list. » Making other changes to the particulars on the list. 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. Any person who stores waste must at least take steps, unless otherwise provided by this Act, to ensure that: » The containers in which any waste is stored, are intact and not corroded or in » Any other way rendered unlit 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 » Pollution of the environment and harm to health are prevented.	DFFE – hazardous waste Western Cape DAEARD&LR – general waste	No listed activities are triggered by Montana 1 Solar Energy facility 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.
National Road Traffic Act (No. 93 of 1996) (NRTA)	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	SANRAL – national roads Western Cape Department:	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

Legislation	Applicable Requirements	Relevant Authority	Compliance Requirements
	roads and the detailed procedures to be followed in applying for exemption permits are described and discussed. 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. 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.	Transport and Public Works	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			
Western Cape Nature Conservation Ordinance (Act No. 19 of 1974)	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 regulations, the following may apply to the current project: » Boundary fences may not be altered in such a way as to prevent wild animals from freely moving onto or off of a property; » Aquatic habitats may not be destroyed or damaged;	Cape Nature	A collection/destruction permit must be obtained from Western Cape Nature Conservation for the removal of any protected plant or animal species found on site.

Legislation	Applicable Requirements	Relevant Authority	Compliance Requirements
	» The owner of the land upon which an invasive species is found (plant or animal) must take the necessary steps to eradicate or destroy such species; The Act provides lists of protected species for the Province.		

5.7.1 The IFC EHS Guidelines

The IFC EHS Guidelines are technical reference documents with general and industry specific examples of Good International Industry Practice (GIIP). The following IFC EHS Guidelines have relevance to the Poortjie Wes Cluster Grid:

- IFC EHS General Guidelines
- IFC EHS Guidelines for Electric Power Transmission and Distribution

The General EHS Guidelines are designed to be used together with the relevant Industry Sector EHS Guidelines. The application of the General EHS Guidelines should be tailored to the hazards and risks associated with a project and should take into consideration site-specific variables which may be applicable, such as host country context, assimilative capacity of the environment, and other project factors. In instances where host country regulations differ from the standards presented in the EHS Guidelines, whichever is the more stringent of the two in this regard should be applied.

The General EHS Guidelines include consideration of the following:

- Environmental:
  - Air Emissions and Ambient Air Quality
  - Energy Conservation
  - Wastewater and Ambient Water Quality
  - Water Conservation
  - Hazardous Materials Management
  - Waste Management
  - Noise
  - Contaminated Land
- Occupational Health and Safety:
  - General Facility Design and Operation
  - Communication and Training
  - Physical Hazards
  - Chemical Hazards
  - Biological Hazards
  - Radiological Hazards
  - Personal Protective Equipment (PPE)
  - Special Hazard Environments
  - Monitoring
- Community Health and Safety:
  - Water Quality and Availability
  - Structural Safety of Project Infrastructure
  - Life and Fire Safety (L&FS)
  - Traffic Safety
  - Transport of Hazardous Materials
  - Disease Prevention
  - Emergency Preparedness and Response
- Construction and Decommissioning:
  - Environment
  - Occupational Health & Safety
  - Community Health & Safety.

CHAPTER 6: DESCRIPTION OF THE RECEIVING ENVIRONMENT

This Chapter provides a description of the local environment that may be affected by the development of the Poortjie Wes Cluster Grid and associated infrastructure. 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 and economic environment 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.

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 Basic Assessment Reports.

Requirement	Relevant Section
3(h)(iv) the environmental attributes associated with the alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects	The environmental attributes associated with the project site and development envelope, as well as the broader environment, are described and considered within this chapter and includes the following:
	The regional setting within which the project site and development envelope are located is described in **section 6.2**.
	The climatic conditions of the area within which the project site is located is discussed in **section 6.3**.
	The biophysical characteristics of the project site, development envelope and the surrounding areas are described in **section 6.4.** These include topography and terrain, geology, soils, and land types/agricultural potential and biodiversity (i.e., ecology ((including fauna & flora)), avifauna and aquatic features) of the area to be affected by the development of the proposed infrastructure.
	The heritage of the project site, development envelope and the surrounding areas (including archaeology, palaeontology, and cultural aspects) is discussed in **section 6.5**.
	The visual quality of the affected area surrounding the project site is described in **section 6.6.**
	The social context within which the project site is located is described in **section 6.7**.

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

6.2 Regional Setting: Description of the Broader Study Area

The Western Cape is located on the southern tip of the African continent between the Indian and Atlantic Oceans. It is bordered by the Northern Cape and Eastern Cape provinces. The region is topographically

and climatically diverse. It has a temperate southern coastline fringed with mountains. To the north it stretches deep into the Karoo plateau, while the west coast is extremely dry.

The Western Cape is the fourth-largest province in South Africa and covers an area of 129 462km^2 and also ranks fourth in population with a population of 6 279 730. The capital city is Cape Town. Other major cities and towns include George, Knysna, Paarl, Swellendam, Oudtshoorn, Stellenbosch, Worcester, Mossel Bay and Strand.

The Western Cape is divided into one metropolitan municipality (City of Cape Town Metropolitan Municipality) and five district municipalities, which are further subdivided into 24 local municipalities. (Refer to **Figure 6.1**).

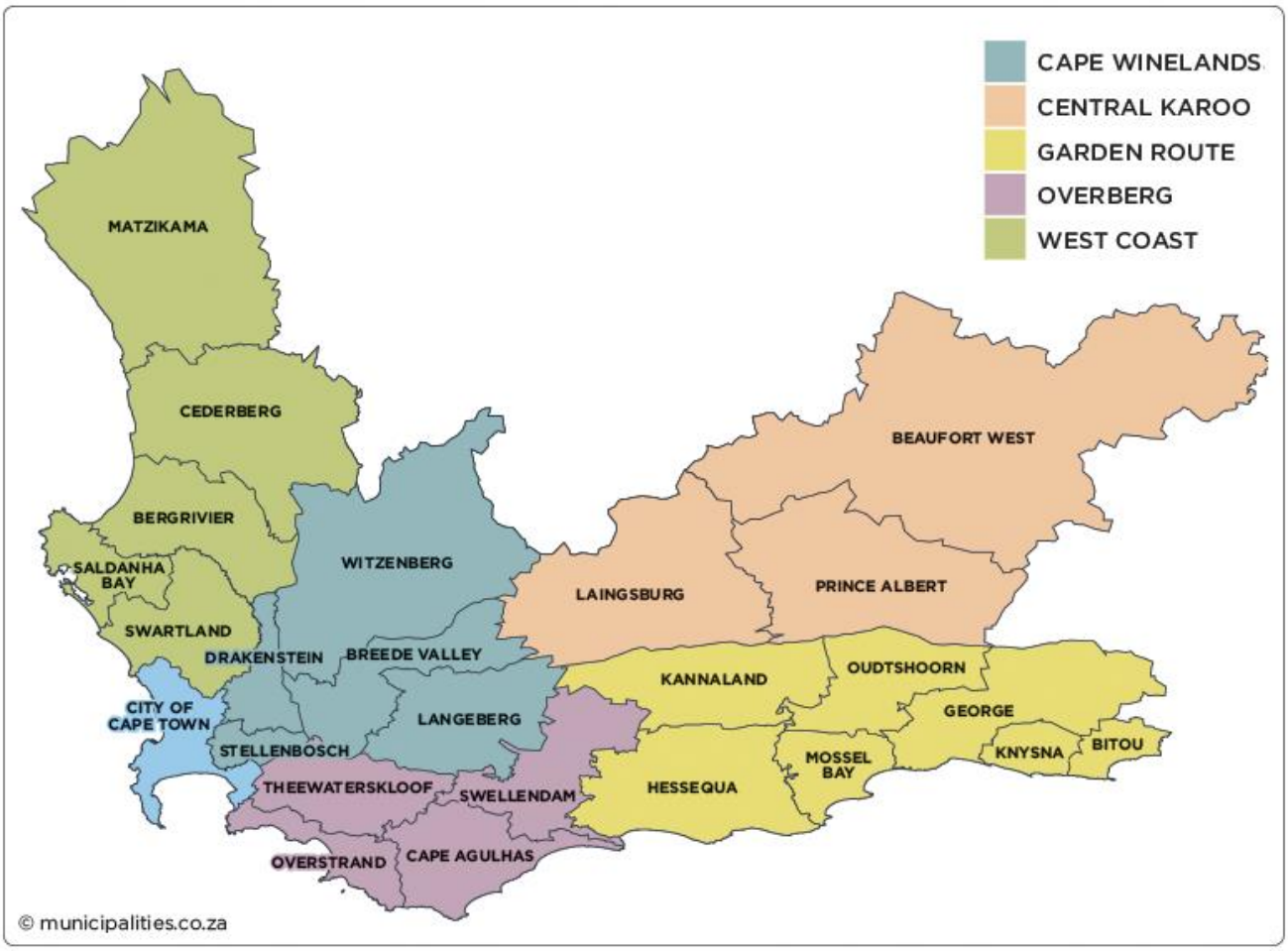


Figure 6.1: Districts of the Western Cape Province (Source: Municipalities of South Africa).

The Central Karroo District Municipality within which the study area is located is a Category C municipality covering an area of 38 854km^2 bordered by the Northern Cape to the north. Adjacent municipalities are the Pixley Ka Seme District Municipality in the north, Namakwa District Municipality in the north-west, Garden Route District Municipality in the south, Sarah Baartman District Municipality in the east and Cape Winelands District Municipality in the west. Major towns in the district include Beaufort West, which is the seat of the district, Klaarstroom, Laingsburg, Leeu Gamka, Matjiesfontein, Merweville, Murraysburg, Nelspoort, Prince

Albert, Welgemoed. Agriculture (47%), finance and business services (22%), community services (19%), construction (7%) are the main economic activities of the district.

The District Municipality comprises of 3 Local Municipalities, namely: Laingsburg, Prince Albert, and Beaufort West Local Municipalities (refer to **Figure 6.2**).

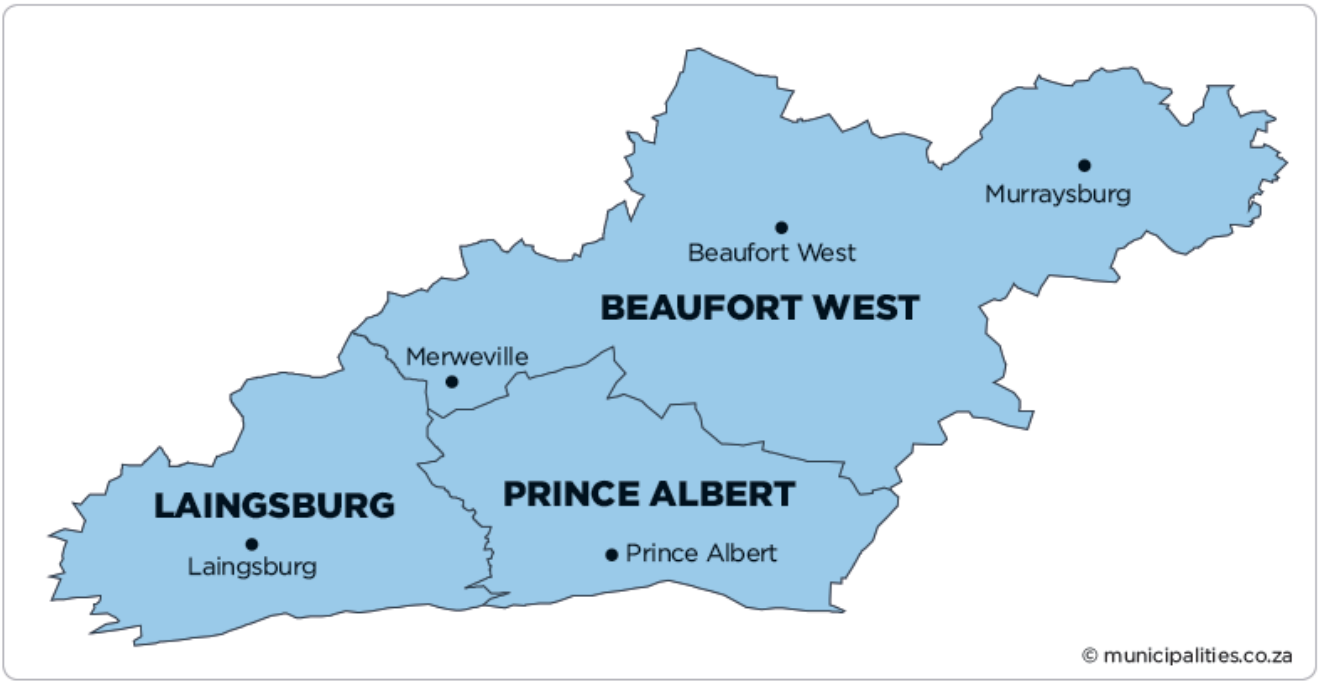


Figure 6.2: Local Municipalities which fall within the jurisdiction of the West Coast District (Source: Municipalities of South Africa).

The Beaufort West Local Municipality makes up three quarters of the geographical area of the Central Karoo District Municipality. The main towns in the municipality are Beaufort West and Nelspoort. Agriculture, finance, construction, community services are the main economic sectors of the municipality.

The study area is located on flat high lying land with hills to the north and south where the elevation ranges from 1120 m above sea level (a.s.l) on the site itself to1520 a.s.l for the Bruinrug and Vaalkoppe to the north and south respectively (Photograph 3.8). The land cover consists predominately of shrubland and bare rock and soil. Small areas of dryland agriculture and exotic plantations are present. The study area is located predominately within the Nama Karoo biome, with rainfall ranging from 123 mm -248 mm per annum. The vegetation type is classified as Gamka Karoo which is a low-lying vegetation type with small portions of Southern Karoo Riviere. The majority of the study area is sparsely populated and consists of a landscape of wide-open expanses and extreme isolation. The scarcity of water and other natural resources has influenced settlement within this region, keeping numbers low, and distribution limited to the availability of permanent water. Settlements, where they occur, are usually rural homesteads and farmsteads. Access to the study area is via secondary roads which link with one another, providing access to farmsteads.

6.3 Climatic Conditions

The project area is located within an arid region, as it is located in the rain shadow of the Cape Fold Mountains, specifically the Groot Swartberg Mountain Range, to the south. Based on the Köppen climate classification, the climate of the project area is classified as Cold desert climate (BWk) and Cold semi-arid climate (BSk). Regions classified as BWk usually feature hot, dry summers, though summers are not typically as hot as hot desert climates. Unlike hot desert climates, cold desert climates tend to feature cold, dry winters. Cold desert climates are typically found at higher altitudes than hot desert climates and are usually drier than hot desert climates. BSk regions tend to be located in elevated portions of temperate zones, typically bordering a humid continental climate or a Mediterranean climate. They are typically found in continental interiors some distance from large bodies of water. Cold semi-arid climates usually feature warm to hot dry summers, though their summers are typically not quite as hot as those of hot semi-arid climates. Unlike hot semi-arid climates, areas with cold semi-arid climates tend to have cold winters. These areas usually see some snowfall during the winter, though snowfall is much lower than at locations at similar latitudes with more humid climates.

Specific climate data for the project area was obtained from https://en.climate-data.org/. No data was available for the specific region and the data provided for the town of Beaufort West was used. January is the hottest month of the year with a mean temperature of 24.0 °C. The lowest mean temperature is recorded in July, at 11.1 °C. Most precipitation occurs during March (early Autumn), with an average of 57 mm. Precipitation is the lowest in June, with an average of 15 mm.

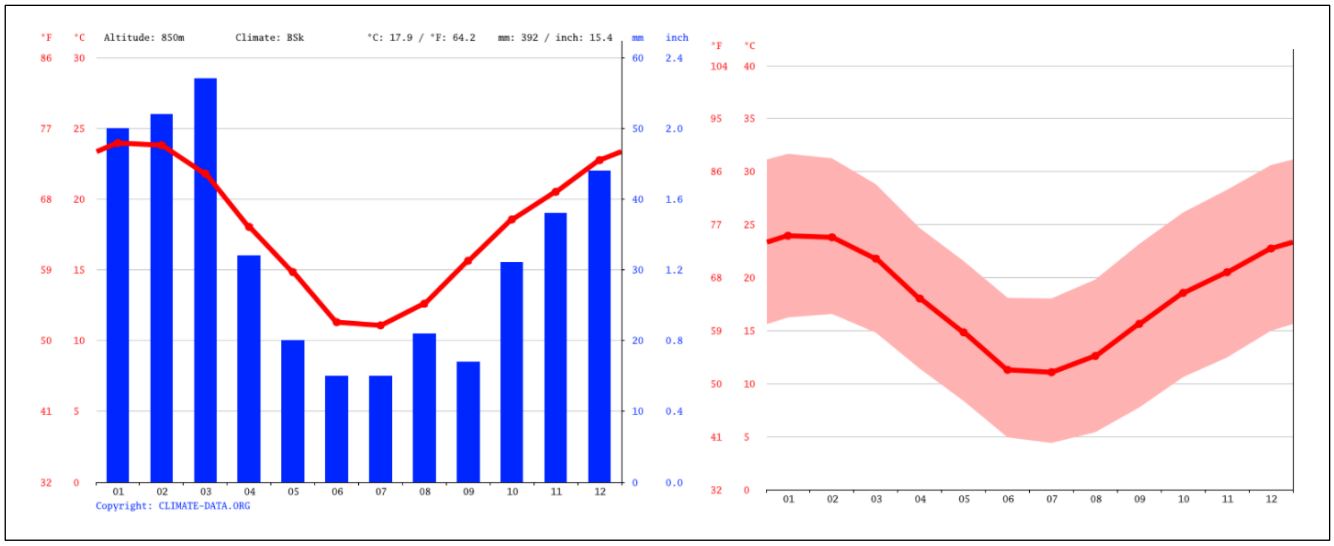


Figure 6.3: Climate and Temperature graphs for Beaufort West, Western Cape Province (Source: en.climate data.org).

Table 6.1: Climate data for Beaufort West area, Western Cape Province (Source: en.climate-data.org).

Average	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
High	91°F	90°F	86°F	78°F	71°F	66°F	66°F	69°F	75°F	80°F	83°F	88°F
Temp.	78°F	77°F	73°F	65°F	58°F	52°F	52°F	55°F	61°F	66°F	71°F	75°F
Low	64°F	64°F	60°F	53°F	46°F	40°F	39°F	42°F	47°F	52°F	58°F	62°F

6.4 Biophysical Characteristics of the Study Area

6.4.1 Topographical Profile

The slope percentage of the project areas has been calculated and is illustrated in Figure 6.4. Most of the project area is characterised by a slope percentage between 0 and 20%, with some smaller patches within the project area characterised by a slope percentage ranging from 20 to 78%. This illustration indicates a non-uniform topography in scattered areas (see Figure) most of the area being characterised by a gentle slope. The DEM of the project area (Figure 6.5) indicates an elevation of 1069 to 1234 Metres Above Sea Level (MASL).

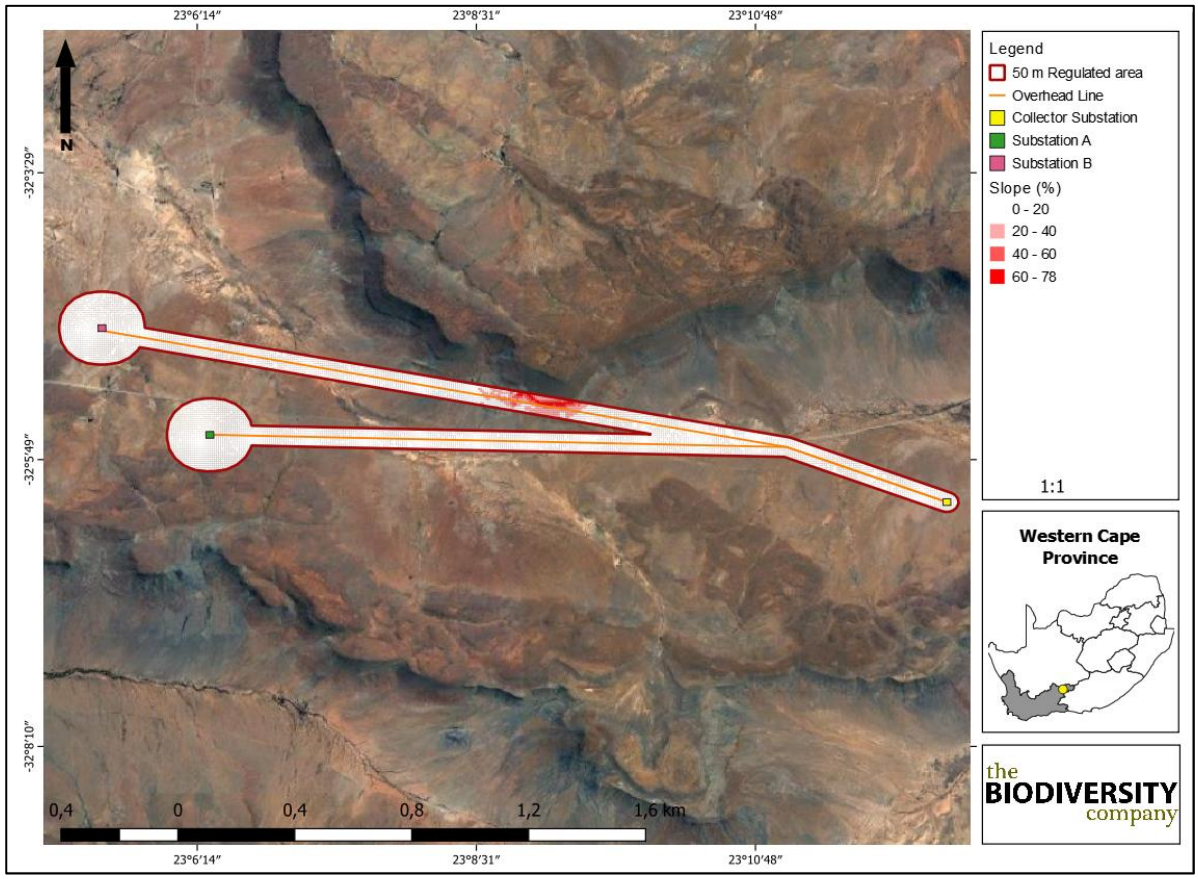


Figure 6.4 The slope percentage calculated for the project area

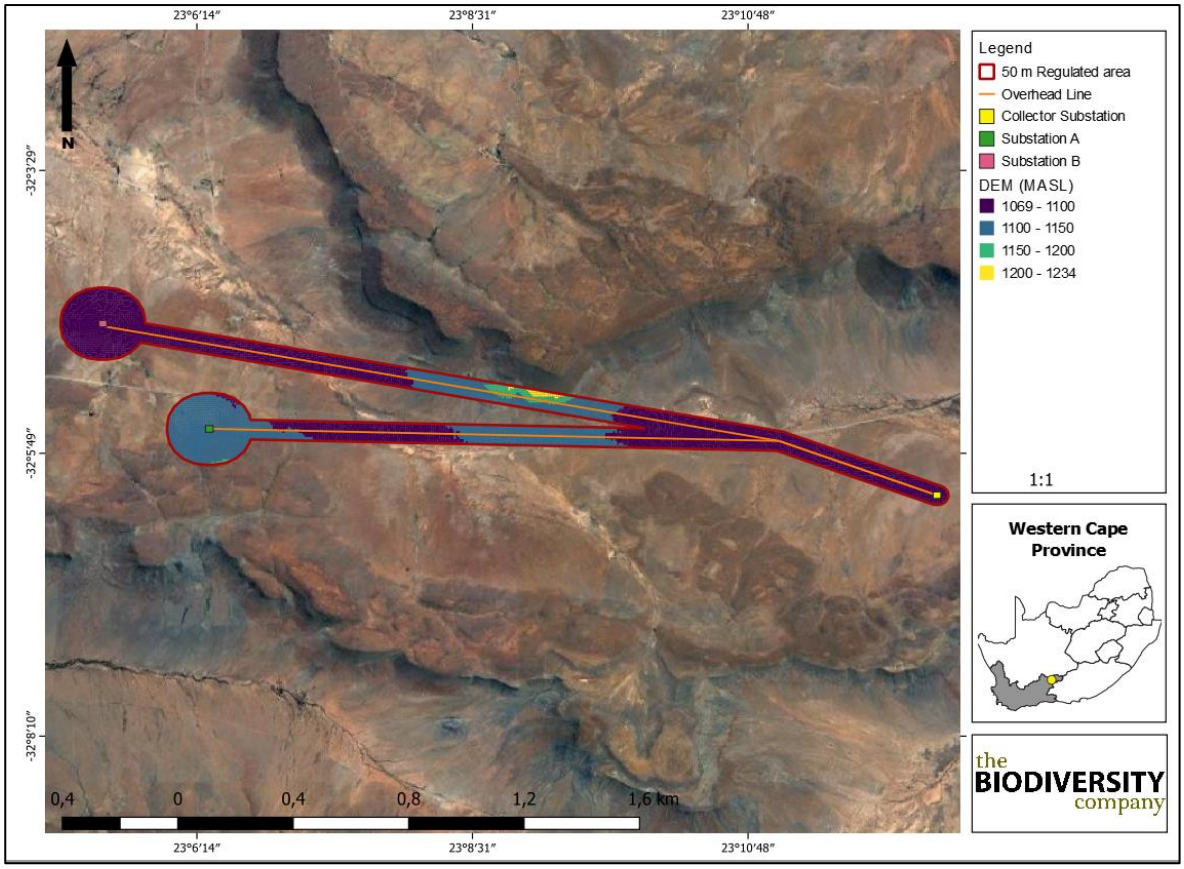


Figure 6.5 The DEM generated for the project area

6.4.2 Geology, Soils and Land Type

According to the land type database (Land Type Survey Staff, 1972 - 2006), the project area is characterised by the Ae 76 and Ib 258 land types. The Ae and Ib land types are characterised with Hutton, Oakleaf and Glenrosa soil forms which are red-yellow apedal and freely drained soils according to the Soil Classification Working Group, (1991) with the possibility of other soils and bare rocky areas also occurring within the terrain. Deeper red mesotrophic and eutrophic soils high in base status also occur in the area, associated with shallow and rocky profiles in the upper terrains. Lime is mostly absent in the upper areas and can occur in the lower areas. The Ib land type is also characterised with miscellaneous land class and soils. The land terrain units for the featured Ae 76 land type are illustrated in Figure 6.6 with the expected soils listed in Table 6.2 and Ib 258 land types in Figure 6.7 and Table 6.3.

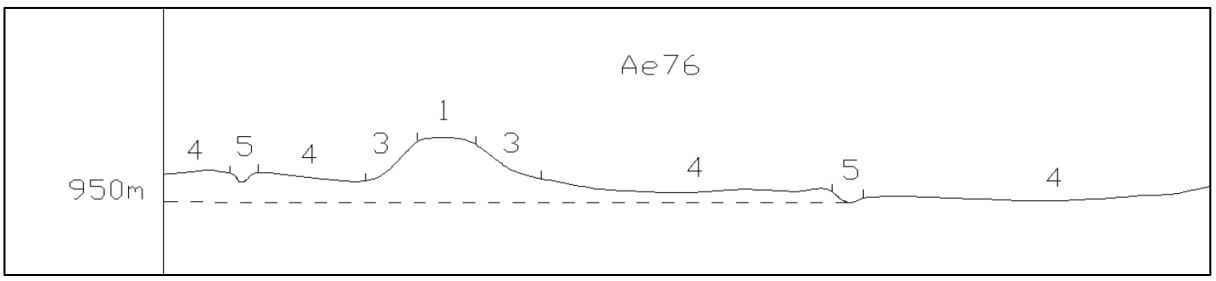


Figure 6.6 Illustration of land type Ae 76 terrain unit (Land Type Survey Staff, 1972 - 2006)

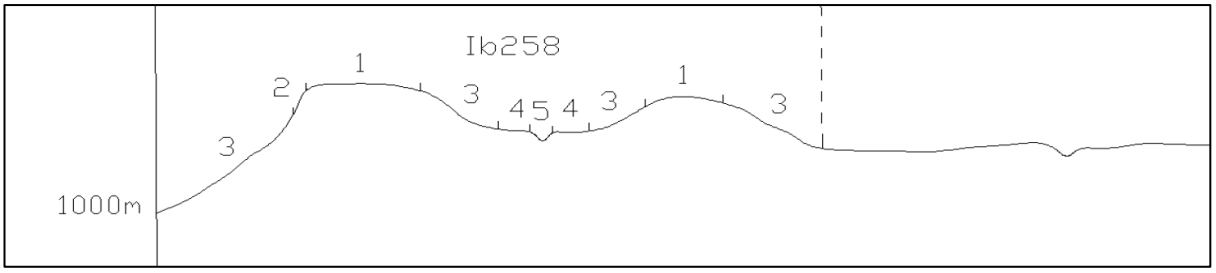


Figure 6.7 Illustration of land type Ib 258 terrain unit (Land Type Survey Staff, 1972 - 2006)

Table 6.2: Soils expected at the respective terrain units within the Ae 76 land type (Land Type Survey Staff, 1972 - 2006)

Terrain Units							
1 (3%)		**3 (2%)**		**4 (75%)**		**5(20%)**	
Bare Rocks	35%	Glenrosa	40%	Hutton	60%	Oakleaf	60%
Mispah	35%	Bare Rocks	25%	Glenrosa	10%	Dundee	15%
Glenrosa	30%	Mispah	25%	Mispah	10%	Hutton	10%
		Hutton	10%	Swartland	10%	Valsrivier	10%
				Bare Rocks	5%	Bare Rocks	5%
				Valsrivier	2%		

Table 6.3: Soils expected at the respective terrain units within the Ib 258 land type (Land Type Survey Staff, 1972 - 2006)

Terrain Units									
1 (10%)		**2 (1%)**		**3 (75%)**		**4 (9%)**		**5(5%)**	
Bare Rocks	65%	Bare Rocks	100%	Bare Rocks	70%	Bare Rocks	50%	Oakleaf	70%
Glenrosa	15%			Hutton	15%	Hutton	20%	Dundee	20%
Shortlands	10%			Mispah	5%	Glenrosa	10%	Bare Rocks	5%
Hutton	5%			Glenrosa	5%	Shortlands	10%	Shortlands	5%
Mispah	5%			Shortlands	3%	Swartland	10%		
				Swartland	2%				

6.4.3 Land Capability and Land Potential of the Project Site

Given the nature of the compliance statement and the fact that baseline findings correlate with the screening tool's sensitivities, land capability was solely determined by means of the National Land Capability Evaluation Raster Data Layer (DAFF, 2017). Land capability and land potential will also briefly be calculated to match to that of the screening tool to ultimately determine the accuracy of the land capability sensitivity from (DAFF, 2017).

Land capability and agricultural potential will briefly be determined by a combination of soil, terrain and climate features. Land capability is defined by the most intensive long-term sustainable use of land under rain-fed conditions. At the same time an indication is given about the permanent limitations associated with the different land use classes.

Land capability is divided into eight classes, and these may be divided into three capability groups. Table 6.4 shows how the land classes and groups are arranged in order of decreasing capability and ranges of use. The risk of use increases from class I to class VIII (Smith, 2006).

Table 6.4: Land capability class and intensity of use (Smith, 2006)

Land Capability Class	Increased Intensity of Use									Land Capability Groups
I	W	F	LG	MG	IG	LC	MC	IC	VIC	Arable Land
II	W	F	LG	MG	IG	LC	MC	IC		
III	W	F	LG	MG	IG	LC	MC			
IV	W	F	LG	MG	IG	LC				
V	W	F	LG	MG						Grazing Land
VI	W	F	LG	MG						
VII	W	F	LG							
VIII	W									Wildlife
W - Wildlife		**MG - Moderate Grazing**			**MC - Moderate Cultivation**					
F- Forestry		**IG - Intensive Grazing**			**IC - Intensive Cultivation**					
LG - Light Grazing		**LC - Light Cultivation**			**VIC - Very Intensive Cultivation**					

The land potential classes are determined by combining the land capability results and the climate capability of a region as shown in Table 6.6. The final land potential results are then described in Table 6.5.

Table 6.5: The combination table for land potential classification

Land capability class	Climate capability class							
	C1	C2	C3	C4	C5	C6	C7	C8
I	L1	L1	L2	L2	L3	L3	L4	L4
II	L1	L2	L2	L3	L3	L4	L4	L5
III	L2	L2	L3	L3	L4	L4	L5	L6
IV	L2	L3	L3	L4	L4	L5	L5	L6
V	Vlei	Vlei	Vlei	Vlei	Vlei	Vlei	Vlei	Vlei
VI	L4	L4	L5	L5	L5	L6	L6	L7
VII	L5	L5	L6	L6	L7	L7	L7	L8
VIII	L6	L6	L7	L7	L8	L8	L8	L8

Table 6.6: The Land Potential Classes

Land potential	Description of land potential class
L1	Very high potential: No limitations. Appropriate contour protection must be implemented and inspected.
L2	High potential: Very infrequent and/or minor limitations due to soil, slope, temperatures or rainfall. Appropriate contour protection must be implemented and inspected.
L3	Good potential: Infrequent and/or moderate limitations due to soil, slope, temperatures or rainfall. Appropriate contour protection must be implemented and inspected.
L4	Moderate potential: Moderately regular and/or severe to moderate limitations due to soil, slope, temperatures or rainfall. Appropriate permission is required before ploughing virgin land.

L5	Restricted potential: Regular and/or severe to moderate limitations due to soil, slope, temperatures or rainfall.
L6	Very restricted potential: Regular and/or severe limitations due to soil, slope, temperatures or rainfall. Non-arable
L7	Low potential: Severe limitations due to soil, slope, temperatures or rainfall. Non-arable
L8	Very low potential: Very severe limitations due to soil, slope, temperatures or rainfall. Non-arable

6.4.4 Land Use

The proposed Poortjies WES Renewable Solar project is located in the Beaufort West Local Municipality in the central karoo district within the Western Cape Province. The project is located approximately 12 km south-east of the town of Nelspoot at the foot of the Nuweveld Mountains and the old N1 road. The project area is also 29 km south of the Three Siters town. The surrounding land use includes game reserves and agricultural activities predominantly livestock production.

6.4.5 Ecological Profile of the Study Area and Development Area

The GIS analysis pertaining to the relevance of the proposed development to ecologically important landscape features are summarised in table 6.7.

Table 6.7: Summary of relevance of the proposed project to ecologically important landscape features (refer to Appendix D of the Specialist Ecology Report).

Ecological Feature	Relevance	Section
Ecosystem Threat Status	Irrelevant – Overlaps with Least Concern ecosystems	0
Ecosystem Protection Level	Relevant – Overlaps with Poorly Protected ecosystems	0
Protected Areas	Irrelevant – Located approximately 40 km north-east from the Steenbokkie Private Nature Reserve	0
National Protected Areas Expansion Strategy	Irrelevant – Does not overlap a NPAES focus area	0
Western Cape Biodiversity Spatial Plan	Relevant – Overlaps Ecological Support Area 1 and marginally overlaps Critical Biodiversity Area 1	**Error! Reference source not found.**
Hydrological Context	Relevant – Critically Endangered and Endangered ephemeral system traverses the PAOI	0

Ecosystem Threat Status

The Ecosystem Threat Status is an indicator of an ecosystem's wellbeing, based on the level of change in structure, function or composition. Ecosystem types are categorised as Critically Endangered (CR), Endangered (EN), Vulnerable (VU), Near Threatened (NT) or Least Concern (LC), based on the proportion of the original extent of each ecosystem type that remains in good ecological condition. According to the spatial dataset the PAOI overlaps with LC ecosystems (Figure 6.8).

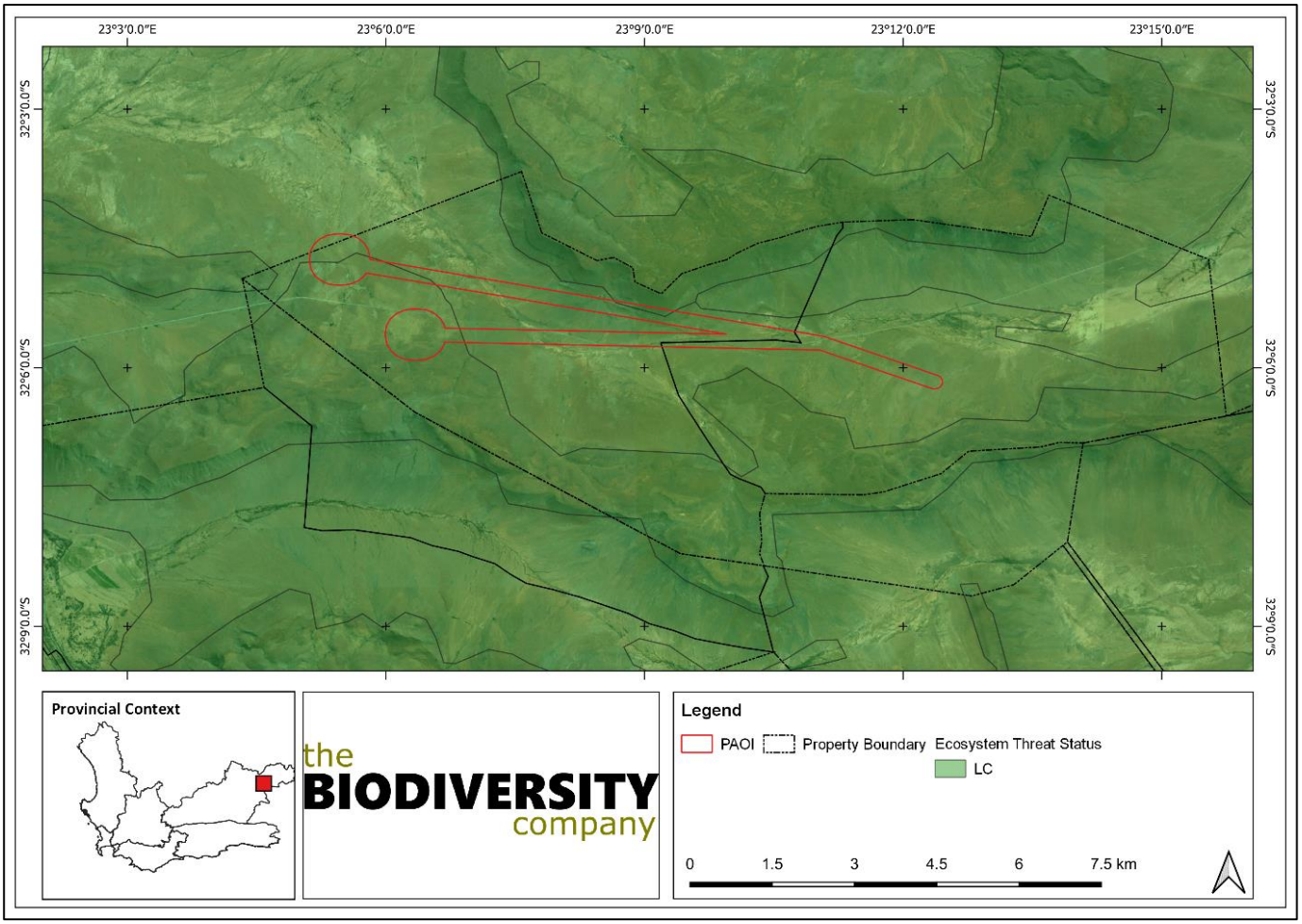


Figure 6.8 Map illustrating the ecosystem threat status associated with the proposed Poortjie Wes Grid Connection Infrastructure PAOI

Ecosystem Protection Level

Indicator of the extent to which ecosystems are adequately protected or under-protected. Ecosystem types are categorised as Well Protected (WP), Moderately Protected (MP), Poorly Protected (PP), or Not Protected (NP), based on the proportion of the biodiversity target for each ecosystem type that is included within one or more protected areas. Not Protected, Poorly Protected or Moderately Protected ecosystem types are collectively referred to as under-protected ecosystems. The PAOI overlaps with a PP ecosystem (Figure 6.9).

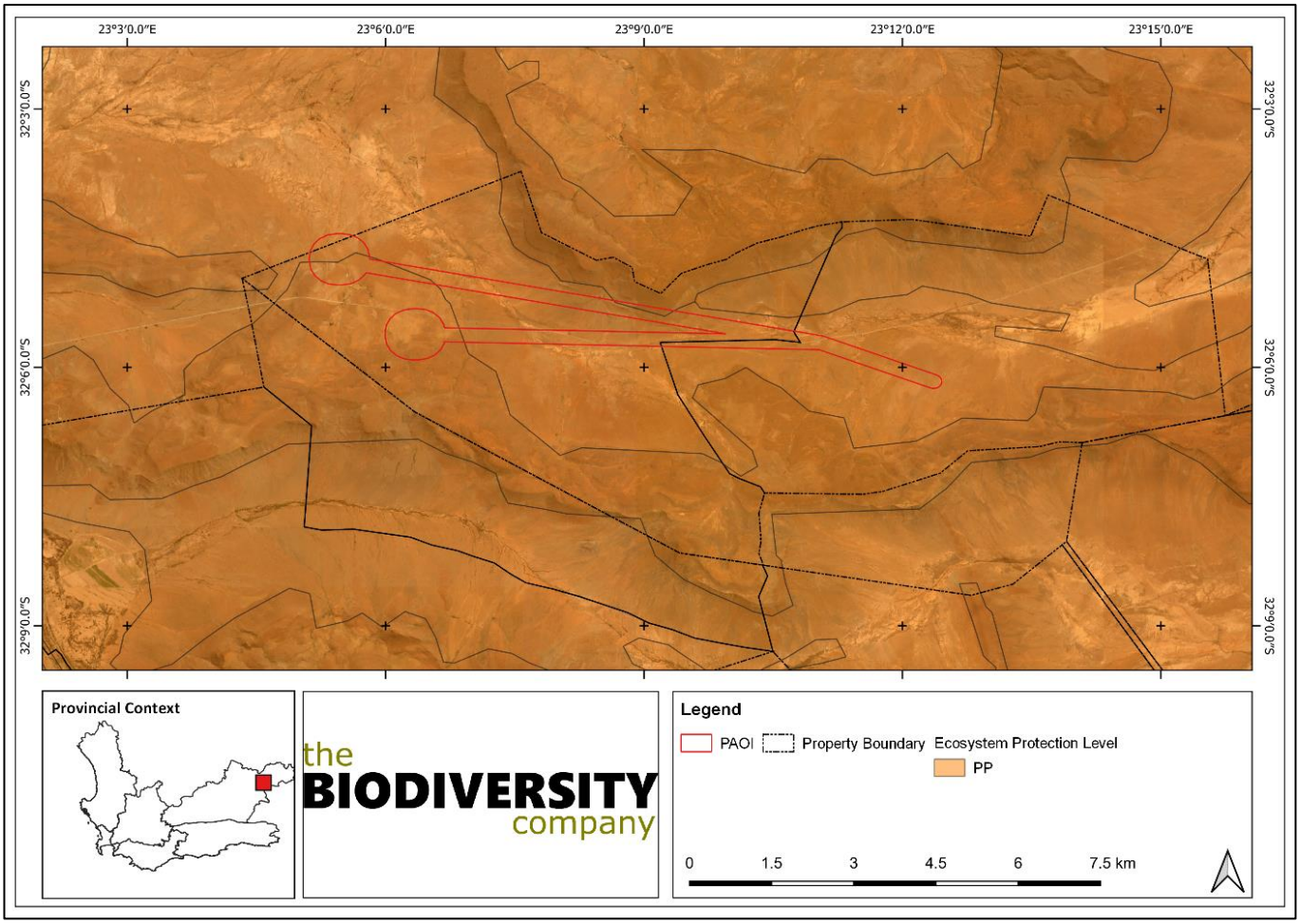


Figure 6.9 Map illustrating the ecosystem protection level associated with the proposed Poortjie Wes Grid Connection Infrastructure PAOI

Protected Areas

According to the SAPAD dataset, the proposed development area does not occur within any protected area. The Steenbokkie Private Nature Reserve is located approximately 40 km to the south-west. The proposed activity is unlikely to influence surrounding protected areas as they are situated outside of the buffer zone required to maintain the functioning of these protected areas. In addition, the PAOI does not overlap an NPAES focus areas nor is there one within the immediate surrounding landscape (Figure 6.10). The Karoo Escarpment Grassland Focus Area is located approximately 23 km to the north and the Upper Karoo Focus Area is located approximately 36 km to the south-west.

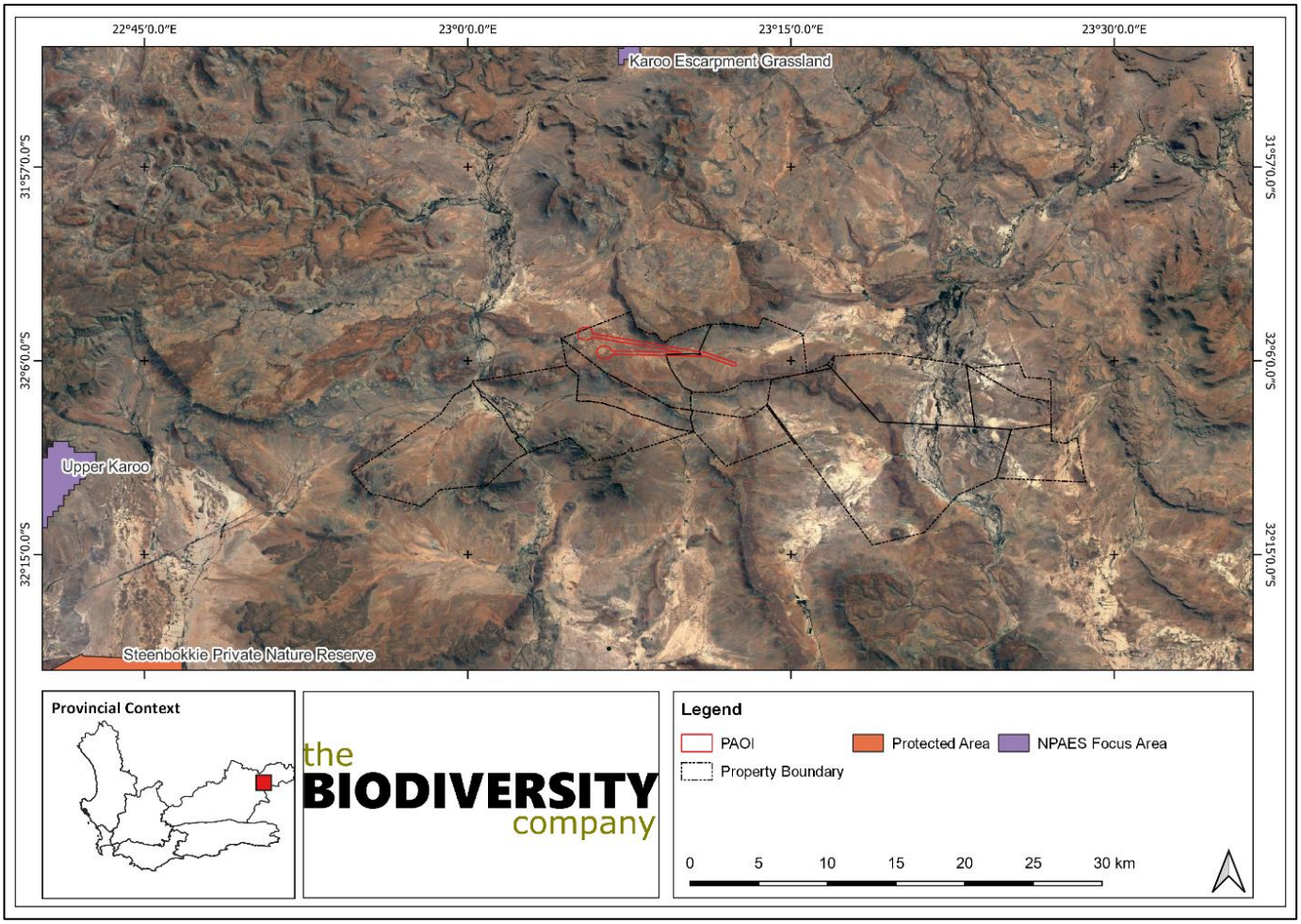


Figure 6.10 Map illustrating the location of protected areas proximal to the proposed Poortjie Wes Grid Connection Infrastructure PAOI

Western Cape Biodiversity Spatial Plan

Figure 6.11 illustrates that the proposed development overlaps with Ecological Support Areas 1 and 2, Other Natural Area and marginally with a CBA1.

ESA1 features are important in supporting the functioning of Protected Areas or Critical Biodiversity Areas and are often vital for ecosystem services. These ESAs must be maintained in a functional, near-natural state. Some habitat loss is acceptable, provided underlying biodiversity objectives/ecological functioning are not compromised (CapeNature, 2017). The ESA associated with the PAOI was defined as such due to watercourse protection.

ONAs retain most of their natural character and perform biodiversity and ecological infrastructure functions but have not been prioritised in the current Western Cape Biodiversity Spatial Plan.

CBAs are critically required in order to meet biodiversity pattern and process thresholds. CBAs are areas of high biodiversity and ecological value and need to be kept in a natural or near-natural state, with no further loss of habitat or species. Degraded areas should be rehabilitated to natural or near-natural condition. Only low-impact, biodiversity-sensitive land uses are appropriate (CapeNature, 2017).

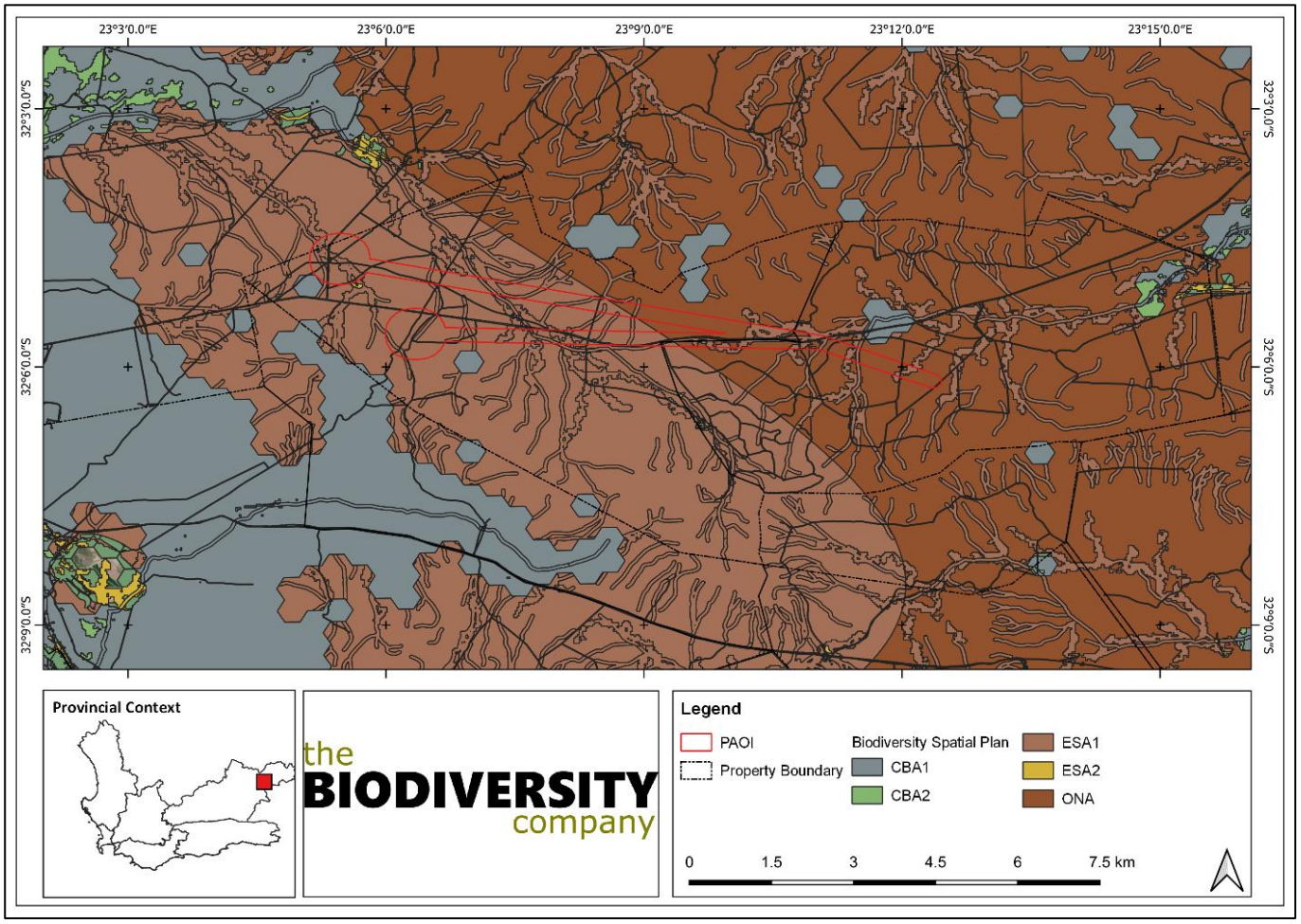


Figure 6.11 Map illustrating the proposed Poortjie Wes Grid Connection Infrastructure PAOI overlaid onto the Western Cape Biodiversity Spatial Plan

Hydrological Context

The PAOI is located within the Sout River and Kariega River Catchments, specifically quaternary catchment L11C and L22A, respectively. Topographical spatial data indicated that there are ephemeral drainage lines traversing the PAOI.

The South African Inventory of Inland Aquatic Ecosystems (SAIIAE) was released with the National Biodiversity Assessment (NBA) 2018. Ecosystem threat status (ETS) of ecosystem types is based on the extent to which each river ecosystem type had been altered from its natural condition. Ecosystem types are categorised as CR, EN, VU or LT. Critically Endangered, EN and VU ecosystem types collectively referred to as 'threatened' (Van Deventer *et al.,* 2019; Skowno *et al.,* 2019). Two of the ephemeral systems traversing the PAOI were assessed as part of the SAIIAE. The unnamed tributary of the Sout River draining in a north-west trajectory is classified as EN (Figure 6.12). The unnamed tributary of the Kariega River draining in a north-east trajectory is classified as CR (Figure 6.12).

The National Freshwater Ecosystem Priority Areas (NFEPAs) (Driver *et al*., 2011) spatial data has been incorporated in the above mentioned SAIIAE spatial data set. They are included here as the database is intended to be conservation support tools and are envisioned to guide the effective implementation of measures to achieve the National Environment Management Biodiversity Act (NEM:BA) biodiversity goals

(Nel *et al.,* 2011). The NFEPA spatial layer indicates that neither the EN unnamed tributary, nor the Sout River, are regarded as FEPAs. The unnamed tributary of the Kariega River, as well as the Kariega River itself, are categorised as Upstream Management Areas. Any negative impacts to these systems arising from the proposed development will potentially lead to negative alterations of water provisioning services.

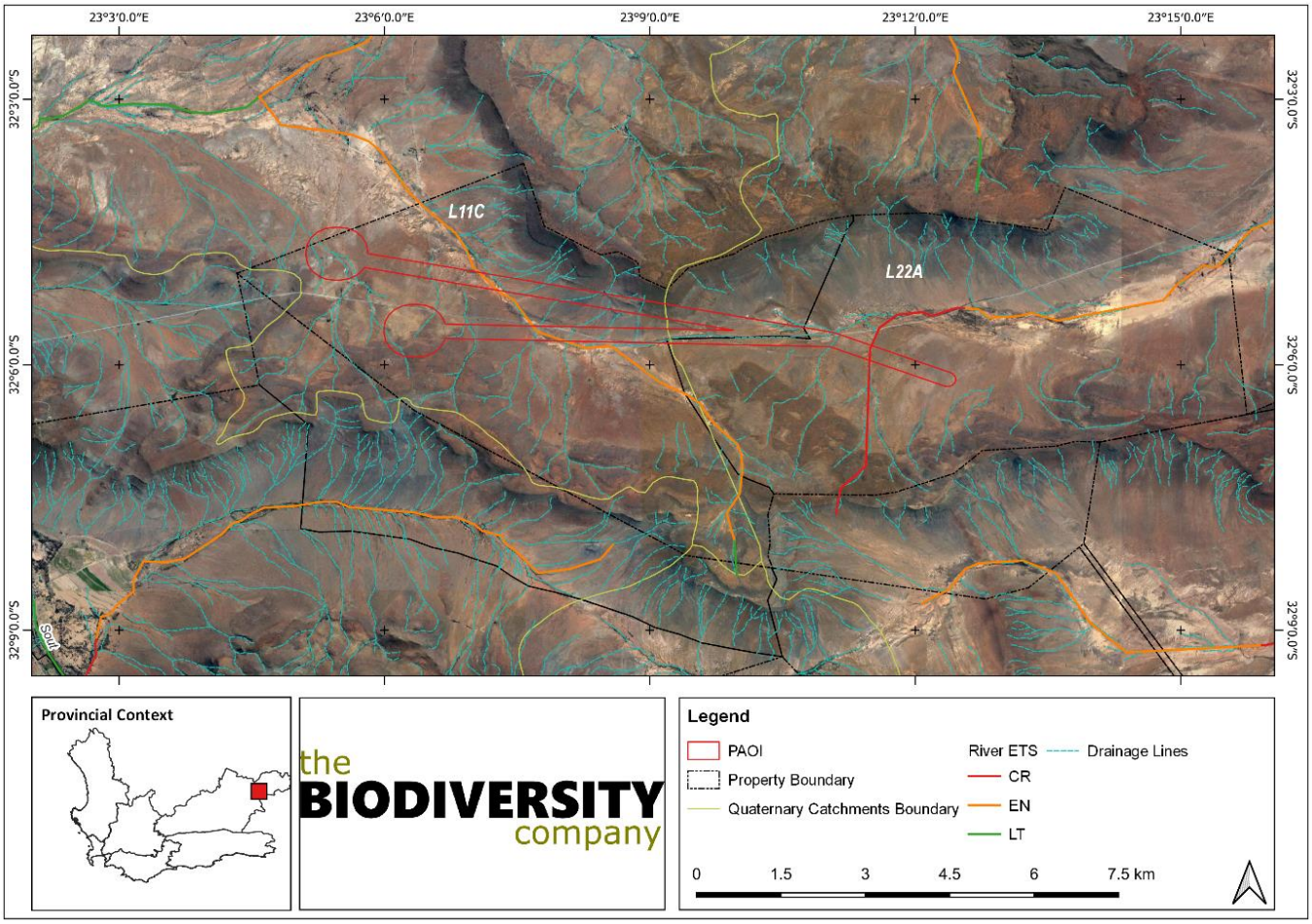


Figure 6.12 Map illustrating the hydrological context of the proposed Poortjie Wes Grid Connection Infrastructure PAOI

Flora Assessment

This section is divided into a description of the vegetation type expected under natural conditions and the expected flora species.

Vegetation Type

The project area is located within the Nama Karoo Biome, which is a large, landlocked region on the central plateau of the western half of South Africa and extends into south-eastern Namibia. This is an arid biome with majority of the river systems being non-perennial. Apart from the Orange River and the few permanent streams in the southwest that originate in higher-rainfall neighbouring areas, the limited number of perennial streams that originate in the Nama-Karoo are restricted to the more mesic east. The low precipitation is unreliable (coefficient of variation of annual rainfall up to 40%) and droughts are unpredictable and prolonged. The unpredictable rainfall impedes the dominance of leaf succulents and is too dry in summer for dominance by perennial grasses alone, and the soils are generally too shallow, and the rainfall is too low for trees. Unlike other biomes of southern Africa, local endemism is very low and consequently, the Nama-

Karoo Biome does not contain any centre of endemism. Despite relatively low floristic diversity, the Nama-Karoo vegetation has a high diversity of plant life forms. These include co-occurring ephemerals, annuals, geophytes, C3 and C4 grasses, succulents, deciduous and evergreen chamaephytes and trees. This is probably a consequence of an ecotonal and climatically unstable nature of the region.
On a fine-scale vegetation type, the PAOI overlaps two vegetation types, namely the Gamka Karoo and Upper Karoo Hardeveld (Figure 6.13).

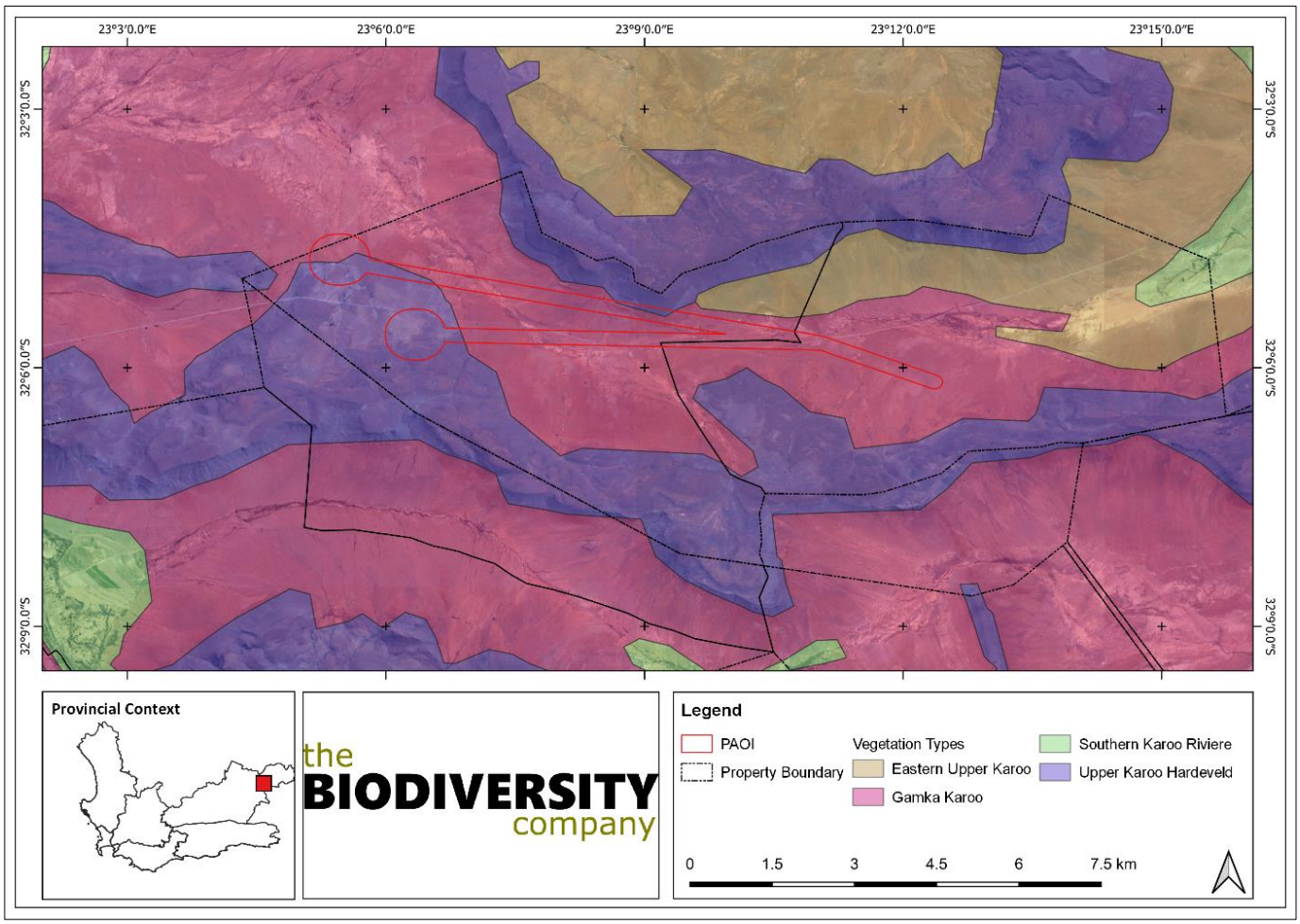


Figure 6.13 Map illustrating the vegetation types within the proposed Poortjie Wes Grid Connection Infrastructure PAOI

The Gamka Karoo vegetation type is described as follows:

I. Topography – Extremely irregular to slightly undulating plains dominated by dwarf spiny shrubs.
II. Geology & Soils – Mudstones and sandstones of the Beaufort Group (Adelaide Subgroup) with some Ecca (Fort Brown Formation) shales supporting very shallow and stony soils of the Glenrosa and/or Mispah forms.
III. Important Taxa - Tall Shrubs: *Lycium cinereum, L. oxycarpum, Rhigozum obovatum, Vachellia karroo, Cadaba aphylla, Lycium schizocalyx, Searsia burchellii, Sisyndite spartea*. Low Shrubs: *Chrysocoma ciliata, Eriocephalus ericoides subsp. ericoides , E. spinescens , Felicia muricata , Galenia fruticosa , Limeum aethiopicum, Pentzia incana, Pteronia adenocarpa, Rosenia humilis, Aptosimum indivisum, Asparagus burchellii, Blepharis mitrata, Eriocephalus microphyllus var. pubescens, Felicia filifolia subsp. filifolia, F. muricata subsp. cinerascens, Galenia secunda, Garuleum bipinnatum, G. latifolium, Gomphocarpus filiformis, Helichrysum lucilioides, Hermannia desertorum, H. grandiflora, H. spinosa,*

Melolobium candicans, Microloma armatum, Monechma spartioides, Pentzia pinnatisecta, Plinthus karooicus, Polygala seminuda, Pteronia glauca, P. sordida, P. viscosa, Selago geniculata, Sericocoma avolans, Zygophyllum microcarpum, Z. microphyllum. Succulent Shrubs: *Ruschia intricata, Aridaria noctiflora subsp. straminea, Crassula muscosa, Drosanthemum lique, Galenia sarcophylla, Kleinia longiflora, Ruschia spinosa, Salsola tuberculata, Sarcocaulon patersonii, Trichodiadema barbatum, Tripteris sinuata var. linearis*. Semi-parasitic Shrub: *Thesium lineatum*. Herbs: *Gazania lichtensteinii, Chamaesyce inaequilatera, Dicoma capensis, Galenia glandulifera, Lepidium africanum subsp. africanum, L. desertorum, Lessertia pauciflora var. pauciflora, Leysera tenella, Osteospermum microphyllum, Sesamum capense, Tetragonia microptera, Tribulus terrestris, Ursinia nana*. Geophytic Herbs: *Drimia intricata, Moraea polystachya.* Graminoids: *Aristida congesta, A. diffusa, Fingerhuthia africana, Stipagrostis ciliata, S. obtusa, Aristida adscensionis, Cenchrus ciliaris, Digitaria argyrograpta, Enneapogon desvauxii, Enneapogon scaber, Eragrostis homomalla, E. lehmanniana, E. obtusa, Tragus berteronianus, T. koelerioides*.

IV. Biogeographically Important Taxa – Succulent Shrubs: *Hereroa latipetala, H. odorata, Pleiospilos compactus, Rhinephyllum luteum, Stapelia engleriana*. Geophytic Herb: *Tritonia tugwelliae*. Low Shrub: *Felicia lasiocarpa*. Succulent Herbs: *Piaranthus comptus, Tridentea parvipuncta subsp. parvipuncta*. Graminoid: *Oropetium capense*.

V. Endemic Taxa – Succulent Shrubs: *Chasmatophyllum stanleyi, Hereroa incurva, Hoodia dregei, Ruschia beaufortensis*. Low Shrubs: *Jamesbrittenia tenuifolia*. Herb: *Manulea karrooica*. Succulent Herb: *Piaranthus comptus*.

VI. Conservation – About 2% statutorily conserved in the Karoo National Park and some in private reserves, such as Steenbokkie Private Nature Reserve (near Beaufort West). The alien *Salsola kali* is a serious infestation problem in certain areas. Erosion varies from low to high depending on location.

The Upper Karoo Hardeveld is described as follows:

I. Topography – Steep slopes of koppies, butts, mesas and parts of the Great Escarpment covered with large boulders and stones.

II. Geology & Soils – Primitive, skeletal soils in rocky areas developing over sedimentary rocks such as mudstones and arenites of the Adelaide Subgroup of the Karoo Supergroup and to a lesser extent also the Ecca Group (Waterford and Volksrust Formations) as well as Jurassic dolerite sills and dykes and sub-summit positions of mesas and butts with dolerite boulder slopes.

III. Important Taxa - Tall Shrubs: *Lycium cinereum, Rhigozum obovatum, Cadaba aphylla, Diospyros austro-africana, Ehretia rigida subsp. rigida, Lycium oxycarpum, Melianthus comosus, Searsia burchellii.* Low Shrubs: *Chrysocoma ciliata , Eriocephalus ericoides subsp. ericoides , Euryops lateriflorus, Felicia muricata , Limeum aethiopicum , Pteronia glauca , Amphiglossa triflora, Aptosimum elongatum, A. spinescens, Asparagus mucronatus, A. retrofractus, A. striatus, A. suaveolens, Eriocephalus spinescens, Euryops annae, E. candollei, E. empetrifolium, E. nodosus, Felicia filifolia subsp. filifolia, Garuleum latifolium, Helichrysum lucilioides, H. zeyheri, Hermannia filifolia var. filifolia, H. multiflora, H. pulchella, H. vestita, Indigofera sessilifolia, Jamesbrittenia atropurpurea, Lessertia frutescens, Melolobium candicans, M. microphyllum, Microloma armatum, Monechma incanum, Nenax microphylla, Pegolettia retrofracta, Pelargonium abrotanifolium, P. ramosissimum, Pentzia globosa, P. spinescens, Plinthus karooicus, Polygala seminuda, Pteronia adenocarpa, P. sordida, Rosenia humilis, Selago albida, Solanum capense, Sutera halimifolia, Tetragonia arbuscula, Wahlenbergia tenella*. Succulent Shrubs: *Aloe broomii, Drosanthemum lique, Faucaria bosscheana, Kleinia longiflora, Pachypodium succulentum, Trichodiadema barbatum, Zygophyllum flexuosum*. Semi-parasitic Shrub: *Thesium lineatum*. Herbs: *Troglophyton capillaceum subsp. capillaceum, Dianthus caespitosus subsp. caespitosus, Gazania krebsiana, Lepidium africanum subsp. africanum,*

Leysera tenella, Pelargonium minimum, Sutera pinnatifida, Tribulus terrestris. Geophytic Herbs: *Albuca setosa, Androcymbium albomarginatum, Asplenium cordatum, Boophone disticha, Cheilanthes bergiana, Drimia intricata, Oxalis depressa*. Graminoids: *Aristida adscensionis, A. congesta, A. diffusa, Cenchrus ciliaris, Enneapogon desvauxii, Eragrostis lehmanniana, E. obtusa, Sporobolus fimbriatus, Stipagrostis obtusa, Cynodon incompletus, Digitaria eriantha, Ehrharta calycina, Enneapogon scaber, E. scoparius, Eragrostis curvula, E. nindensis, E. procumbens, Fingerhuthia africana, Heteropogon contortus, Merxmuellera disticha, Stipagrostis ciliata, Themeda triandra, Tragus berteronianus, T. koelerioides*.

IV. Endemic Taxa – Succulent Shrubs: *Aloe chlorantha, Crassula barbata subsp. broomii, Delosperma robustum, Sceletium expansum, Stomatium suaveolens*. Low Shrubs: *Cineraria polycephala, Euryops petraeus, Lotononis azureoides, Selago magnakarooica*. Tall Shrub: *Anisodontea malvastroides*. Herbs: *Cineraria arctotidea, Vellereophyton niveum*. Succulent Herbs: *Adromischus fallax, A. humilis*. Geophytic Herbs: *Gethyllis longistyla, Lachenalia auriolae*, *Ornithogalum paucifolium subsp. karooparkense*.

V. Conservation – Only about 3% statutorily conserved in Karoo National Park and Karoo Nature Reserve. Small percentage also protected in private reserves such as Rupert Game Farm. Erosion is moderate and high.

Expected Flora Species of Conservation Concern

Based on the POSA database and the Environmental Screening Tool five threatened floral species are expected to occur within the POAI and surrounding landscape (Table 6.8).

Table 6.8: Threatened flora species that are expected to occur within the Poortjie Wes Grid Connection Infrastructure PAOI. VU = Vulnerable

Family	Species Name	Conservation Status	Endemism	Habitat	Likelihood of Occurrence
Aizoaceae	*Hereroa concava*	VU	Endemic	Plants occur sheltered among shrubs on flats and plateaus with shale outcrops.	Low
Aizoaceae	*Peersia frithii*	VU	Endemic	Slopes or flats of finely weathered Ecca shales.	Low
Apocynaceae	*Tridentea virescens*	Rare		Stony ground, or hard loam in floodplains.	Low
Bruniaceae	*Audouinia esterhuyseniae*	VU	Endemic	Shale soil on south-facing slopes below sandstone cliffs. A rare montane resprouter known from only two locations.	Low
Malvaceae	*Anisodontea malvastroides*	Rare	Endemic	It occurs in arid grassland on summit plateaus and escarpments. Locally abundant on cliffs or summit plateaus.	Low

Fauna Assessment

This section provides the list of threatened species expected to occur within the project area. N.B. the likelihood of occurrence that is provided refers to the development footprints and not the surrounding landscape.

Expected Amphibian Species of Conservation Concern

Based on the IUCN Red List Spatial Data and the FrogMAP database, six amphibian species are expected to occur within the area with none of these expected species regarded as threatened (Appendix D).

Expected Reptile Species of Conservation Concern

Based on the IUCN Red List Spatial Data and the ReptileMAP database, 27 reptile species are expected to occur within the PAOI and surrounding landscape with one of these species regarded as threatened (Appendix D).

Table 6.9: Reptile species of conservation concern that are expected to occur within the Poortjie Wes Grid Connection Infrastructure PAOI. NT= Near Threatened

Family	Scientific Name	Common Name	Conservation Status		Likelihood of Occurrence
			Regional	Global	
Testudinae	*Chersobius boulengeri*	Karoo Dwarf Tortoise	EN	EN	Low
Testudinae	*Psammobates tentorius tentorius*	Tent Tortoise	NT	NT	High

Expected Mammal Species of Conservation Concern

The IUCN Red List Spatial Data and MammalMAP database lists eight non-volant mammal species of conservation concern that could be expected to occur within the PAOI (Table 6.10). This list excludes larger mammal species that are generally restricted to protected areas.

Table 6.10: Mammal species of conservation concern that are expected to occur within the Poortjie Wes Grid Connection Infrastructure PAOI. CR = Critically Endangered, LC = Least Concern, NT= Near Threatened and VU = Vulnerable

Family	Scientific Name	Common Name	Conservation Status		Likelihood of Occurrence
			Regional	Global	
Felidae	*Felis nigripes*	Black-footed Cat	VU	VU	Low
Felidae	*Leptailurus serval serval*	Southern Serval	NT	LC	Low
Felidae	*Panthera pardus*	Leopard	VU	VU	Low
Gliridae	*Graphiurus ocularis*	Spectacled Dormouse	NT	LC	Low
Hyaenidae	*Parahyaena brunnea*	Brown Hyaena	NT	NT	Low
Leporidae	*Bunolagus monticularis*	Riverine Rabbit	CR	CR	Low
Muridae	*Parotomys littledalei*	Littledale's Whistling Rat	NT	LC	High
Mustelidae	*Aonyx capensis*	Cape Clawless Otter	NT	NT	Low

6.5 Heritage Profile (including Palaeontology)

The landscape of the development area has been assessed for cultural heritage significance, with six distinct character areas identified. Each character area lends itself to a different carrying capacity in terms of landscape altering infrastructure development.

6.5.1 Archaeology

A small portion of the proposed grid connection falls within an area of high sensitivity on the elevated ridge containing the dolerite boulder engravings and the stone kraal. These sites falling in the sensitivity area have associated higher density and *in situ* artefact scatters. The engravings show a range of well-preserved imagery linking the ethnographic records of the San in the Bleek and Lloyd collection to these sites such as the scene depicted showing a cloudburst of rain, finely engraved eland and elephant. Accordingly, a

sensitivity overlay zone has been developed where development should be avoided. However, no significant archaeological resources were identified in the footprints of the proposed grid infrastructure.

The impact of the proposed grid connection on identified archaeological resources will not be substantial and will have an overall negligible change on the archaeological sensitivity of the Nelspoort area. The majority of the lithic material identified is of low significance (not conservation-worthy), and even though the resources may be destroyed during construction, the impact is inconsequential. No mitigation is required for archaeological material recorded in the footprint of the proposed grid connection

Despite the high number of observations of artefacts, these resources are common and representative of similar scatters across widespread areas of the Karoo. Despite the very high numbers of observations made, the archaeological material is ubiquitous across the entire area and in general, the results of this assessment indicate that the archaeological sensitivity of the development area is low within the area proposed for the grid connection..

6.5.2 Palaeontology

The area proposed for development is underlain by potentially fossiliferous sedimentary rocks of the Teekloof Formation (Lower Beaufort Group, Karoo Supergroup) of Late Permian age. While a sparse scatter of previously recorded vertebrate fossil sites are known in the wider region, it is not known if any of these fall within the solar project sites currently under consideration. Based on the recent 3-day palaeontological site visit, the great majority of the solar project areas is mantled by thick superficial deposits (alluvium, colluvium / eluvium, calcrete, soils) of low palaeosensitivity. Apart from occasional invertebrate trace fossils of limited scientific interest, the small number of tetrapod fossils recorded from Lower Beaufort Group bedrocks here comprise reworked, fragmentary bones preserved within channel basal breccias or weathered-out into surface gravels. No well-preserved, articulated postcrania or identifiable skull material of high scientific or conservation significance was recorded, although there is still potential for such material occurring at or beneath the surface within the sites. It is concluded that all six solar site options are in practice of Low Palaeosensitivity overall. The preliminary Low to Very High palaeosensitivity sensitivity mapped here by the DFFE Screening Tool is therefore *contested*.

6.5.3 Cultural Landscapes

The proposed grid connection falls within the Nelspoort Murraysberg Valley Landscape Character Area. For this Landscape Character Area, it is recommended that a 250m buffer be implemented around the Waayfontein Ridgeline to conserve the integrity of the contribution of this distinctive ridge to the valley. Furthermore, the position of the proposed development immediately adjacent to an historic linkage route will detract from the significant sense of place within this valley.

The landscape character of the northern escarpment is particularly striking, imposing and distinctive. It is also very accessible to the public, and dominates that portion of the Nelspoort-Murraysburg linkage route. To avoid visual clutter and the sense of overwhelming the landscape experience with infrastructure, ideally:

1. Grid and other infrastructure should be concentrated to the south side of the road.
2. Grid connections should not follow both sides of the road simultaneously.
3. Grid road crossings should be concentrated to the west side, in the broader valley area, consolidating with the existing grid road crossings.

6.6 Visual Aspects

6.6.1 Potential Visual Exposure

The result of the viewshed analyses for the proposed Poortjie Wes Cluster Grid Connection infrastructure is shown on Figure 6.14 that follows. An analysis has been undertaken within the proposed development corridor in order to determine the general visual exposure (visibility) of the area under investigation. A generic height of 36m was used in order to illustrate the anticipated visual exposure of the proposed infrastructure (i.e. the maximum height of the power line structures). The visibility analysis for each alignment was generated from a number of points along the alignment, spaced at intervals of approximately 400m. Receptor height was set at eye level.

The height of the substations will not exceed two storeys (i.e. 6m), therefore the visual exposure of this component will fall within the viewshed generated for the power line alignment.

The viewshed analysis does not include the effect of vegetation cover or existing structures on the exposure of the proposed facility, therefore signifying a worst-case scenario.

Figure 6.14 indicates that the proposed grid connection infrastructure will be visually exposed to some extent within the study area, due to the tall power line infrastructure. It is thus anticipated that the infrastructure would be visible to observers (i.e. people travelling along roads, residing in homesteads or visiting the region), and could potentially constitute a high visual prominence, potentially resulting in a visual impact.

The following is an overview of the findings of the viewshed based on the layout illustrated on the Map provided:

- The potential visual exposure of the infrastructure is contained to a core area on the site itself and within a 0.5 km radius thereof.
- Sensitive visual receptors are observers travelling along the secondary road and residents of unknown dwellings/homesteads.
- Potential visual exposure in the short to medium distance (i.e. between 0.5 and 1.5km), is concentrated throughout this radius with small pockets of visually screened areas to the south west and north owing to the Bruinrug mountain.
- Sensitive visual receptors include residents of Hamelkuil and observers travelling along the secondary road
- In the medium to long distance (i.e. between 1.5 and 3km offset), the extent of potential visual exposure is reduced largely owing to the hilly and mountainous topography. Visually exposed areas are found to the north east, east, south, south west and north west with large areas to the north, south east, south west and west being visually screened.
- Sensitive visual receptors include residents of Bruinrug, as well as observers travelling along the secondary roads.
- Beyond the 3km offset from the proposed facility, potential visual exposure becomes extremely scattered and very low. Sensitive visual receptors are not likely to be visually exposed to the proposed facility, despite lying within the viewshed.

In general, as a result of the scattered and lower population density of the study area, the Poortjie Wes Cluster Grid Connection may constitute a visual prominence, potentially resulting in a moderate- low visual impact.

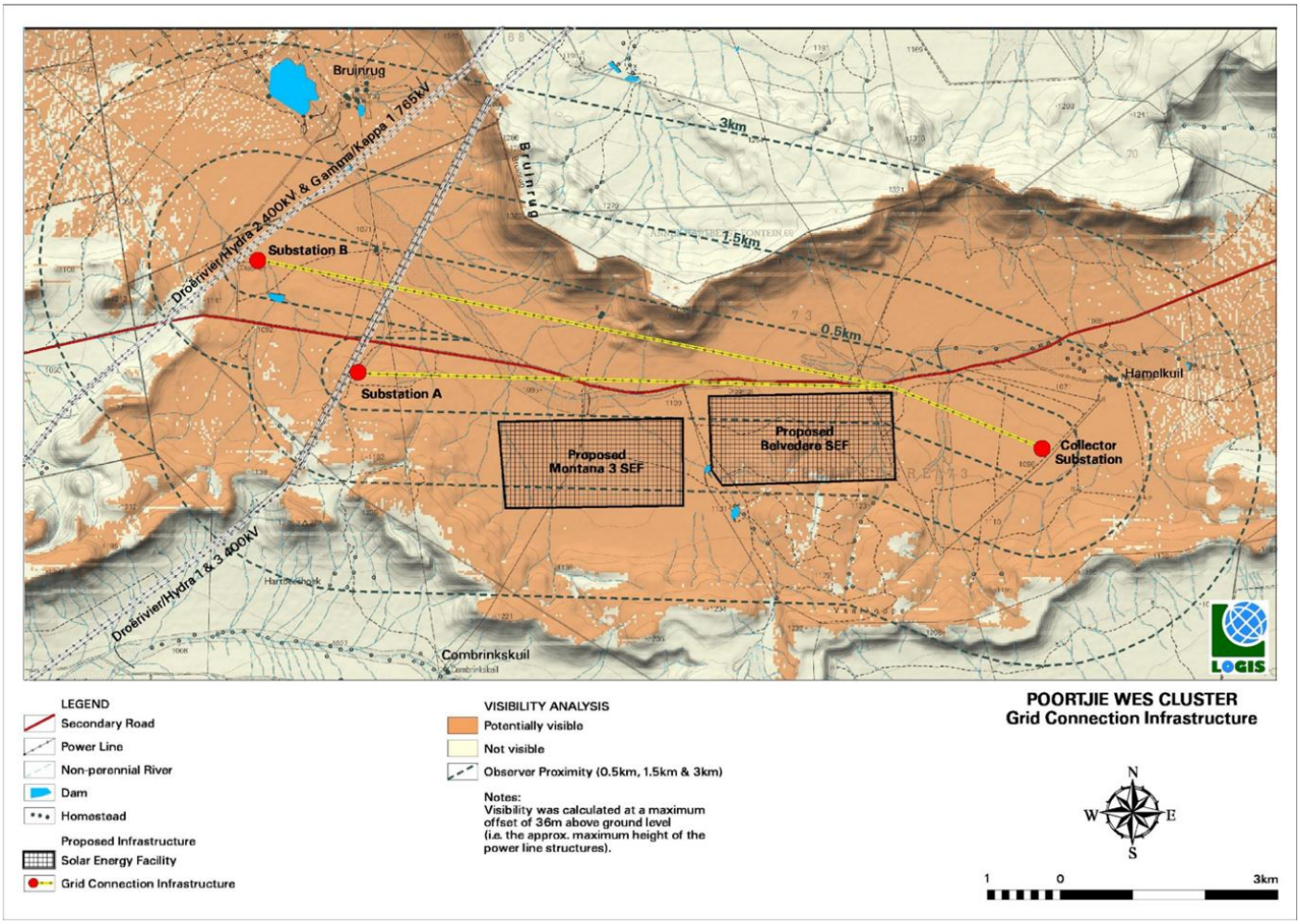


Figure 6.14 Viewshed analysis of the proposed 400kV MTS (Site 2)

6.6.2 *Potential Cumulative Visual Exposure*

There are already existing high voltage power lines that traverse the study area, namely the Droerivier/Hydra 2 400 kV and Gamma/Kappa 1 765 kV and the Droerivier/Hyrda 1&3 400 kV overhead lines. The addition of the proposed Poortjie Wes Cluster Grid Connection will result in an increase in this type of infrastructure within the region and could result in a cumulative visual impact.

6.6.3 *Visual Absorption Capacity*

The broader study area is located within the Nama-Karoo Biome, which is characterised by large open, *low shrubland*, grassland and bare soil in places.

Overall, the Visual Absorption Capacity (VAC) of the receiving environment is deemed low by virtue of the nature of the vegetation and the low occurrence of urban development. In addition, the scale and form of the proposed structures mean that it is unlikely that the environment will visually absorb them in terms of texture, colour, form and light/shade characteristics.

Where homesteads and settlements occur, some more significant vegetation and trees may have been planted, which would contribute to the visual absorption capacity (i.e., shielding the observers from the facility). As this is not a consistent occurrence, however, VAC will not be considered for any of the homesteads or settlements.

6.7 Socio-Economic Profile

6.7.1 Profile of the Broader Area

The population of the BWM in 2016 was 51 080. Of this total, 36.4% were under the age of 18, 56.7% were between 18 and 64, and the remaining 7% were 65 and older. The population of Ward 2 in 2011 was 6 975. Ward 2 is therefore a large, sparsely populated area with no large settlements. Of this total, 28.2% were under the age of 18, 64.9% were between 18 and 64, and the remaining 6.9% were 65 and older. The BWM has a relatively high percentage of people under the age of 18 and over the age of 65. This implies that a larger percentage of the population is dependent on the economically productive sector.

The dependency ratios for the BWM and Ward 2 were 76.5 (2016) and 54% (2011) respectively. The national dependency ratio in 2011 was 52.7%, while the Western Cape Province had the lowest provincial dependency level in South Africa, namely 45% in 2011. The municipal level is therefore significantly higher than the national and provincial level.

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

In terms of race groups, Coloureds made up 75.1% of the population on the BWM (2016), followed by Black Africans (17.7%) and Whites, 7%. In Ward 2 (2011), Coloureds made up 60.8%, followed by Whites (27%) and Black Africans (10.8%). The main first language spoken in the BWM and Ward 2 was Afrikaans (83% and 82.9% respectively), followed by isXhosa (13.1%) in the BWM and English (2.9%) in Ward 2.

Households and house types

There are a total number of 14 945 (2016) and 2 020 (2011) households in the BWM and Ward 2 respectively. Of these 99% (BWM) and 81.4% (Ward 2) were formal houses. Only 0.3% of structures in the BWM were shacks. The majority of dwellings in the BWM and Ward 2 are therefore formal structures. Approximately 39.8% of the households in the BWM and 24.2% of the households in Ward 2 were headed by women. The figures are lower than the district level, namely 40.8%, and similar to the provincial level (38%). Despite being lower than the district averages, women headed households tend to be more vulnerable and reflect a lack of employment opportunities in the area, which result in the men leaving to seek work in larger, urban areas.

Household income

Based on the data from the 2011 Census, 9.9% of the population of the BWM had no formal income, 3.3% earned less than R 4 800, 5.8% earned between R 5 000 and R 10 000 per annum, 21.6% between R 10 000 and R 20 000 per annum and 23.7% between R 20 000 and 40 000 per annum (2016). For Ward 2, 8.2% of the population had no formal income, 1.9% earned less than R 4 800, 3.1% earned between R 5 000 and R 10 000 per annum, 16.3% between R 10 000 and 20 000 per annum and 19.4% between R 20 000 and 40 000 per annum (Census 2011). The poverty gap indicator produced by the World Bank Development Research

Group measures poverty using information from household per capita income/consumption. This indicator illustrates the average shortfall of the total population from the poverty line. This measurement is used to reflect the intensity of poverty, which is based on living on less than R3 200 per month for an average sized household (~ 40 000 per annum). Based on this measure, in the region of 64.3% of the households in the BWM and 48.9% in Ward 2 live close to or below the poverty line. The current figures for both the BWM and Ward 2 are likely be higher due to impact of COVID-19 pandemic on the national, provincial, and local economy.

The low-income levels reflect the reliance on season employment in the agricultural sector and limited formal employment opportunities in the BWM. This is also reflected in the high unemployment rates. The low-income levels are a major concern given that an increasing number of individuals and households are likely to be dependent on social grants. The low-income levels also result in reduced spending in the local economy and less tax and rates revenue for the BWM. This in turn impacts on the ability of the BWM to maintain and provide services.

Employment

The official unemployment rate in the BWM in 2016 was 12.2%, while 44.1% were regarded as not economically active and 8.3% were discouraged work seekers. The figures for Ward 2 in 2011 were 6.2% and 37.1% respectively. These figures are significantly lower than the official unemployment 2011 rates for the Western Cape Province (21.6%) and National (29.8%). These lower rates do not however reflect seasonal unemployment which represents a significant challenge in the agricultural sector in the area.

The 2020 Socio-economic profile of the BWM prepared by the Provincial Government notes that the BWM (24.2%) had the highest unemployment area in the CKDM (22%) in 2019. The rate was also higher than the provincial rate (19.4%). The report notes that the high unemployment rate is particularly concerning given that this estimate is based on the narrow definition of unemployment i.e. the percentage of people that are able to work, but unable to find employment. In turn, the broad definition generally refers to people that are able to work, but not actively seeking employment. The current unemployment rates are likely be higher due to impact of COVID-19 pandemic on the national, provincial, and local economy.

Education

In terms of education levels, the percentage of the population over 20 years of age in the BWM and Ward 2 with no schooling was 5.5% (2016) and 6.8% (2011) respectively, compared to 2.4% for the Western Cape (2016). The percentage of the population over the age of 20 with matric was 32.3% and 28.3% respectively, compared to 35.2% for the Western Cape. The education levels in the BWM and Ward 2 are therefore marginally lower than the provincial levels. This reflects the rural nature of the area and the highlights the vulnerability of the local communities in these areas.

CHAPTER 7: ASSESSMENT OF POTENTIAL IMPACTS

This chapter serves to assess the significance of the positive and negative environmental impacts (direct, indirect, and cumulative) expected to be associated with the Poortjie Wes Cluster Grid. This assessment has considered the construction of the following infrastructure:

- A 132kV Belvedere Collector Switching Station (the "Collector Switching Station") and 132kV Overhead Lines ("OHLs") from each solar facility within the Poortjies Wes Custer. The Collector Switching Station will be +/-16ha in extent and will be located on Remaining Extent of Portion 2 of the Farm Belvedere Nr. 63.
- The proposed Collector Switching Station will connect to the new Poortjie Wes 400/132kV LILO MTS ("Poortjie Wes LILO MTS") via a 132kV OHL (approximately 7km in length). This OHL will cross the 400kV Droërivier/Hydra OHL. A corridor of 300m is being considered in the BA process, within which the 32m servitude for this power line will be located.
- A Poortjie Wes LILO MTS, which will have a footprint of ~16ha in extent. Two alternatives[16] are being considered and will be located on Portion 1 of the Montana Nr. 73, in the Beaufort West Local Municipality, Division of Murraysburg, Western Cape Province.
- The MTS will connect to either of the existing 400kV Droërivier/Hydra OHLs traversing the property via a Loop-in Loop-out ("LILO") connection, depending on the Eskom approved OHL. The 2 x 400kV LILO OHLs will be ~1km in length. A corridor of 500m is being considered in the BA process, within which the two 55m servitudes for these power lines will be located.

The full extent of the site (~1 051ha), the MTS development area and the 300m wide power line corridor was considered through the BA process. On-site sensitivities were identified through the review of existing information, desk-top evaluations, and field surveys. The identification of a development footprint for the infrastructure associated with the Poortjie Wes Cluster Grid within the project site was undertaken by the developer through consideration of the sensitive environmental features and areas and application of a mitigation hierarchy which aimed at avoidance as the first level of mitigation. The specialist assessments undertaken as part of this BA process have considered the buffer areas referred to above (refer to **Figure 7.1**).

The sections which follow provide a summary of the specialist input for each field of study in terms of the impacts which are expected to occur, the significance of the impacts, the opportunity for mitigation of the impacts to an acceptable level and the appropriate mitigation measures recommended for the reduction of the impact significance. Note that impacts associated with decommissioning are expected to be similar to those associated with construction activities for the majority of the environmental aspects. Therefore, in some instances, these impacts are not considered separately within this chapter. This section of the report must be read together with the detailed specialist studies contained in **Appendix D** to **J.**

[16] The alternative to be implemented will be informed by environmental sensitivities and will be determined in consultation with Eskom.

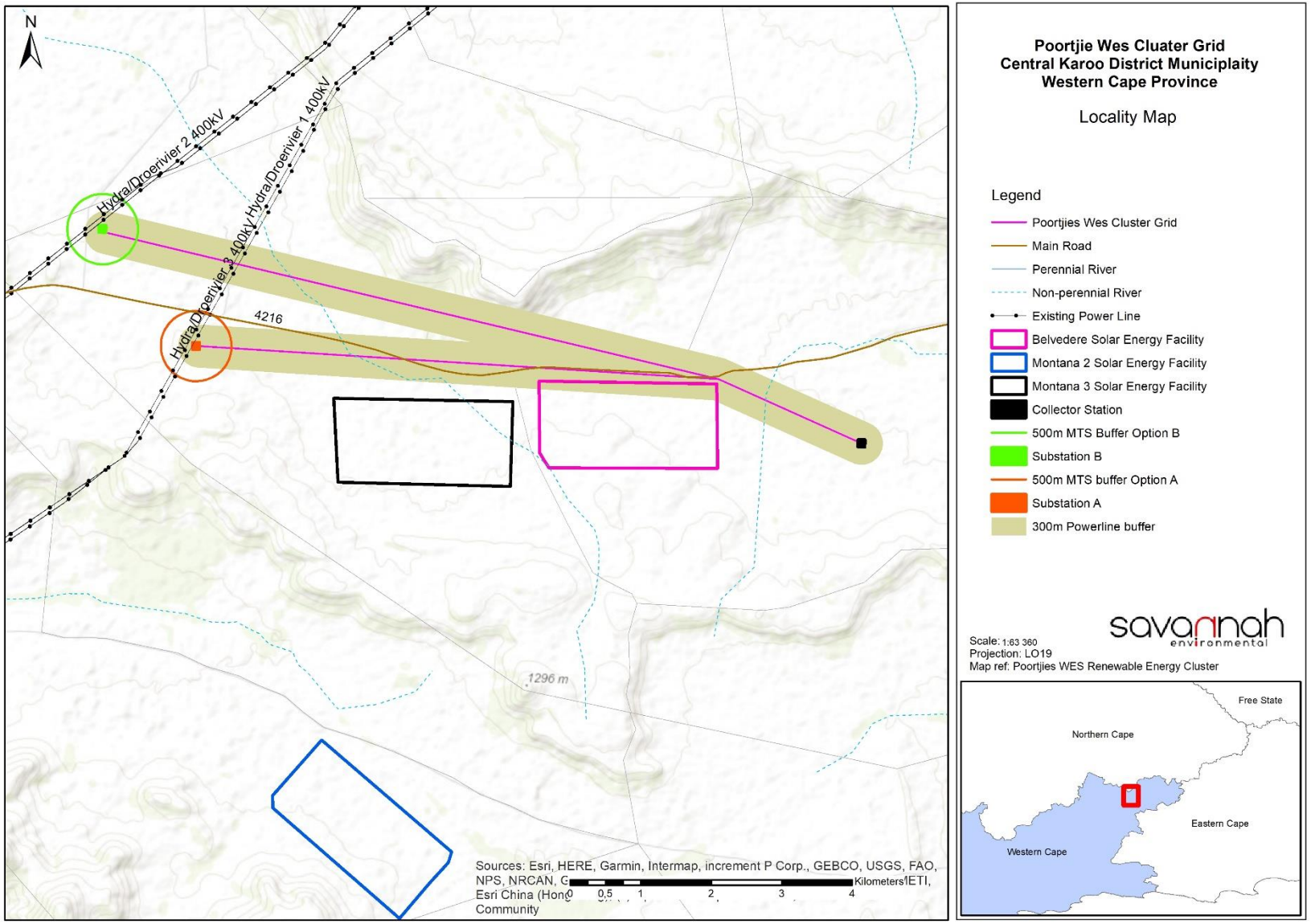


Figure 7.1: Map showing the development area, power line corridor and the development footprints of the proposed grid connection infrastructure assessed as part of this BA process.

The development of the Poortjie Wes Cluster Grid will comprise the following phases:

» ***Pre-Construction and Construction*** – will include pre-construction surveys; site preparation; establishment of access roads, laydown areas, staff accommodation, temporary security building and a concrete batching plant; construction of foundations involving excavations and cement pouring; the transportation of components/construction equipment to site, manoeuvring and operating vehicles for unloading and installation of equipment; and commissioning of new equipment and site rehabilitation. The duration of the construction phase for the Poortjie Wes Cluster Grid will depend on the authorisation of the six (6) proposed renewable energy facilities for which it will cater.

» ***Operation*** – will include the operation of the grid connection infrastructure (i.e., the 400kV MTS and power lines). The operation phase is expected to be ~ 25 years (with maintenance), or longer as required for the operation of the renewable energy facilities.

» ***Decommissioning*** – at the end of the economic life of the infrastructure, or when no longer required, decommissioning will include site preparation, disassembling of the components, clearance of the relevant infrastructure within the MTS development footprint and power line corridors, and rehabilitation.

7.1. 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 the EIA Regulations, 2014 - Appendix 1: Content of the Basic Assessment Reports:

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 Poortjie Wes Cluster Grid, 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 **sections 7.3. to 7.9.**
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 Poortjie Wes Cluster Grid are included in **sections 7.3. to 7.9.**
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 Poortjie Wes Cluster Grid are included in **sections 7.3. to 7.9.**
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 the Poortjie Wes Cluster Grid 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 7.3. to 7.9.**

Requirement	Relevant Section
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 the Poortjie Wes Cluster Grid, 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 7.3. to 7.9.**
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 7.3. to 7.9.**

7.2. Quantification of Areas of Disturbance on the Site

Site-specific impacts associated with the construction and operation of the Poortjie Wes Cluster Grid relate to the direct loss of vegetation and species of special concern, disturbance of animals, loss of habitat and impacts on soils. In order to assess the impacts associated with the Poortjie Wes Cluster Grid, it is necessary to understand the extent of the affected area. The following table provides details of the expected footprint for each of the project components:

Table 7.1: Poortjie Wes Cluster Component Footprints

Infrastructure	Footprint and dimensions
MTS	» Development footprint (permanent infrastructure) area: 600m x 600m
Collector Substation	» Development footprint (permanent infrastructure) area: 600m x 600m
Loop in Loop out power lines	» Servitude: 60m per line » Length: 1km » Disturbance at tower positions only. » Towers to be appropriately placed within the servitude
Power line from Collector Substation to MTS:	» Servitude: 40m » Length: 7km » Disturbance at tower positions only. » Towers to be appropriately placed within the servitude
Access and internal roads	Existing roads on the affected properties will be used where feasible and practical. The width of the roads at the access points will be up to 8m.
Temporary infrastructure total area	Temporary infrastructure (including laydown areas, , temporary security building and a concrete batching plant) will be required during the construction phase. The total area of the temporary infrastructure is expected to be ~5ha. All areas affected by temporary infrastructure will be rehabilitated following the completion of the construction phase, where it is not required for the operation phase.

7.3. Aspects determined through specialist investigation not requiring further assessment

From the specialist studies undertaken it was determined that soils and agricultural aspects did not require a detailed assessment. A Compliance Statement (refer to **Appendix F**) in this regard has been prepared in compliance with the relevant specialist protocols.

The most sensitive soil forms that can be expected for the area include the Hutton and Oakleaf soil forms. The land capability sensitivities (DAFF, 2017) indicate land capabilities with "Very Low to Moderate" sensitivities, which correlates with the requirements for a compliance statement only.

The available climate can limit crop production significantly. The harsh climatic conditions are associated with low annual rainfall and high evapotranspiration potential demands of the area. The area is not favourable for most cropping practices.

It is worth noting that, additional baseline soil field assessments can provide a better understanding of the soil or land potentials for the project area. It is the specialist's opinion that the proposed solar renewable energy project based on the DAFF (2017) land capability sensitivity of the area will have a limited impact on the agricultural production ability of the land. Additionally, the proposed activities will not result in the segregation of any high production agricultural land. Therefore, the proposed Poortjie Wes Cluster Grid development may be favourably considered.

7.4 Assessment of Impacts on Ecology (Fauna and Flora)

The development of the Poortjie Wes Cluster Grid is likely to result in a variety of impacts on ecology, associated largely with anthropogenic activities and influences within the landscape (refer to **Appendix D** for more details).

7.4.1. Results of the Ecology Impact Assessment

Several negative impacts to biodiversity were observed within the Protected Area of Interest (PAOL)and the surrounding landscape. These include:

- Existing energy distribution pylons and overhead lines;
- Livestock grazing land-use;
- Persecution and trapping;
- Roads and associated vehicle traffic and road kills; and
- Jackal-proof fences.

The National Web based Environmental Screening Tool provides the environmental sensitivity of the PAOI at a desktop level. The Plant Species Theme Sensitivity as indicated in the screening report was derived to be 'Medium' and the Animal Species Theme Sensitivity was derived to be 'Medium' to 'High' (Figure 7.2). The screening tool report can be downloaded at https://screening.environment.gov.za/screeningtool/#/pages/welcome.

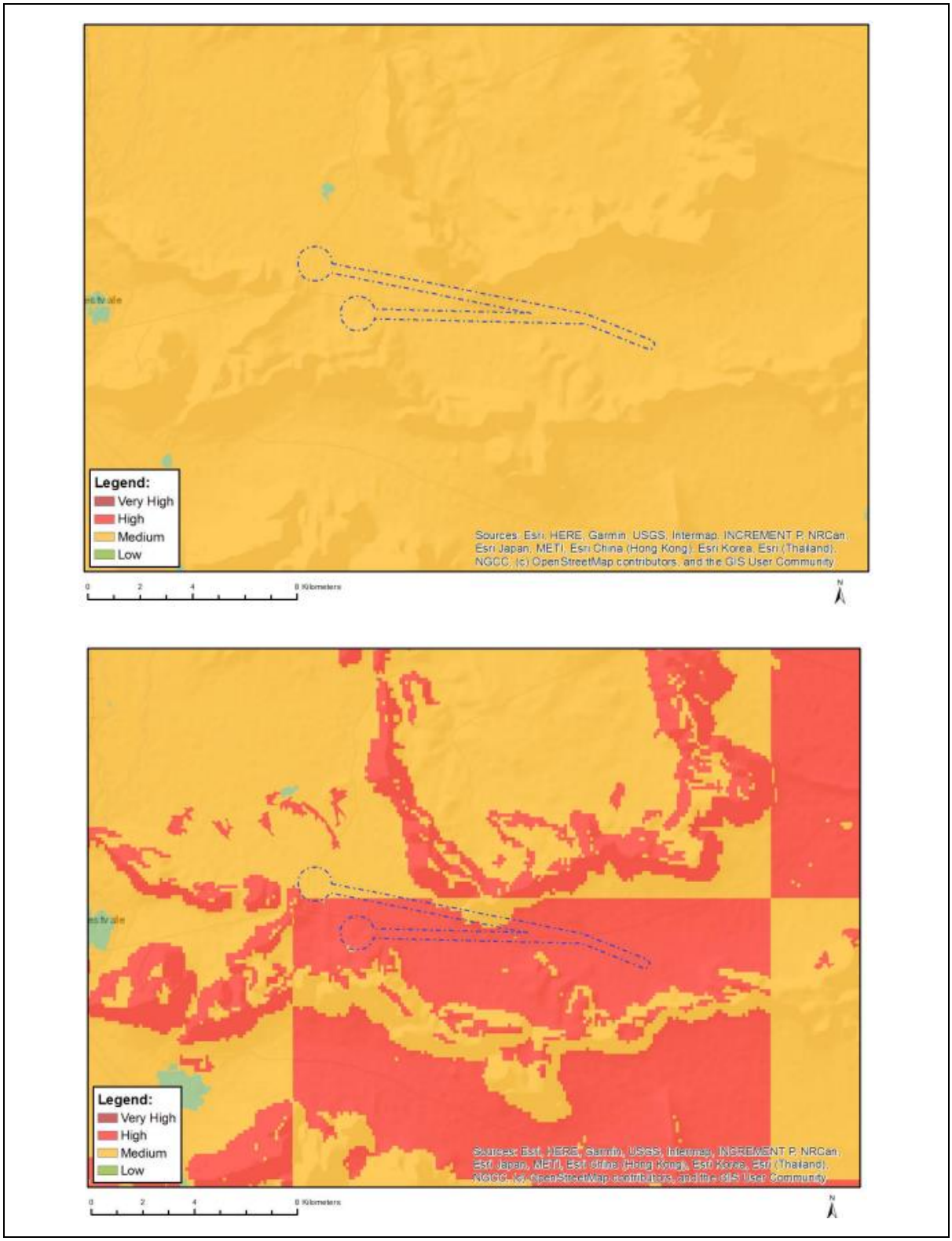


Figure 7.2 Plant Species Theme Sensitivity (top) and Animal Species Theme Sensitivity (bottom) for the proposed Poortjie Wes Grid Connection Infrastructure PAOI

All habitats within the PAOI were assigned a sensitivity category, i.e., a SEI category. The PAOI was categorised as possessing a 'High' SEI (Table 7.2). This indicates that the findings of this assessment are congruent with the Screening Tool for the Animal Theme Sensitivity. The guidelines for interpreting the SEI category are provided in Table 7.3.

Table 7.2 Summary of the proposed Poortjie Wes Grid Connection Infrastructure PAOI Site Ecological Importance

Area (ha)	Conservation Importance	Functional Integrity	Biodiversity Importance	Receptor Resilience	Site Ecological Importance
297.168	Medium Confirmed or highly likely occurrence of populations of NT species	High Very large (> 100 ha) intact area for any conservation status of ecosystem type. High habitat connectivity serving as functional ecological corridors, limited road network between intact habitat patches.	Medium	Low Habitat that is unlikely to be able to recover fully after a relatively long period: > 15 years required to restore ~ less than 50% of the original species composition and functionality of the receptor functionality.	High

Table 7.3 Guidelines for interpreting Site Ecological Importance in the context of the proposed development activities

Site Ecological Importance (SEI)	Interpretation in relation to proposed development activities
High	Avoidance mitigation wherever possible. Minimisation mitigation – changes to project infrastructure design to limit the amount of habitat impacted, limited development activities of low impact acceptable. Offset mitigation may be required for high impact activities.

7.4.1. Habitat Assessment and Species of Conservation Concern

The vegetation recorded within the PAOI was congruent with the Gamka Karoo and Upper Karoo Hardeveld vegetation types. Several species of flora protected under provincial legislation were recorded within the project area during the survey period. It is important to note that during the field survey these species were not geotagged due to time constraints. Additional species that although not protected, but that should be relocated due to their scarcity within the landscape and/or their ability to survive relocation are also provided.

- Aizoaceae: *Drosanthemum hispidum*
- Aizoaceae: *Psilocaulon coriarium*
- Aizoaceae: *Ruschia intricata*
- Aizoaceae: *Ruschia spinosa*
- Aizoaceae: *Trichodiadema* sp.
- Amaryllidaceae: *Ammocharis coranica*
- Amaryllidaceae: *Boophone disticha*
- Anacampserotaceae: *Anacampseros albidiflora*
- Apocynaceae: *Pachypodium succulentum*

- Asparagaceae: *Albuca crispa*
- Asparagaceae: *Albuca* sp.
- Asphodelaceae: *Aloe claviflora*
- Asphodelaceae: *Haworthiopsis tessellata*
- Euphorbiaceae: *Euphorbia ferox*
- Euphorbiaceae: *Euphorbia decepta*
- Hyacinthaceae: *Dipcadi* sp. A
- Hyacinthaceae: *Dipcadi* sp. B
- Hyacinthaceae: *Ledebouria apertiflora*
- Ruscaceae: *Eriospermum* sp.

In terms of CBAs, the proposed development overlaps with Ecological Support Areas 1 and 2, Other Natural Area and marginally with a CBA1. ESA1 features are important in supporting the functioning of Protected Areas or Critical Biodiversity Areas and are often vital for ecosystem services. These ESAs must be maintained in a functional, near-natural state. Some habitat loss is acceptable, provided underlying biodiversity objectives/ecological functioning are not compromised (CapeNature, 2017). The ESA associated with the PAOI was defined as such due to watercourse protection. ONAs retain most of their natural character and perform biodiversity and ecological infrastructure functions but have not been prioritised in the current Western Cape Biodiversity Spatial Plan. CBAs are critically required in order to meet biodiversity pattern and process thresholds. CBAs are areas of high biodiversity and ecological value and need to be kept in a natural or near-natural state, with no further loss of habitat or species. Degraded areas should be rehabilitated to natural or near-natural condition. Only low-impact, biodiversity-sensitive land uses are appropriate (CapeNature, 2017).

7.4.2. Description of Impacts on Terrestrial Ecology

The development and operation of the Poortjie Wes Cluster Grid 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 detailed assessment is provided in the specialist report included in **Appendix D**.

Potential impacts to biodiversity during the construction, operation, and decommissioning phases associated with the proposed Poortjie Wes Grid Connection Infrastructure are as follows;

- Habitat Destruction
- Spread and/or establishment of alien and/or invasive species into disturbed areas
- Reduced dispersal/migration of fauna
- Emigration of fauna

7.4.3. Assessment of Potential Impacts

Construction Phase Impacts

Impact Nature: Loss of habitat within development footprint
There will be a loss of natural vegetation and habitat due to construction of the required infrastructure, particularly with regards to the proposed substations and access roads. This impact was considered for both the construction and operational phases.

	Without mitigation	With mitigation
Extent	Low (2)	Low (2)
Duration	Long term (4)	Long term (4)
Magnitude	High (8)	Low (4)
Probability	Definite (5)	Definite (5)
Significance	**High (70)**	**Medium (50)**
Status (positive or negative)	Negative	Negative
Reversibility	High	High
Irreplaceable loss of resources?	Yes	No
Can impacts be mitigated?	Yes, albeit to a limited extent.	

Mitigation:

» Construction areas must be clearly demarcated to avoid intrusion into surrounding habitats.
» Vegetation clearing to commence only after the necessary permits have been obtained.
» Environmental Officer (EO) to provide supervision and oversight of vegetation clearing activities.
» No pylons are to be placed within drainage features and buffer zones.
» Riparian buffer zones must be avoided and not used as laydown and/or storage areas.
» All denuded areas to be rehabilitated during the closure phase.

Residual Impacts:

The loss of indigenous vegetation is an unavoidable consequence of the development and cannot be entirely mitigated. The residual impact would be moderate.

Impact Nature: Degradation and loss of surrounding natural habitat

Degradation and loss of surrounding natural vegetation arising from construction activities if these are allowed to penetrate into the surrounding area.

	Without mitigation	With mitigation
Extent	Moderate (3)	Low (2)
Duration	Long term (4)	Very short term (1)
Magnitude	Moderate (6)	None (0)
Probability	Highly probable (4)	Improbable (2)
Significance	**Medium (44)**	**Low (6)**
Status (positive or negative)	Negative	Negative
Reversibility	High	High
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	Yes	

Mitigation:

» Pre-construction environmental induction for all construction staff on site to ensure that basic environmental principles are adhered to. This includes awareness of no littering, appropriate handling of pollution and chemical spills, avoiding fire hazards, remaining within demarcated construction areas etc.
» All construction activity and roads to be within the clearly defined and demarcated areas.
» Temporary laydown areas should be clearly demarcated and rehabilitated subsequent to end of use.
» Appropriate dust control measures to be implemented.
» Suitable sanitary facilities to be provided for construction staff as per the guidelines in Health and Safety Act.
» All hazardous materials, if any, should be stored in the appropriate manner to prevent contamination of the site. Any accidental chemical, fuel and oil spills that occur at the site should be cleaned up in the appropriate manner.

Residual Impacts:

It is unlikely that residual impacts are expected if the appropriate mitigation measures are implemented. However, there may still be minimal degradation due to dust precipitation.

Impact Nature: Direct mortality of fauna

Construction activity will likely lead to direct mortality of fauna due to earthworks, vehicle collisions, accidental hazardous chemical spills and persecution.		
	Without mitigation	**With mitigation**
Extent	Moderate (3)	Low (2)
Duration	Short term (2)	Short term (2)
Magnitude	Low (4)	Minor (2)
Probability	Highly probable (4)	Improbable (2)
Significance	**Medium (36)**	**Low (12)**
Status (positive or negative)	Negative	Negative
Reversibility	Moderate	High
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	Yes, vehicle collisions, poaching, and persecution can be mitigated.	
Mitigation: » All personnel should undergo environmental induction with regards to fauna and awareness about not harming or collecting species. » Prior to commencing work each day, two individuals should traverse the working area in order to disturb any fauna and so they have a chance to vacate. » Any fauna threatened by the construction activities should be removed safely by an appropriately qualified environmental officer or removal specialist. » All construction vehicles should adhere to a speed limit of maximum 40 km/h to avoid collisions. Appropriate speed control measures and signs must be erected. » All hazardous materials, if any, should be stored in the appropriate manner to prevent contamination of the site. Any accidental chemical, fuel and oil spills that occur at the site should be cleaned up in the appropriate manner. » Any excavations should not be left open for extended periods of time as fauna may fall in and become trapped in them. Excavations should only be dug when they are required and should be used and filled shortly thereafter.		
Residual Impacts: It is probable that some individuals of susceptible species will be lost to construction-related activities despite mitigation. However, this is not likely to impact the viability of the local population of any fauna species.		

Impact Nature: Emigration of fauna due to noise pollution		
Construction activity will likely lead to the emigration of fauna due to noise pollution.		
	Without mitigation	**With mitigation**
Extent	Moderate (3)	Moderate (3)
Duration	Short term (2)	Short term (2)
Magnitude	Moderate (6)	Low (4)
Probability	Highly probable (4)	Highly probable (4)
Significance	**Medium (44)**	**Medium (36)**
Status (positive or negative)	Negative	Negative
Reversibility	Moderate	High
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	Yes, but only to a limited extent. The mitigation of noise pollution during construction is difficult to mitigate against	
Mitigation: Considering that many of the mammal fauna recorded within the project area are nocturnal, no construction activity is to occur at night.		
Residual Impacts:		
It is probable that some individuals of susceptible species will emigrate due to the noise generated from the construction activity. However, this is not likely to impact the viability of the local population of any fauna species.		

Operation Phase Impacts

Impact Nature: Loss of habitat within development footprint		
There will be a loss of natural vegetation and habitat due to construction of the required infrastructure, particularly with regards to the proposed substations and access roads. This impact was considered for both the construction and operational phases.		
	Without mitigation	**With mitigation**
Extent	Low (2)	Low (2)
Duration	Long term (4)	Long term (4)
Magnitude	High (8)	Low (4)
Probability	Definite (5)	Definite (5)
Significance	**High (70)**	**Medium (50)**
Status (positive or negative)	Negative	Negative
Reversibility	High	High
Irreplaceable loss of resources?	Yes	No
Can impacts be mitigated?	Yes, albeit to a limited extent.	
Mitigation: » Development areas must be clearly demarcated during construction to avoid intrusion into surrounding habitats. » Vegetation clearing to commence only after the necessary permits have been obtained. » Environmental Officer (EO) to provide supervision and oversight of vegetation clearing activities. » No pylons are to be placed within drainage features and buffer zones. » Riparian buffer zones must be avoided and not used as laydown and/or storage areas. » All denuded areas to be rehabilitated during the closure phase.		
Residual Impacts: The loss of indigenous vegetation is an unavoidable consequence of the development and cannot be entirely mitigated. The residual impact would be moderate.		

Impact Nature: Encroachment of Invasive Alien Plants into disturbed areas		
Invasive Alien Plants (IAPs) tend to encroach into disturbed areas and can outcompete/displace indigenous vegetation.		
	Without mitigation	**With mitigation**
Extent	Moderate (3)	Moderate (3)
Duration	Permanent (5)	Very short term (1)
Magnitude	High (8)	Minor (2)
Probability	Highly probable (4)	Improbable (2)
Significance	High (64)	Low (12)
Status (positive or negative)	Negative	Negative
Reversibility	High	High
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	Yes	
Mitigation: » An IAP Management Plan must be written for the development. » Regular monitoring for IAP encroachment during the operation phase to ensure that no alien invasion problems have developed as result of the disturbance. This should be every 3 months during the first two years of the operation phase and every six months for the life of the project. » All IAP species must be removed/controlled using the appropriate techniques as indicated in the IAP management plan.		
Residual Impacts: Based on the lack of IAPs within the development area and the implementation of an IAP Management Plan there are unlikely to be residual impacts		

Impact Nature: Soil erosion and continued habitat degradation		
Disturbance created during the construction phase will leave the development area vulnerable to erosion		
	Without mitigation	**With mitigation**
Extent	Moderate (3)	Moderate (3)
Duration	Permanent (5)	Very short term (1)
Magnitude	High (8)	Minor (2)
Probability	Highly probable (4)	Improbable (2)
Significance	High (64)	Low (12)
Status (positive or negative)	Negative	Negative
Reversibility	High	High
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	Yes	
Mitigation: » A Rehabilitation Plan must be written for the development area and ensured that it be adhered to. » Access roads should have run-off control features which redirect water flow and dissipate any energy in the water which may pose an erosion risk. » All erosion observed should be rectified as soon as possible, using the appropriate erosion control structures and revegetation techniques. » There should be follow-up rehabilitation and re-vegetation of any remaining denuded areas with local indigenous perennial shrubs and succulents from the area.		
Residual Impacts: There is still the potential for erosion but would have a low impact.		

Impact Nature: Direct mortality of fauna during maintenance procedures		
Disturbance or persecution of fauna may occur from personnel or staff that are involved in infrastructure maintenance. In addition, there is the possibility of roadkill within the access roads.		
	Without Mitigation	**With Mitigation**
Extent	Low (2)	Low (2)
Duration	Long term (4)	Very short term (1)
Magnitude	Low (4)	Minor (2)
Probability	Probable (3)	Very improbable (1)
Significance	**Medium (30)**	**Low (5)**
Status	Negative	Negative
Reversibility	Moderate	High
Irreplaceable loss of resources	No	No
Can impacts be mitigated?	Yes	
Mitigation: » All staff are to be educated on the importance of local fauna and must be made aware that no poaching or persecution is allowed. » Any fauna threatened by the maintenance and operational activities should be removed to a safe location by an appropriate individual. » All vehicles accessing the site should adhere to a max 40 km/h max to avoid collisions. Appropriate signs must be erected. » If any excavations are to be dug these must not be left open for more than a few hours without ramps for trapped fauna to leave and must be filled at night.		
Residual Impacts: Disturbance from maintenance activities will occur albeit at a low and infrequent level.		

Decommissioning Phase Impacts

Impact Nature: Direct mortality of fauna		
Decommissioning activity will likely lead to direct mortality of fauna due to earthworks, vehicle collisions and persecution.		
	Without mitigation	**With mitigation**
Extent	Moderate (3)	Low (2)
Duration	Short term (2)	Short term (2)
Magnitude	Low (4)	Minor (2)
Probability	Probable (3)	Improbable (2)
Significance	Low (27)	Low (12)
Status (positive or negative)	Negative	Negative
Reversibility	Moderate	High
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	Yes, vehicle collisions, poaching, and persecution can be mitigated.	

Mitigation:

- All personnel should undergo environmental induction with regards to fauna and awareness about not harming or collecting species.
- Prior to commencing work each day, two individuals should traverse the working area in order to disturb any fauna and so they have a chance to vacate.
- Any fauna threatened by the construction activities should be removed safely by an appropriately qualified environmental officer or removal specialist.
- All construction vehicles should adhere to a speed limit of maximum 40 km/h to avoid collisions. Appropriate speed control measures and signs must be erected.
- All hazardous materials, if any, should be stored in the appropriate manner to prevent contamination of the site. Any accidental chemical, fuel and oil spills that occur at the site should be cleaned up in the appropriate manner.
- Any excavations should not be left open for extended periods of time as fauna may fall in and become trapped in them. Excavations should only be dug when they are required and should be used and filled shortly thereafter.

Residual Impacts:

It is probable that some individuals of susceptible species will be lost to construction-related activities despite mitigation. However, this is not likely to impact the viability of the local population of any fauna species.

Impact Nature: Continued habitat degradation		
Disturbance created during decommissioning will leave the development area vulnerable to erosion and alien plant invasion for several years.		
	Without Mitigation	**With Mitigation**
Extent	Low (2)	Low (2)
Duration	Long-term (4)	Long-term (3)
Magnitude	Medium (3)	Minor (2)
Probability	Probable (3)	Improbable (2)
Significance	Medium (27)	Low (14)
Status	Negative	Negative
Reversibility	Low	High
Irreplaceable loss of resources	Yes	No
Can impacts be mitigated?	Yes, with proper management and avoidance, this impact can be mitigated to a low level.	

Mitigation: » Rehabilitation in accordance with the Rehabilitation Plan for the development must be undertaken in areas disturbed during the decommissioning phase. » Monitoring of the rehabilitated area must be undertaken at quarterly intervals for 3 years after the decommissioning phase. » All erosion problems observed should be rectified as soon as possible, using the appropriate erosion control structures and revegetation techniques. » There should be follow-up rehabilitation and revegetation of any remaining bare areas with indigenous flora.
Residual Impacts: No significant residual risks are expected, although IAP encroachment and erosion might still occur but would have a negligible impact if effectively managed.

7.4.4. Implications for Project Implementation

The aim of this Biodiversity Impact Assessment was to provide information to guide the risk of the proposed Poortjie Wes Grid Connection Infrastructure to the ecosystems affected by its development and their inherent fauna and flora. Based on the latest available ecologically relevant spatial data the following information is pertinent to the project area:

» It is recognised as an Ecological Support Area and an Other Natural Area as per the Western Cape Biodiversity Spatial Plan;
» The Combined Animal Species Theme Sensitivity was rated as 'Medium' to 'High' according the Environmental Screening Tool; and
» The Ecosystem Protection Level for the vegetation types associated with the development footprint is regarded as Poorly Protected.

Based on the fauna components recorded within the PAOI and proximal landscape, the area provides important ecosystem services, particularly with regards to the maintenance of dynamic soil properties and nutrient cycling. The SEI of the PAOI was determined to 'High' based on the high likelihood of occurrence for NT species, the extent of the area considered and its connectivity to natural areas within the landscape, and the low resilience of the vegetation type.

The main expected impacts of the proposed development will be the loss of habitat and emigration of fauna. Based on the outcomes of the SEI determination, the project possesses a 'High' SEI. This denotes that avoidance mitigation wherever possible must be implemented. This includes changes to project infrastructure design to limit the amount of habitat impacted. Moreover, the avoidance and minimisation mitigation measures are the most important with respect to the mitigation hierarchy. Therefore, the infrastructure footprint must be minimised to reduce the risk of impacts to the receiving environment.

The project area is located within the Central Corridor of the Strategic Transmissions Corridors and taking into consideration that the grid infrastructure is necessary for the proposed solar energy developments and can be appropriately placed to minimise impacts on terrestrial ecology, it is the opinion of the specialist that the authorisation of the proposed project may be favourably considered. It is recommended that should any additional future developments be proposed for the remaining extent of any 'Very High' or 'High' SEI areas within the associated properties, that offset strategies be required for these authorisations. No preference (Option A or Option B) was given to the preferred alternative in terms of ecological sensitivities.

7.5 Assessment of Impacts on Avifauna

Various impacts have been identified to be associated with the development of the Poortjie Wes Cluster Grid from an avifaunal perspective. Potential impacts and the relative significance of the impacts are summarised below (refer to **Appendix E** for more details)

7.5.1. Results of the Avifauna Impact Assessment

The site is positioned wholly within Gamka Karoo vegetation in a flat lowland plain located in a valley between the dolerite dominated Klein-waaifontein Mountain in the north and Vaalkoppe in the south. The area is primarily used for livestock production despite the relatively low carrying capacity of the natural veld type. This vegetation represents one of the most arid units of the Nama-Karoo Biome comprising dwarf spiny shrubland dominated by Karoo dwarf shrubs with rare low trees (e.g. *Euclea undulata*). Dense stands of drought-resistant grasses (*Stipagrostis, Aristida*) cover (especially after abundant rains) broad sandy bottomlands. The flat nature of the landscape has resulted in the broad wash areas that experience sheet runoff, exposing bare patches of ground lacking ground cover, particularly in areas with elevated grazing pressure from livestock farming. Scattered thorn trees are present in the area with increasing density towards larger drainage lines and surrounding depressions. Several overhead power lines traverse the area to the west of the proposed development site, these provide artificial nesting platforms for several species, including a Martial Eagle nest that was presumed active due to the presence of white-wash and a monitor lizard skull found below the nest.

The output from the Screening Tool (as of 2022-05-27) indicated that the majority of area was of high sensitivity in the Animal Species Theme, with patches of high sensitivity due to the potential presence of several avifaunal species of conservation concern (SCCs), namely Black Harrier (*Circus maurus*), Ludwig's Bustard (*Neotis ludwigii*), Lanner Falcon (*Falco biarmicus*), Martial Eagle (*Polemaetus bellicosus*) and Verreaux's Eagle (Aquila verreauxii) and medium sensitivity for possible presence of Black Stork (*Ciconia nigra*) and Southern Black Korhaan (*Afrotis afra*).

Two hundred and eight-three (283) bird species could regularly occur in the project area. This includes 19 red-listed species, six of which are endemic. Ten (10) priority species were recorded during the pre-construction bird monitoring period from June 2019 to August 2020. These include, Martial Eagle, Verreaux's Eagle, Cape Vulture, Blue Crane, Ludwig's Bustard, Denharm's Bustart, Kori Bustard, Southern Black Korhaan and Secretary Bird.

Avifaunal SCCs observed during the site visits included Karoo Korhaan, Ludwig's Bustard, Secretarybird, Martial Eagle, Lanner Falcon, Blue Crane, Southern Black Korhaan and Verreaux's Eagle. A Martial Eagle nest was located on the existing Overhead Power Line near the proposed grid connection point. This nest was assumed to be active within the last couple of years due to the presence of white-wash and a monitor lizard skull found below the nest.

The Martial Eagle nest is located on existing overhead power line and these birds are therefore likely to be accustomed to flying in and around transmission infrastructure, however a novel overhead transmission line may present additional challenges particularly to naïve offspring learning to fly. Areas in proximity to the nest likely represent areas of higher site ecological importance and avifaunal sensitivity also for potential disturbance impacts during the breeding periods. Martial Eagle in the drier karoo areas tend to prefer thicker vegetation associated with the watercourses and irregular terrain as they are likely higher productivity

foraging areas. Therefore, more wooded vegetation along the drainage lines have been considered to be of High sensitivity. The receptor resilience for most species is considered to be Very High due to the very high likelihood of the species to remain on site during the impact or return to site once the impact has ceased as the surrounding areas are largely contiguous suitable habitat and therefore displacement distances are not likely to be large or incur a high energetic cost, with the exception of Martial Eagle whose breeding success may be impacted upon during certain periods.

7.5.2. Description of Impacts on Avifauna

The following key potential impacts on avifauna, arising from the proposed development have been identified for assessment:

Construction Phase:

- Direct Habitat Destruction – modification, removal and clearing of vegetation for development of infrastructure such as temporary laydown areas, site buildings, pylon bases, access roads and servitudes;
- Disturbance/Displacement – indirect habitat loss and/or reduced breeding success due to displacement by noise and activity associated with machinery and construction activity; and
- Direct Mortality – fatalities of avifauna due to vehicle collision, entrapment, entanglement or collision with temporary infrastructure (e.g. fencing), entrapment in uncovered excavations and increased predation pressure.

Operational Phase:

- Disturbance/Displacement – indirect habitat loss, reduced breeding success, obstruction of movement corridors due to displacement by infrastructure and noise/activity associated with ongoing, routine operational tasks/maintenance activity; and
- Direct Mortality – fatalities of avifauna due to collision with or entrapment with perimeter fencing, collision with overhead power lines, and electrocution from energized electrical components.

Decommissioning Phase:

- As per construction phase.

7.5.3. Assessment of Potential Impacts

Construction Phase Impacts

Nature: Habitat destruction due to clearing of vegetation in the development footprint for the construction of infrastructure such as collection/switching/transmission stations, temporary laydown areas, site buildings, servitudes and access roads. This results in loss of area available to avifaunal species for foraging and breeding.		
	Without mitigation	**With mitigation**
Extent	Footprint (1)	Footprint (1)
Duration	Long-term (4)	Long-term (4)
Magnitude	Small (0)	Small (0)
Probability	Definite (5)	Definite (5)
Significance	**Low (25)**	**Low (25)**
Status (positive or negative)	Negative	Negative
Reversibility	Yes	Yes
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	Partially	

Mitigation:

» Construction of facilities such as collector/switching/transmission stations, temporary laydown areas, site buildings, and overhead power lines should be positioned as far away from the Martial Eagle nest as practically possible given the assessment corridor;
» Laydown and other temporary infrastructure to be placed within very low sensitivity areas, preferably previously transformed areas, wherever possible;
» Appropriate run-off and erosion control measures are to be implemented where required;
» A site-specific environmental management programme (EMPr) must be implemented, which gives appropriate and detailed description of how construction activities must be conducted to reduce unnecessary destruction of habitat (e.g. no open fires outside of designated areas);
» All contractors are to adhere to the EMPr and should apply good environmental practice during construction;
» All hazardous materials should be stored in the appropriate manner to prevent contamination of the site and downstream environments. Any accidental chemical, fuel and oil spills that occur at the site should be cleared as appropriate for the nature of the spill;
» Existing roads and farm tracks should be used where possible;
» The minimum footprint areas of infrastructure should be used wherever possible, including road widths and lengths;
» No off-road driving should be permitted in areas not identified for clearing;
» An Environmental Site Officer (ESO) must form part of the on-site team to ensure that the EMPr is implemented and enforced and an Environmental Control Officer (ECO) must be appointed to oversee the implementation activities and monitor compliance for the duration of the construction phase; and
» Following construction, rehabilitation of areas disturbed by temporary laydown areas and facilities must be undertaken.

Residual Impacts:

Habitat cleared for the construction of permanent facilities will not be available for use by avifaunal species during the operational lifespan of the development. No long-term residual impacts are likely to negatively influence the viability or persistence of the avifaunal community of the receiving environment given the relatively small development footprint.

Nature: Disturbance or displacement of birds due to increased noise and activity levels associated with construction machinery and personnel resulting in an indirect loss of habitat available for foraging and breeding. Project area already experiences relatively high levels of regular disturbance from commercial crop production activities.

	Without mitigation	**With mitigation**
Extent	Local (2)	Local (2)
Duration	Very Short-term (1)	Very Short-term (1)
Magnitude	Minor (2)	Minor (2)
Probability	Low Likelihood (2)	Low Likelihood (2)
Significance	**Low (10)**	**Low (10)**
Status (positive or negative)	Negative	Negative
Reversibility	Yes	Yes
Irreplaceable loss of resources?	Unlikely	Unlikely
Can impacts be mitigated?	Yes	

Mitigation:

» A site specific EMPr must be implemented, which gives appropriate and detailed description of how construction activities must be conducted;
» All contractors are to adhere to the EMPr and should apply good environmental practice during construction;
» Environmental Officer to oversee activities and ensure that the site specific EMPr is implemented and enforced;
» Maximum use of existing access road and servitudes;
» Existing and novel access roads are to be suitably upgraded or constructed to prevent damage and erosion resulting from increased vehicular traffic and construction vehicles;
» No off-road driving in undesignated areas;

» Speed limits (30 km/h) should be strictly enforced on site to reduce unnecessary noise; » Construction camps should be lit with as little light as practically possible, with the lights directed downwards where appropriate; » The movement of construction personnel should be restricted to the construction areas on the project site; » No dogs or cats other than those of the landowners should be allowed on site; » The appointed Environmental Officer must be trained to identify the potential Red Data species as well as the signs that indicate possible breeding by these species; and » If any avifaunal SCCs are confirmed to be attempting breeding during the construction phase (e.g. if the Martial Eagle nest is re-occupied), construction activities within 1 000 m of the breeding site must cease during the breeding period (e.g. May to August/September for Martial Eagle) (500 m for Jackal Buzzard and ground-dwelling species), and an avifaunal specialist is to be contacted immediately for further assessment of the situation and instruction on how to proceed.
Residual Impacts: None.

Nature: Avifaunal fatalities caused by construction activity including vehicle collision (i.e. roadkill), entrapment within security fencing or uncovered excavations.		
	Without mitigation	**With mitigation**
Extent	Local (2)	Local (2)
Duration	Very Short-term (1)	Very Short-term (1)
Magnitude	Minor (2)	Minor (2)
Probability	Distinct Possibility (3)	Low Likelihood (2)
Significance	**Low (15)**	**Low (10)**
Status (positive or negative)	Negative	Negative
Reversibility	Yes	Yes
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	Yes	
Mitigation: » Maximum use of existing access road and servitudes; » No off-road driving in undesignated areas; » Speed limits (30 km/h) should be strictly enforced on site to reduce probability of vehicle collisions; » The movement of construction personnel should be restricted to the construction areas on the project site; » No dogs or cats other than those of the landowners should be allowed on site; » Any holes dug e.g. for foundations of pylons should not be left open for extended periods of time to prevent entrapment by ground dwelling avifauna or their young and only be dug when required and filled in soon thereafter; » Temporary fencing must be suitably constructed, e.g. if double layers of fencing are required for security purposes, they should be positioned at least 2 m apart to reduce the probability of entrapment by larger bodied species that may find themselves between the two fences; » Roadkill is to be reported to the ECO and removed as soon as possible to reduce attracting crows.		
Residual Impacts: None.		

Operation Phase Impacts

Nature: Disturbance or displacement of birds due to increased noise and activity levels associated with operational activities or the position of overhead power lines resulting in an indirect loss of habitat available for foraging and breeding.		
	Without mitigation	**With mitigation**
Extent	Local (2)	Local (2)

Duration	Very Short-term (1)	Very Short-term (1)
Magnitude	Minor (2)	Minor (2)
Probability	Low Likelihood (2)	Low Likelihood (2)
Significance	**Low (10)**	**Low (10)**
Status (positive or negative)	Negative	Negative
Reversibility	Yes	Yes
Irreplaceable loss of resources?	Unlikely	Unlikely
Can impacts be mitigated?	Yes	

Mitigation:

» A site specific operational EMPr must be implemented, which gives appropriate and detailed description of how operational and maintenance activities must be conducted to reduce unnecessary disturbance;
» All contractors are to adhere to the environmental management programme and should apply good environmental practice during all operations;
» Routine maintenance should be conducted outside of the breeding period in areas within 1 000 m of the Martial Eagle nest if active breeding attempts are observed; and
» Operational phase bird monitoring, in line with the latest available guidelines, must be implemented.

Residual Impacts:
None.

Nature: Bird fatalities due to collision, entrapment or electrocution.		
	Without mitigation	**With mitigation**
Extent	Local (3)	Local (3)
Duration	Long-term (4)	Long-term (4)
Magnitude	Low (4)	Low (4)
Probability	Probable (3)	Low Likelihood (2)
Significance	**Medium (33)**	**Low (22)**
Status (positive or negative)	Negative	Negative
Reversibility	Yes	Yes
Irreplaceable loss of resources?	Unlikely	Unlikely
Can impacts be mitigated?	Partially	

Mitigation:

» Appropriate (approved) Bird flight diverters (BFDs) to be affixed to the entire length of novel above-ground overhead power lines;
» Support pylons to be of a 'bird friendly' and monopole design wherever practically possible;
» Perch deterrents are to be affixed to the appropriate sections of support pylons to dissuade perching opportunities;
» If one or more avifaunal SCC carcasses are located and determined likely to have resulted from collisions with infrastructure in any sensitivity area over the lifespan of the facility the fatality is to be appropriately recorded and reported to an avifaunal specialist to determine the most appropriate action;
» If double layers of fencing are required for security purposes, they should be positioned at least 2 m apart to reduce the probability of entrapment by larger bodied species that may find themselves between the two fences;
» Develop and implement a carcass search and bird activity monitoring programme in-line with the latest applicable guidelines;
» Regular reviews of operational phase monitoring data and results to be conducted by an avifaunal specialist;
» Lighting should be kept to a minimum to avoid attracting insects, birds, and light
» sensors/switches should be utilised to keep lights off when not required;
» Lighting fixtures should be hooded and directed downward where possible, to minimize the skyward and horizontal illumination, lighting should be motion activated where possible;

» Cattle grids should be modified to allow for any chicks that fall in to escape (e.g. by placing a ramp inside the structure); » If unacceptable impacts are observed (in the opinion of the bird specialist and independent review), the specialist should conduct a literature review specific to the impact and provide updated and relevant mitigation options to be implemented.
Residual Impacts: Current mitigation measures, while effective, are not capable of completely preventing collisions and some residual impact will remain.

Decommissioning Phase Impacts

The impacts of the decommissioning phase are similar to those of the construction phase, with the exception of a reduced impact of habitat destruction. Temporary disassembly and storage areas associated with the decommission phase are to be positioned on the same sites as those used for temporary laydown areas during the construction phase where possible to reduce the incidence of novel habitat destruction.

7.5.4. Implications for Project Implementation

The proposed development site is well suited for the development of grid connection infrastructure such as that proposed. The available habitat across the site is already modified through grazing pressure and is located relatively close to existing overhead transmission lines, resulting in a reduced length of novel overhead powerline required for the grid connection, reducing the potential impact on species particularly susceptible to collisions with transmission lines such as bustards, cranes and storks in the area.

Martial Eagle are known to utilise multiple nesting structures within their territory, often alternating between multiple sites. This species can also forgo breeding attempts in years following a successful attempt. Therefore, a distinct possibility exists that Martial Eagle will not attempt to utilise the located nest structure during the construction phase due to factors unrelated to the proposed development. Should it become apparent that a breeding attempt is being made, however, impacts are relatively easy to mitigate through avoidance of the area during the appropriate periods (e.g. May to August/September).

The proposed development is unlikely to have a significant negative impact on the long-term viability or persistence of avifaunal species in the area and therefore can be approved from an avifaunal perspective. As such, no preference (Option A or Option B) was given to the preferred alternative in terms of avifaunal sensitivities.

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

The proposed Poortjie Wes Cluster Grid will have a medium to low negative impact on heritage resources following implementation of mitigation measures. Potential impacts, and the relative significance of the impacts are summarised below (refer to **Appendix G** for more details).

7.6.1. Results of the Heritage and Palaeontological Impact Assessment

Cultural Landscape and the Built Environment

The area proposed for development possesses a number of cultural landscape qualities and elements which

are outlined below:

- The location of the site on the south-central Plateau of the Great Karoo, separated from the Karoo vlakte by the Great Escarpment, characterised by a combination of flat open plains punctuated by mountains and koppies. Parallel valley-ridge systems.
- The folded quality of the landscape - open plains interrupted by ridges and koppies - a function of its geology, semi-arid conditions and low vegetation cover; a relatively ephemeral pattern of human intervention on the landscape resulting in a sense of remoteness and stillness, known also for its night sky.
- A widespread archaeological signature dating to the Earlier and Middle Stone Ages described as a low frequency ancient scatter across the landscape, as well as an archaeological signature dating to the Later Stone Age. In this case, dense archaeology around the dolerite koppies.
- Historical associations with colonial expansion of the northern frontier zone in the late 18th early 19th century resulting in the further displacement of transhumant pastoralism by settled agriculture and the emergence of extensive sheep farming in the early to mid-19th century; the farms Kruidfontein (pre-1890), Poortjie and Louws Baken (pre-1829), being first surveyed during this period.
- A distinctive pattern of settlement informed by access to limited water resources with small, isolated farmsteads forming green oases in the semi-arid landscape, sheltered from the heat by exotic trees and associated with springs, streams, dams and windpumps. The manner in which homesteads are positioned at the base of hills and koppies forming distinctive topographical settings. The dry-packed stone walls historically used for kraals, are a characteristic feature of the landscape.
- The N1 corridor following the alignment of the late 18th century route to the interior and its role as a structuring element in the landscape along which dispersed settlement has occurred like "beads on a string".
- Nelspoort, significant for its wealth of tangible remains demonstrating a continuous history of occupation from pre-history, through to its mid-19th century role in the local wool farming boom, and development as a 20th century medical sanctuary.
- Poortjie Wes, significant as an identified place on an early linkage route between Beaufort West and Graaf Reinet.

The following elements of cultural significance fall within the cadastral boundaries affected by the proposed Poortjie Wes grid connection development, and their spatial relationship with the proposed development is significant:

- Places (towns and settlements) including Nelspoort (Graded IIIB) and its railway station (Grade IIIC) and Poortjie Wes Settlement (Grade IIIA).
- Farmsteads including Montana (Grade IIIB), Poortjie Wes (Grade IIIA), Louws Baken (Grade IIIB) and Kruidfontein (Grade IIIB).
- Rivers, dams and water furrows including Salt River, Bufflesrivier and Poortjie Dam.
- Mountain ridges and peaks which contribute to the cultural landscape including Nelspoort Koppie, Waayfontein ridge running north of and parallel to Nelspoort-Murraysburg valley, Montana ridge and Three koppies (Saalberg, Katjiesberg, Gifkop).
- Movement routes and views experienced from the routes including the Nelspoort road extension from the N1 and the Nelspoort Murraysburg linkage route.
- 20th century communications and electrical infrastructure.

Archaeology

A number of observations were made during the field assessment and the bulk of these were open site scatters of Middle Stone Age cores, flakes and debitage. Local siltstones and hornfels rock cores had been used in the production of the flakes with little introduction of exotic stone sourced in other regions. While only a handful of flakes were found dispersed across a very wide area, they form a constant backdrop to the landscape rather than being concentrated particularly in any one area. The MSA materials tended to be heavily patinated and weathered by water and mud runoff after storms with a high clay content. Typologically diagnostic artefacts included some radial cores and a fairly common spread of retouched blades and blade blanks. Earlier MSA material was also found such as bifacial points and larger flakes but we would deduce that most of this layer of occupation is buried on the floodplains.

Most of the scatters recorded were graded as not conservation-worthy due to the ubiquity of these artefacts across the landscape and the lack of a particular focal point of landscape use. The development of grid connection infrastructure in this area will have negligible impact on the archaeological record in the area as long as the sensitive areas containing engravings and their associated artefact assemblages are avoided.

Palaeontology

The area proposed for development is underlain by potentially fossiliferous sedimentary rocks of the Teekloof Formation (Lower Beaufort Group, Karoo Supergroup) of Late Permian age. While a sparse scatter of previously recorded vertebrate fossil sites are known in the wider region, it is not known if any of these fall within the area currently under consideration. Based on the recent 3-day palaeontological site visit, the great majority of the development area is mantled by thick superficial deposits (alluvium, colluvium / eluvium, calcrete, soils) of low palaeosensitivity. Apart from occasional invertebrate trace fossils of limited scientific interest, the small number of tetrapod fossils recorded from Lower Beaufort Group bedrocks here comprise reworked, fragmentary bones preserved within channel basal breccias or weathered-out into surface gravels. No well-preserved, articulated postcrania or identifiable skull material of high scientific or conservation significance was recorded, although there is still potential for such material occurring at or beneath the surface within the sites. It is concluded that all six solar site options and the proposed grid development area are in practice of Low Palaeosensitivity overall. The preliminary Low to Very High palaeosensitivity sensitivity mapped here by the DFFE Screening Tool is therefore *contested*.

7.6.2. Description of Heritage Impacts

The proposed grid connection falls within the Nelspoort Murraysberg Valley Landscape Character Area. For this Landscape Character Area, it is recommended that a 250m buffer be implemented around the Waayfontein Ridgeline to conserve the integrity of the contribution of this distinctive ridge to the valley. Furthermore, the position of the proposed development immediately adjacent to an historic linkage route will detract from the significant sense of place within this valley.

The landscape character of the northern escarpment is particularly striking, imposing and distinctive. It is also accessible to the public and dominates that portion of the Nelspoort-Murraysburg linkage route. To avoid visual clutter and the sense of overwhelming the landscape experience with infrastructure, ideally:

1. Grid and other infrastructure should be concentrated to the south side of the road.
2. Grid connections should not follow both sides of the road simultaneously.

3. Road crossings associated with the grid connection infrastructure should be concentrated to the west side, in the broader valley area, consolidating with the existing grid road crossings.

7.6.3. Assessment of Potential Impacts

Nature: Impact table for Cultural Landscape Heritage Resources for the proposed Grid connection The broader context of the area proposed for development has cultural significance that may be impacted by the proposed development				
		Before Mitigation		**After Mitigation**
Magnitude	**H (8)**	The position of the proposed grid connection across and adjacent to an historic linkage route will detract from the significant sense of place within this valley	**L (4)**	The position of the proposed grid connection adjacent to an historic linkage route will detract from the significant sense of place within this valley
Duration	**H (4)**	Where manifest, the impact will be long term - for the duration of the grid infrastructure lifetime	**H (4)**	Where manifest, the impact will be long term - for the duration of the grid infrastructure lifetime
Extent	**H (5)**	Regional	**H (5)**	Regional
Probability	**H (5)**	Significant cultural landscape resources will be impacted	**L (2)**	It is unlikely that any significant cultural landscape resources will be impacted
Significance	**L**	(8+4+5)x5=85	**L**	(5+4+4)x2=26
Status		Negative		Neutral
Reversibility	**L**	Any impacts to heritage resources that do occur are reversible once the PV infrastructure is removed	**L**	Any impacts to heritage resources that do occur are reversible once the PV infrastructure is removed
Irreplaceable Loss of Resources?	**L**	Likely	**L**	Unlikely
Can Impacts Be Mitigated		Yes		
Mitigation: » The Grid and other infrastructure should be concentrated to the south side of the road. » The Grid connections should not follow both sides of the road simultaneously. » The road crossings associated with the grid connection infrastructure should be concentrated to the west side, in the broader valley area, consolidating with the existing grid road crossings.				
Residual Risk: None				

Nature: Impact table for Archaeological Heritage Resources The area proposed for development is known to conserve heritage resources of archaeological significance that may be impacted by the proposed development				
		Before Mitigation		**After Mitigation**
Magnitude	**L (2)**	No significant archaeological resources were identified within the development area	**L (2)**	No significant archaeological resources were identified within the development area
Duration	**H**	Where manifest, the impact will be	**H (5)**	Where manifest, the impact will be

	(5)	permanent.		permanent.
Extent	**L (1)**	Localised within the site boundary	**L (1)**	Localised within the site boundary
Probability	**L (1)**	It is extremely unlikely that any significant archaeological resources will be impacted	**L (1)**	It is extremely unlikely that any significant archaeological resources will be impacted
Significance	**L**	(2+5+1)x1=8	**L**	(2+5+1)x1=8
Status		Neutral		Neutral
Reversibility	**L**	Any impacts to heritage resources that do occur are irreversible	**L**	Any impacts to heritage resources that do occur are irreversible
Irreplaceable Loss of Resources?	**L**	Unlikely	**L**	Unlikely
Can Impacts Be Mitigated		Not required		
Mitigation: Should any significant archaeological resources be uncovered during the course of the construction phase, work must cease in the area of the find and SAHRA must be contacted regarding an appropriate way forward.				
Residual Risk: Should any significant archaeological resources be impacted (however unlikely) residual impacts may occur, including a negative impact due to the loss of potentially scientific cultural resources				

Nature: Impact table for Palaeontological Heritage Resources

The area proposed for development is known to conserve heritage resources of palaeontological significance that may be impacted by the proposed development

		Before Mitigation		**After Mitigation**
Magnitude	**H (8)**	No highly significant palaeontological resources were identified within the development area, however the geology underlying the development area is sensitive for impacts to significant fossils	**H (8)**	No highly significant palaeontological resources were identified within the development area, however the geology underlying the development area is sensitive for impacts to significant fossils
Duration	**H (5)**	Where manifest, the impact will be permanent.	**H (5)**	Where manifest, the impact will be permanent.
Extent	**L (1)**	Localised within the site boundary	**L (1)**	Localised within the site boundary
Probability	**H (5)**	It is extremely likely that significant palaeontological resources will be negatively impacted	**L (1)**	It is extremely unlikely that any significant paleontological resources will be negatively impacted
Significance	**H**	(1+5+8)x5=70	**L**	(1+5+8)x1=14
Status		Neutral		Neutral
Reversibility	**L**	Any impacts to heritage resources that do occur are irreversible	**L**	Any impacts to heritage resources that do occur are irreversible
Irreplaceable Loss of Resources?	**H**	Likely	**L**	Unlikely
Can Impacts Be Mitigated		Yes		
Mitigation: The attached Chance Fossil Finds Procedure must be implemented for the duration of construction activities				

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

7.6.4. Implications for Project Implementation

The site forms part of an intact cultural landscape representative of the Central Plateau of the Great Karoo possessing heritage value for historical, aesthetic, architectural, social and scientific reasons. The site possesses a number of landscape elements contributing to a composite cultural landscape including topographical features, open plains, water features, historic scenic routes and farmsteads. The area proposed for development is located within the Juriesfontein Murraysberg Landscape Character Area and in order to mitigate the anticipated negative impact to the historic access route, various recommendations are made.

No archaeological resources of significance were identified within the area proposed for development although the broader area has archaeological significance in terms of the sensitive dolerite outcrops in the broader area. No further mitigation is recommended.

No observations of palaeontological significance were noted within the area proposed for development. However, the geology underlying the development area remains sensitive for impacts to significant palaeontological heritage.

Based on the outcomes of the Heritage study, it is not anticipated that the proposed development of the grid connection infrastructure will negatively impact on significant heritage resources. The following recommendations are made:

- The recommendations of the VIA must be implemented.
- The Grid and other infrastructure should be concentrated to the south side of the road and should not follow both sides of the road simultaneously.
- TheGrid road crossings should be concentrated to the west side, in the broader valley area, consolidating with the existing grid road crossings
- The area proposed for development is located within the Juriesfontein Murraysberg Landscape Character Area and in order to mitigate the anticipated negative impact to the historic access route, a minimum buffer of 500m is recommended between the proposed Grid infrastructure (Option A and the associated 132kV powerline) and the road.
- The HWC Chance Fossil Finds Procedure must be implemented for the duration of construction activities
- Although all possible care has been taken to identify sites of cultural importance during the investigation of the study area, it is always possible that hidden or subsurface sites could be overlooked during the assessment. If any evidence of archaeological sites or remains (e.g. remnants of stone-made structures, indigenous ceramics, bones, stone artefacts, ostrich eggshell fragments, charcoal and ash concentrations), fossils, burials or other categories of heritage resources are found during the proposed development, work must cease in the vicinity of the find and HWC must be alerted immediately to determine an appropriate way forward.

There are limited impacts anticipated to archaeological and palaeontological heritage from this proposed development and as such, the principle of grid connection infrastructure in this location is supported from a heritage perspective as the infrastructure is located in an area able to tolerate this

impact. Therefore no preference (Option A or Option B) was given to the preferred alternative in terms of heritage sensitivities.

7.7 Assessment of Visual Impacts

The visual assessment of the proposed Poortjie Wes Cluster Grid Connection indicates that the construction and operation of the proposed infrastructure will have a visual effect on both the rural landscape and on sensitive receptors in the study area. Overall, the post mitigation significance of the visual impacts is predominately moderate to low. A high significance rating is anticipated for users travelling along the secondary roads and residents of dwellings within 0.5 km from the proposed infrastructure. However, due to the low number/ density of homesteads/dwellings within the study area and the fact that observers travelling along the secondary road will only experience a visual intrusion for a short period of time, this impact is anticipated to be greatly reduced (refer to **Appendix H** for more details).

7.7.1. Results of the Visual Impact Assessment

Viewer incidence, perception and sensitivity

Since the number of potential sensitive receptors and their perception of the development in question ultimately determines the concept of a visual impact (i.e. without receptors there would be no impact), the visual distance theory and the receptors proximity to the development works hand in hand and is especially relevant when considered from areas with a high viewer incidence and a potentially negative visual perception of the proposed facility. It is, therefore, necessary to identify areas of high viewer incidence and to classify certain areas according to the observer's visual sensitivity towards the Poortjie Wes Cluster Grid.

Viewer incidence is calculated to be the highest along the secondary roads within the study area, as well as homesteads/dwellings within the area. Commuters and tourists (though unlikely) using these roads may be negatively impacted upon by the visual exposure to the proposed infrastructure.

Homesteads and farmsteads, by virtue of their visually exposed nature, are also considered to be sensitive visual receptors. Residential receptors in natural contexts are more sensitive than those in more built-up contexts, due to the absence of visual clutter in these undeveloped and undisturbed areas. Receptors within built up areas are less sensitive to potential visual impact due to the presence of structures, infrastructure and general visual clutter. However, due to the extremely low density of homesteads/dwellings within the immediate area (within 1 Km), it is highly unlikely that any residents would be negatively impacted.

No specific report can be made on viewer perception regarding the proposed Poortjie Wes Cluster Grid Connection, as no reported stakeholder feedback has been received by the specialist. However, considering there are existing high voltage power lines traversing the study area and the low number of sensitive visual receptors, an overall neutral perception is anticipated.

The potential sensitive visual receptors within a 0.5km, 1.5km and 3km radius are as follows:

< 0.5km – Short Distance

- Observers travelling along the secondary road and residents of unknown dwellings/homesteads.

0.5 – 1.5km – Short to Medium Distance

- Residents of Hamelkuil and observers travelling along the secondary road.

1.5 - 3km – Medium to Long Distance

» Residents of Bruinrug, as well as observers travelling along the secondary roads.

3km – Long Distance

» Residents homesteads/dwellings within the area, along with observers travelling along the secondary roads.

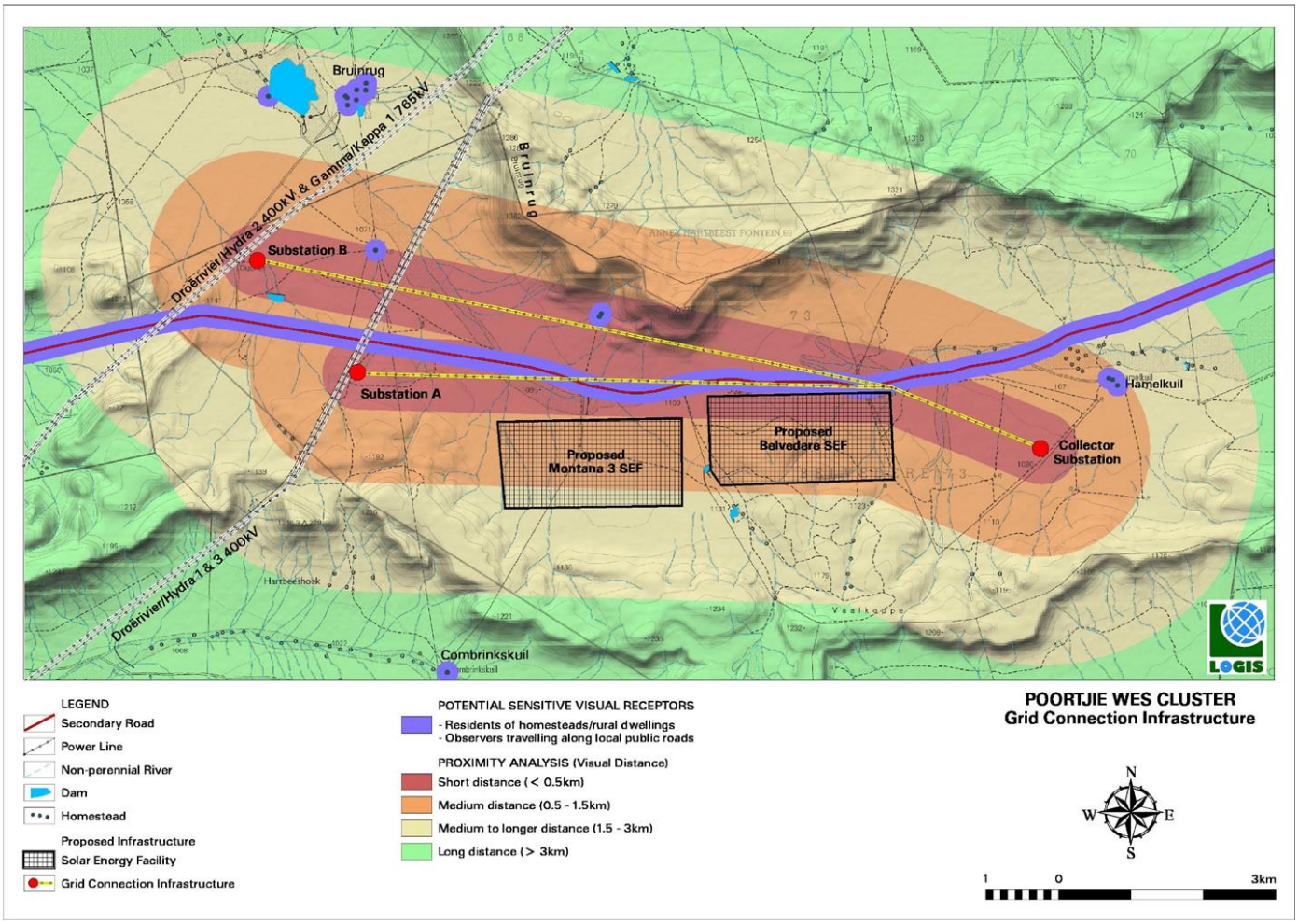


Figure 7.3: Visual proximity analysis of the proposed Poortjie Wes Cluster Grid Connection

Visual absorption capacity

Visual Absorption Capacity (VAC) is the capacity of the receiving environment to absorb the potential visual impact of the proposed infrastructure. VAC is primarily a function of the vegetation and will be high if the vegetation is tall, dense and continuous. Conversely, low growing sparse and patchy vegetation will have a low VAC. The VAC would also be high where the environment can readily absorb the development in terms of texture, colour, form and light / shade characteristics. On the other hand, the VAC for a development contrasting markedly with one or more of the characteristics of the environment would be low. The VAC also generally increases with distance, where discernible detail in visual characteristics of both environment and development decreases.

The land cover within the study area is predominately low shrubland and bare rock and soil with small scattered areas of dryland agriculture and exotic plantations. As a result, the landscape is characterised by wide-open expanses of extreme isolation. Overall, the Visual Absorption Capacity (VAC) of the receiving

environment is deemed to be low by virtue of the low growing vegetation and sparsely populated/limited development overall.

The significant height of power line structures adds to the potential visual intrusion of the power lines, with the tall towers (pylons) against the background of the horizon. In addition, the scale and form of the structures mean that it is unlikely that the environment will visually absorb them in terms of texture, colour, form and light/shade characteristics.

Overall, the Visual Absorption Capacity (VAC) of the receiving environment and the areas in close proximity to the proposed substations and powerline alignments is deemed to be low by virtue of the low-growing vegetation.

Where homesteads do occur, some more significant vegetation and trees may have been planted, which would contribute to the visual absorption. As this is not a consistent occurrence and majority of the settlements are informal in nature, VAC will not be considered for any of the homesteads or settlements, again assuming a worst-case scenario.

As a result of the low-lying vegetation, undeveloped nature of the study area, and the high contrast of the infrastructure within the surrounding receiving environment, VAC will not be considered for the visual impact assessment of the Poortjie Wes Cluster Grid Connection infrastructure.

An analysis has been undertaken within the proposed development corridor in order to determine the general visual exposure (visibility) of the area under investigation. A generic height of 36m was used in order to illustrate the anticipated visual exposure of the proposed infrastructure (i.e. the maximum height of the power line structures). The visibility analysis for each alignment was generated from a number of points along the alignment, spaced at intervals of approximately 400m. Receptor height was set at eye level.

The height of the substations will not exceed two storeys (i.e. 6m), therefore the visual exposure of this component will fall within the viewshed generated for the power line alignment.

The viewshed analysis does not include the effect of vegetation cover or existing structures on the exposure of the proposed facility, therefore signifying a worst-case scenario.

Potential visual exposure

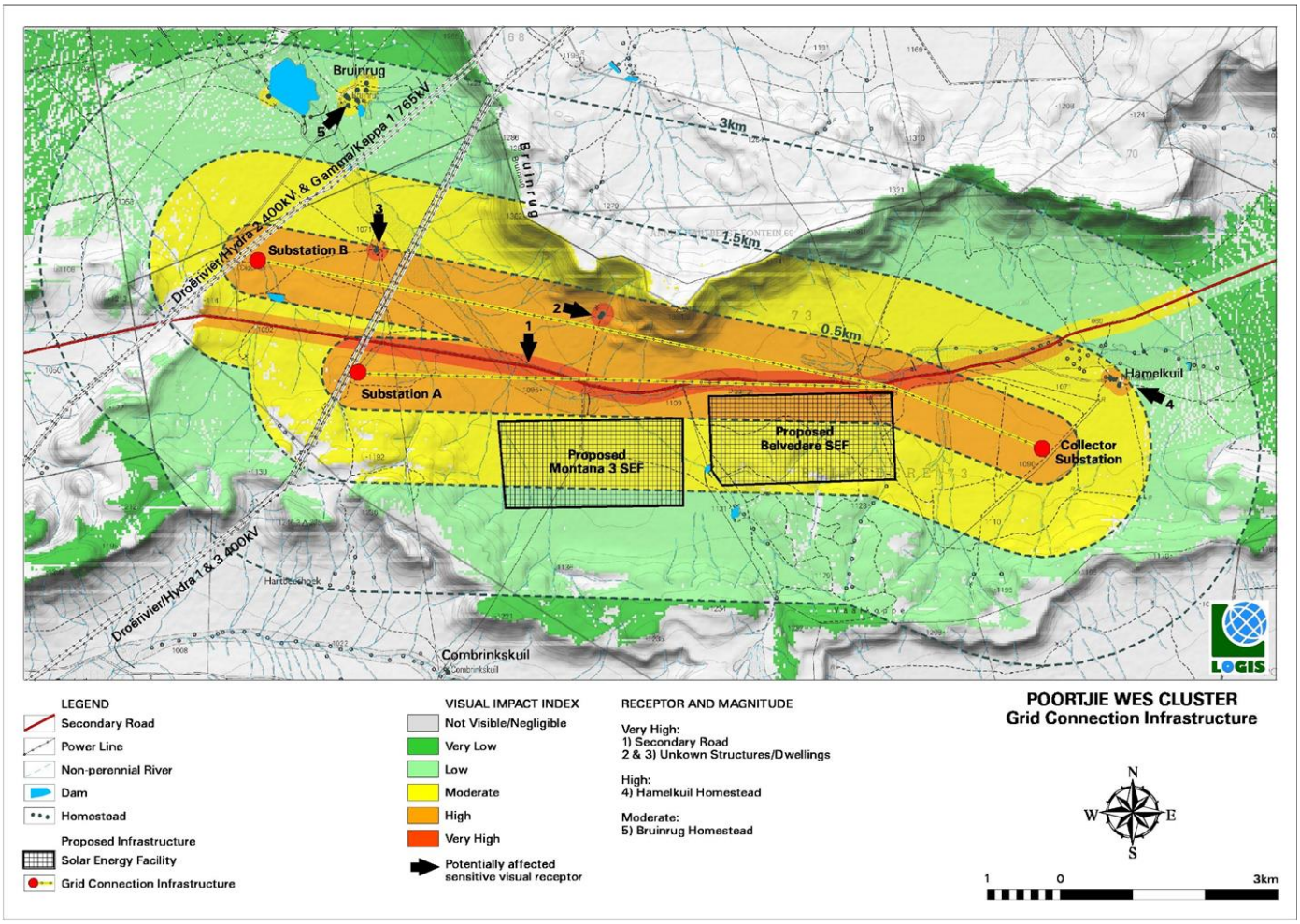
The proposed grid connection infrastructure will be visually exposed to some extent within the study area, due to the tall power line infrastructure. It is thus anticipated that the infrastructure would be visible to observers (i.e. people travelling along roads, residing in homesteads or visiting the region), and could potentially constitute a high visual prominence, potentially resulting in a visual impact.

The following is an overview of the findings of the viewshed (refer to **Figure 7.4**) based on the layout illustrated on the Map provided:

- The potential visual exposure of the infrastructure is contained to a core area on the site itself and within a 0.5 km radius thereof.
- Sensitive visual receptors are observers travelling along the secondary road and residents of unknown dwellings/homesteads.

» Potential visual exposure in the short to medium distance (i.e. between 0.5 and 1.5km), is concentrated throughout this radius with small pockets of visually screened areas to the south west and north owing to the Bruinrug mountain.
» Sensitive visual receptors include residents of Hamelkuil and observers travelling along the secondary road
» In the medium to long distance (i.e. between 1.5 and 3km offset), the extent of potential visual exposure is reduced largely owing to the hilly and mountainous topography. Visually exposed areas are found to the north east, east, south, south west and north west with large areas to the north, south east, south west and west being visually screened.
» Sensitive visual receptors include residents of Bruinrug, as well as observers travelling along the secondary roads.
» Beyond the 3km offset from the proposed facility, potential visual exposure becomes extremely scattered and very low. Sensitive visual receptors are not likely to be visually exposed to the proposed facility, despite lying within the viewshed.

In general, as a result of the scattered and lower population density of the study area, the Poortjie Wes Cluster Grid Connection may constitute a visual prominence, potentially resulting in a moderate- low visual impact.



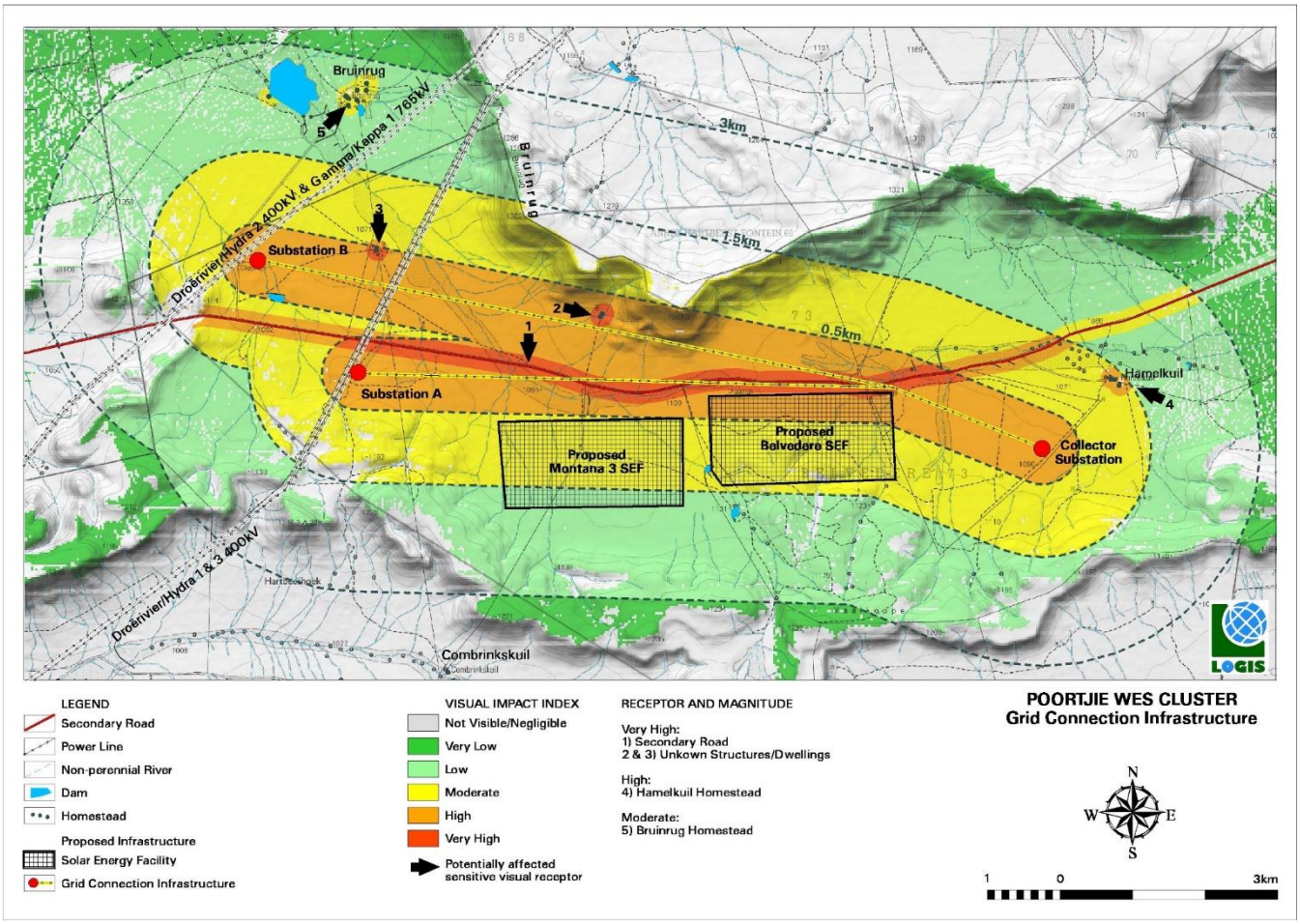


Figure 7.4: Visibility index illustrating the frequency of exposure for the proposed Poortjie Wes Cluster Grid Connection

7.7.2. Description of Visual Impacts

The following impacts have been identified and assessed as part of the visual impact assessment:

- Potential visual impact on sensitive visual receptors in close proximity to the proposed infrastructure
- Potential visual impact on sensitive visual receptors within the region
- Potential visual impact of associated infrastructure on sensitive visual receptors in close proximity
- Potential visual impact of construction on sensitive visual receptors in close proximity to the proposed infrastructure
- Potential visual impact of lighting at night on sensitive visual receptors in the region
- Potential visual impact on the visual character of the landscape and sense of place of the region

7.7.3. Assessment of Potential Impacts

Nature of Impact: Potential visual impact on sensitive visual receptors in close proximity to the proposed infrastructure Visual impact on the users of secondary roads and residents of homesteads in close proximity to the proposed infrastructure.		
	No mitigation	**Mitigation considered**
Extent	High **(4)**	N/A
Duration	Long term **(4)**	N/A

Magnitude	Very high **(10)**	N/A
Probability	Highly probable **(4)**	N/A
Significance	**High (72)**	**N/A**
Status (positive or negative)	Negative	N/A
Reversibility	Recoverable **(3)**	N/A
Irreplaceable loss of resources?	No	N/A
Can impacts be mitigated?	No	

Mitigation / Management:

Planning:

» Respond to the natural environment during the planning of buildings and infrastructure.
» Consolidate development and make use of already disturbed sites rather than pristine areas.
» Retain / re-establish and maintain natural vegetation in all areas outside of the development footprint.
» Wherever possible, use materials, coatings, or paints that have little or no reflectivity.
» Commercial messages, symbols and/logos are not permitted on structures.
» Use slight variations in topography to screen PV panels, where possible. Design linear features to follow natural land contours rather than straight lines.

Construction:

» Ensure that vegetation is necessarily removed during the construction period.
» Reduce the construction period through careful logistical planning and productive implementation of resources.
» 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 site and existing access roads.
» Ensure that rubble, litter, and disused construction materials are appropriately stored (if not removed daily) and then disposed 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 impacts:

None, provided that rehabilitation works are carried out as specified.

Nature of Impact: Potential visual impact on sensitive visual receptors within the region

Visual impact on the residents of farm and homesteads and users of secondary road on the periphery of the 0.5km offset and within the region beyond

	No mitigation	**Mitigation considered**
Extent	Low **(2)**	N/A
Duration	Long **(4)**	N/A
Magnitude	Moderate **(6)**	N/A
Probability	Probable **(3)**	N/A
Significance	**Moderate (36)**	**N/A**
Status (positive or negative)	Negative	N/A
Reversibility	Recoverable **(3)**	N/A
Irreplaceable loss of resources?	No	N/A
Can impacts be mitigated?	Yes	

Mitigation / Management:

Planning:

» Respond to the natural environment during the planning of buildings and infrastructure.
» Consolidate development and make use of already disturbed sites rather than pristine areas.
» Retain / re-establish and maintain natural vegetation in all areas outside of the development footprint.

» Wherever possible, use materials, coatings, or paints that have little or no reflectivity.
» Commercial messages, symbols and/logos are not permitted on structures.
» Use slight variations in topography to screen PV panels, where possible. Design linear features to follow natural land contours rather than straight lines.

Operations:

» Retain / re-establish and maintain natural vegetation in all areas outside of the development footprint.
» Maintain the general appearance of the facility as a whole.
» Monitor rehabilitated areas and implement remedial action as and when required.

Decommissioning:

» Remove infrastructure not required for the post-decommissioning use of the site.
» Rehabilitate all areas. Consult an ecologist regarding rehabilitation specifications.
» Monitor rehabilitated areas post-decommissioning and implement remedial actions.

Residual impacts:
The visual impact will be removed after decommissioning, provided the facility and ancillary infrastructure is removed. Failing this, the visual impact will remain.

Nature of Impact: potential visual impact of associated infrastructure on sensitive visual receptors in close proximity
Visual impact of the associated infrastructure located on site on residents of farm and homesteads and users of the secondary road within close proximity to the proposed facility (within the 0.5 Km offset)

	No mitigation	**Mitigation considered**
Extent	High **(4)**	High **(4)**
Duration	Long **(4)**	Long **(4)**
Magnitude	Very High **(10)**	Moderate **(3)**
Probability	Probable **(3)**	Improbable **(2)**
Significance	**Moderate (54)**	**Low (22)**
Status (positive or negative)	Negative	Negative
Reversibility	Recoverable **(3)**	Recoverable **(3)**
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	Yes	

Mitigation / Management:

Site development & Operation:

» Retain / re-establish and maintain large trees, natural features and noteworthy natural vegetation in all areas outside of the activity footprint.
» Retain / re-establish and maintain natural vegetation in all areas outside of the development footprint.
» Plan ancillary infrastructure in such a way and in such a location that clearing of vegetation is minimised. Consolidate existing infrastructure as much as possible and make use of already disturbed areas rather than pristine sites wherever possible.
» Use existing roads wherever possible. Where new roads are required, these should be planned carefully, taking due cognisance of the local topography. All efforts should be employed to try and align roads along the landscape contours wherever possible. Construction of roads should be undertaken properly, with adequate drainage structures in place to forego potential erosion problems.
» Keeping infrastructure at minimum heights.
» Introducing landscaping measures such as vegetating berms.
» Avoid the use of highly reflective material.
» Maintain the general appearance of the site as a whole.

Lighting

» Lighting should be kept to a minimum wherever possible.
» Install light fixtures that provide precisely directed illumination to reduce light "spillage" beyond the immediate surrounds of the activity – this is especially relevant where the edge of the activity is exposed to residential properties.
» Wherever possible, lights should be directed downwards to avoid illuminating the sky.

» Avoid high pole top security lighting along the periphery of the site and use only lights that are activated on movement.

Construction:

» Rehabilitate all construction areas, when no longer required.
» Keep vegetation clearing to a minimum.

Operations:

» Retain / re-establish and maintain natural vegetation in all areas outside of the development footprint.
» Maintain the general appearance of the facility as a whole.
» Monitor rehabilitated areas and implement remedial action as and when required.

Decommissioning:

» Remove infrastructure not required for the post-decommissioning use of the site.
» Rehabilitate all areas as per the rehabilitation plan undertaken. Consult an ecologist regarding rehabilitation specifications.
» Monitor rehabilitated areas post-decommissioning and implement remedial actions as required.

Residual impacts:

The visual impact will be removed after decommissioning, provided the facility and ancillary infrastructure is removed. Failing this, the visual impact will remain.

Nature of Impact:

Visual impact of construction on sensitive visual receptors in close proximity to the proposed facility

	No mitigation	**Mitigation considered**
Extent	High **(4)**	High **(4)**
Duration	Short term **(1)**	Short term **(1)**
Magnitude	Very High **(10)**	Low **(4)**
Probability	Probable **(3)**	Improbable **(2)**
Significance	**Moderate (45)**	**Low (18)**
Status (positive or negative)	Negative	Negative
Reversibility	Recoverable **(3)**	Recoverable **(3)**
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	Yes	

Mitigation / Management:

Lighting

» Lighting should be kept to a minimum wherever possible.
» Install light fixtures that provide precisely directed illumination to reduce light "spillage" beyond the immediate surrounds of the activity – this is especially relevant where the edge of the activity is exposed to residential properties.
» Wherever possible, lights should be directed downwards to avoid illuminating the sky.
» Avoid high pole top security lighting along the periphery of the site and use only lights that are activated on movement.

Construction:

» Keep vegetation removal to a minimum where possible.
» If possible, keep the construction period to a minimum.
» 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 site and existing access roads.
» Ensure that rubble, litter, and disused construction materials are appropriately stored and then disposed regularly at licensed waste facilities.
» Employ 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 as per the rehabilitation plan and schedule.

Decommissioning: » Remove infrastructure not required for the post-decommissioning use of the site. » Rehabilitate all areas as per the rehabilitation plan undertaken. Consult an ecologist regarding rehabilitation specifications. » Monitor rehabilitated areas post-decommissioning and implement remedial actions as required.
Residual impacts: The visual impact will be removed after decommissioning, provided the facility and ancillary infrastructure is removed. Failing this, the visual impact will remain.

Nature of Impact: Potential visual impact of lighting at night on sensitive visual receptors in the region Visual impact of lighting at night on sensitive visual receptors in close proximity to the proposed facility		
	No mitigation	**Mitigation considered**
Extent	High **(4)**	High **(4)**
Duration	Long term **(4)**	Long term **(4)**
Magnitude	High **(8)**	Low **(4)**
Probability	Probable **(3)**	Improbable **(2)**
Significance	**Moderate (48)**	**Low (24)**
Status (positive or negative)	Negative	Negative
Reversibility	Recoverable **(3)**	Recoverable **(3)**
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	Yes	
Mitigation: Planning & operation: » Shield the sources of light by physical barriers (walls, vegetation, or the structure itself). » Limit mounting heights of lighting fixtures, or alternatively use footlights or bollard level lights. » Make use of minimum lumen or wattage in fixtures. » Make use of down-lighters, or shielded fixtures. » Make use of Low-Pressure Sodium lighting or other types of low impact lighting. » Make use of motion detectors on security lighting. This will allow the site to remain in relative darkness, until lighting is required for security or maintenance purposes.		
Residual impacts: The visual impact will be removed after decommissioning, provided the facility and ancillary infrastructure is removed. Failing this, the visual impact will remain.		

Nature of Impact: Potential visual impact on the visual character of the landscape and sense of place of the region Visual impact of the proposed development on the visual quality of the landscape and sense of place of the region		
	No mitigation	**Mitigation considered**
Extent	Low **(2)**	N/A
Duration	Long **(4)**	N/A
Magnitude	High **(8)**	N/A
Probability	Probable **(3)**	N/A
Significance	**Moderate (42)**	**N/A**
Status (positive or negative)	Negative	N/A
Reversibility	Recoverable **(3)**	N/A
Irreplaceable loss of resources?	No	N/A
Can impacts be mitigated?	Yes	
Mitigation / Management: Planning: » Respond to the natural environment during the planning of buildings and infrastructure.		

» Consolidate development and make use of already disturbed sites rather than pristine areas. » Retain vegetation in all areas outside of actual built footprints wherever possible. » Visually break up large bulky buildings into smaller, subtler, less prominent shapes and planes. » Retain / re-establish and maintain natural vegetation in all areas outside of the development footprint. » Plan ancillary infrastructure in such a way and in such a location that clearing of vegetation is minimised. » Use existing roads wherever possible. Where new roads are required to be constructed, these should be planned carefully, taking due cognisance of the local topography. Roads should be laid out along the contour wherever possible and should never traverse slopes at 90 degrees. Construction of roads should be undertaken properly, with adequate drainage structures in place to forego potential erosion problems. » Wherever possible, use materials, coatings, or paints that have little or no reflectivity. » Commercial messages, symbols and/logos are not permitted on structures. » Use slight variations in topography to screen PV panels, where possible. Design linear features to follow natural land contours rather than straight lines. <u>Construction:</u> » Rehabilitate all construction areas. » Ensure that vegetation is not cleared unnecessarily to make way for infrastructure. <u>Operations:</u> » Maintain the general appearance of the facility as a whole. » Monitor rehabilitated areas and implement remedial action as and when required. <u>Decommissioning:</u> » Remove infrastructure not required for the post-decommissioning use of the site. » Rehabilitate all areas. Consult an ecologist regarding rehabilitation specifications. » Monitor rehabilitated areas post-decommissioning and implement remedial actions.
Residual impacts: The visual impact will be removed after decommissioning, provided the facility and ancillary infrastructure is removed. Failing this, the visual impact will remain.

7.7.4. Implications for Project Implementation

This assessment has adopted a risk averse approach by assuming that the perception of most (if not all) of the sensitive visual receptors (bar the landowners of the properties earmarked for the development), would be negative towards the Poortjie Wes Cluster Grid Connection in the region. While still keeping in mind that there are also likely to be supporters of the facility (as a possible employer and income generator in the region) amongst the population of the larger region, but they are largely expected to be indifferent to the construction of the facility and not as vocal in their support for the facility as the detractors thereof.

Therefore, with the information available to the specialist at the time of writing this report, it cannot be empirically determined that the statistical majority of objecting stakeholders were exceeded. If evidence to the contrary surfaces during the progression of the development application, the specialist reserves the right to revise the statement below.

Therefore, the likelihood that the proposed development will be met with concern and objections from some of the affected sensitive receptors in the region, this report cannot categorically state that any of the above conditions were transgressed. As such these visual impacts are not considered to be fatal flaws for a development of this nature particularly due to the remote location of the study area and very low density of visual receptors. It is, therefore, suggested that the proposed Poortjie Wes Cluster Grid Connection, as per the assessed layout be supported from a visual perspective, subject to the implementation of the suggested best practice mitigation measures provided in this report. There was no preference for the preferred alternative for the grid connection in terms of visual sensitivities.

7.8 Assessment of Impacts on Traffic

The development of Poortjie Wes Cluster Grid will have an impact on traffic in the area. A detailed assessment if provided in the specialist report included in **Appendix J.**

7.8.1. Results of the Traffic Impact Assessment

The main access point for the site will be obtained via MR587 which is a gravel road (shown in red in **Figure 7.4**). This section of MR587 is located between the railway crossing in Nelspoort in the west and Murraysburg in the east. It is envisioned that both labour and materials will be transported via this route. The proposed site access road (shown in orange in **Figure 7.4)** is based on an existing gravel veld track. The condition of the road is not known and upgrades (including the provision of drainage infrastructure) might be required along the site access road to ensure it can accommodate abnormal and heavy load vehicles. The proposed access point meets the requirements of horizontal shoulder sight distance to either side. It is, however, recommended that vertical sight distances be verified on site prior to construction.

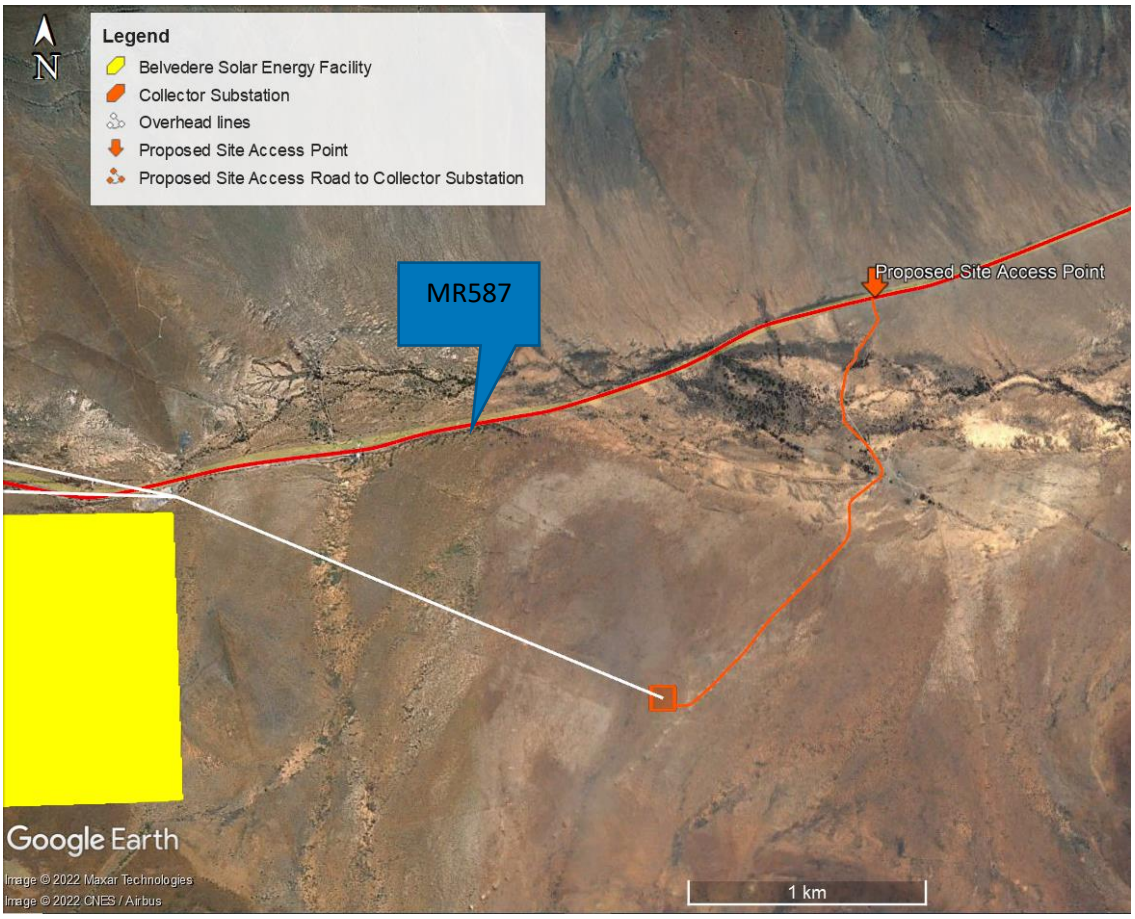


Figure 7.4: Proposed Main and Site Access Roads and Site Access Point for the Belvedere Collector Switching Station

Substation Alternative A:

The main access point for the site will be obtained via MR587 which is an existing provincial gravel road (shown in red in **Figure 7.5**). This section of MR587 is located between the railway crossing in Nelspoort in the west and Murraysburg in the east. It is envisioned that both labour and materials will be transported via this route. The proposed site access road (shown in green in **Figure 7.5)** is based on an existing gravel veld track. The condition

of the road is not known and upgrades (including the provision of drainage infrastructure) might be required along the site access road to ensure it can accommodate abnormal and heavy load vehicles. The proposed access point meets the requirements of horizontal shoulder sight distance to either side. It is, however, recommended that vertical sight distances be verified on site prior to construction.

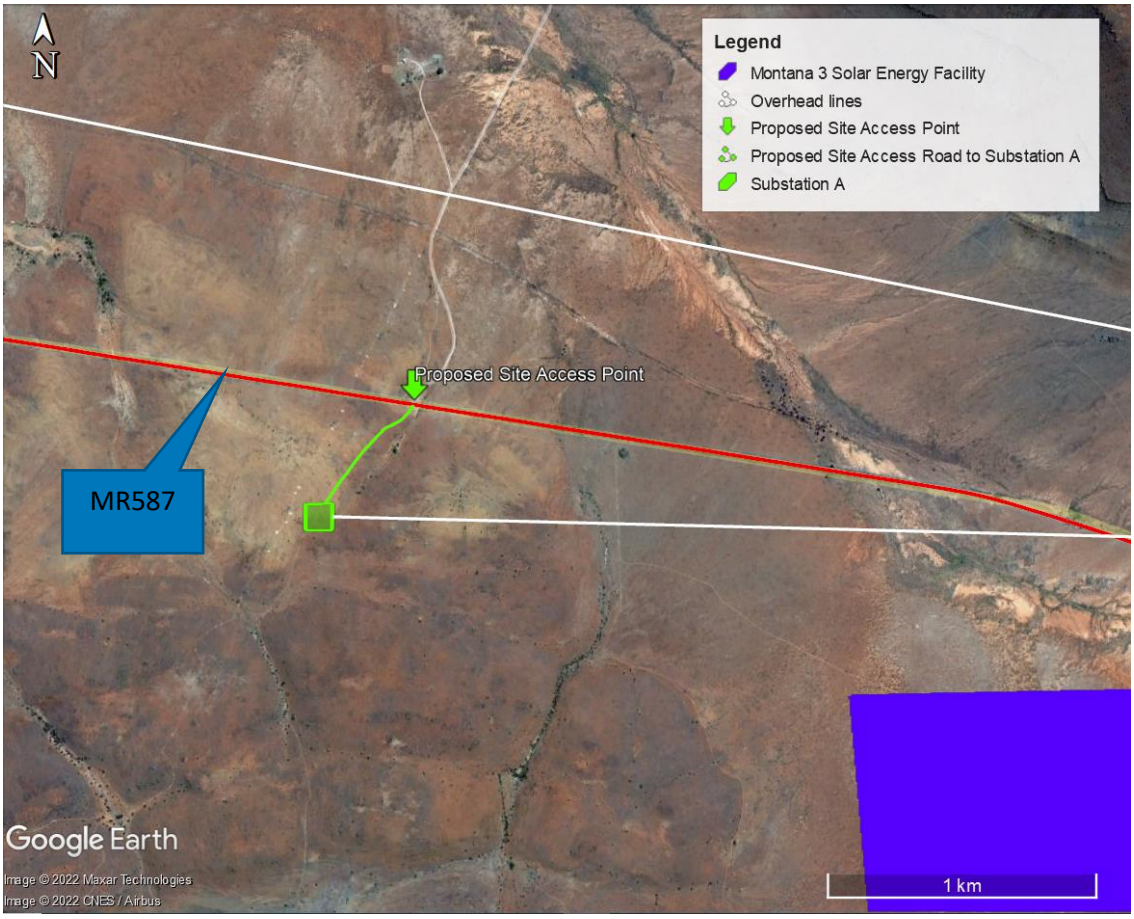


Figure 7.5: Proposed Main & Site Access Roads and Site Access Point for Substation A

Substation Alternative B:

The main access point for the site will be via OP9222 which is an existing provincial gravel road (shown in yellow in **Figure 7.6**). It is envisioned that both labour and materials will be transported via this route. The proposed site access road (shown in cyan in **Figure 7.6)** is approximately 160m in length and will have to be constructed new. The proposed site access road passes under existing overhead power lines. The proposed access point meets the requirements of horizontal shoulder sight distance to either side. It is, however, recommended that vertical sight distances be verified on site prior to construction.

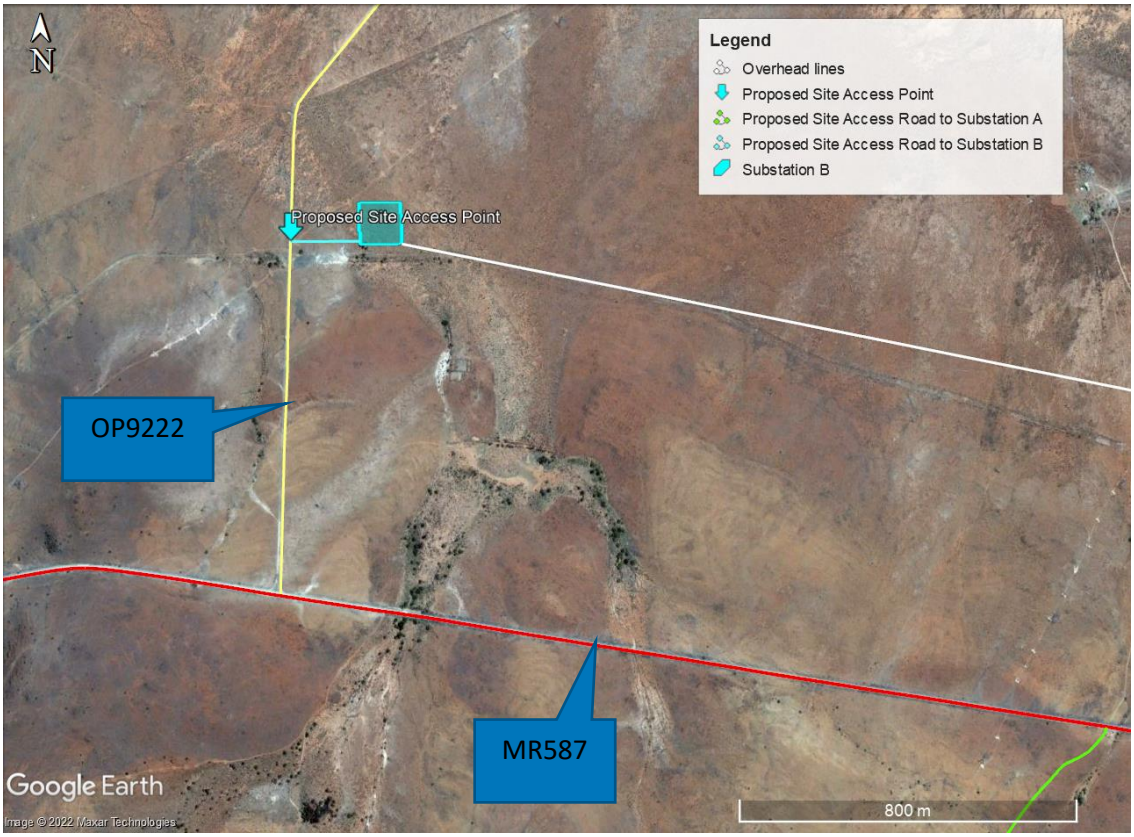


Figure 7.6: Proposed Main & Site Access Roads and Site Access Point for Substation B

The MR587 crosses an existing railway line just south of Nelspoort before continuing to the proposed sites. The Applicant should note that application for wayleaves and permits should be made to the railway authority (Transnet) well in advance of construction commencing. Special safety measures, e.g. access booms might be required to protect drivers of vehicles from oncoming railway traffic, especially in instances of poor visibility and increased traffic flow. All vertical clearances are sufficient, but the height clearances need to physically be verified, especially in the vicinity of overhead power supply at the railway crossing. Should the railway authority not grant permission for the level crossing to be used during construction and operational phases, accessing the site via MR587 from Murraysburg in the east can be considered as an alternative. However, the condition of the road is unknown. There are several drainage paths and streams that cross the road along both approaches, and the condition/capacity of the existing drainage structures need to be verified. Upgrades to the existing drainage infrastructure and/or construction of new infrastructure might be required, and it is recommended that a site visit be conducted to determine the suitability thereof.

7.8.2. Assessment of Potential Impacts

The assessment of impacts and recommendation of mitigation measures as discussed in the specialist report (**Appendix J**) are collated in the tables below.

Nature: Traffic congestion during the construction phase			
Impact description: The impact will occur due to added pressure on the road network due to the increase in traffic associated with the transport of equipment, material and staff to site during the construction phase.			
	Rating	**Motivation**	**Significance**
Prior to Mitigation			

Duration	Very Short-term (1)	The construction period will last between 0.5 – 1 year.	**Medium Negative (36)**
Extent	Local (2)	Pressure will only be added on the local road network.	
Magnitude	Moderate (6)	The increase in traffic will have a moderate impact on traffic operations.	
Probability	Highly Probable (4)	The possibility of the impact on the traffic operations is highly probable.	
Mitigation/Enhancement Measures			
Mitigation: » Stagger component delivery to site. » The use of mobile batching plants and quarries near the site would decrease the impact on the surrounding road network by reducing the construction trips and the distance travelled to transport the materials to the site. » Staff and general trips should occur outside of peak traffic periods. » Regular maintenance of gravel roads by the Contractor during the construction phase and by Client/Facility Manager during operation phase.			
Post Mitigation/Enhancement Measures			
Duration	Very Short-term (1)	The construction period will last between 0.5 – 1 year	**Low Negative (21)**
Extent	Local (2)	Pressure will only be added on the local road network.	
Magnitude	Low (4)	The increase in traffic will have a low impact on traffic operations.	
Probability	Probable (3)	The possibility of the impact on the traffic operations is probable.	
Residual Risks: Traffic will return to normal levels after construction is completed			

Nature: Construction Phase – Air Quality **Air quality will be affected by dust pollution**			
Impact description: The impact will occur due to the increase in construction traffic associated with the transport of equipment, material and staff to site during the construction phase.			
	Rating	**Motivation**	**Significance**
Prior to Mitigation			
Duration	Very Short-term (1)	The construction period will last between 0.5 - 1 year.	**Medium Negative (32)**
Extent	Local (2)	Dust generation will only increase along the local gravel road network.	
Magnitude	Moderate (5)	The increase in traffic will have a moderate impact on dust generation.	
Probability	Highly Probable (4)	The possibility of the impact on the air quality is highly probable.	
Mitigation/Enhancement Measures			
Mitigation: » Dust suppression on gravel roads during the construction phase, as required. » Regular maintenance of gravel roads by the Contractor during the construction phase and by Client/Facility Manager during operation phase.			
Post Mitigation/Enhancement Measures			
Duration	Very Short-term (1)	The construction period will last between 0.5 - 1 year.	**Low Negative (15)**

Extent	Local (2)	Dust generation will only increase along the local gravel road network.	
Magnitude	Minor (2)	Dust suppression measures will result in a low occurrence of air pollution.	
Probability	Probable (3)	The possibility of air pollution is probable.	

Residual Risks:

» Traffic will return to normal levels after construction is completed.
» Dust pollution during the construction phase cannot be completely mitigated but mitigation measures will significantly reduce the impact. Dust pollution is limited to the construction period.

Nature: Construction Phase – Noise Pollution
Noise pollution due to the increase in traffic

Impact description: The impact will occur due to the increase in construction traffic associated with the transport of equipment, material and staff to site during the construction phase.

	Rating	Motivation	Significance
Prior to Mitigation			
Duration	Very Short-term (1)	The construction period will last between 0.5 - 1 year.	**Medium Negative (326)**
Extent	Local (2)	Pressure will only be added on the local road network.	
Magnitude	Moderate (5)	The increase in traffic will have a moderate impact on noise levels.	
Probability	Highly Probable (4)	The possibility of an increase in noise levels due to increased traffic operations is highly probable.	

Mitigation/Enhancement Measures

Mitigation:

» Stagger component delivery to site.
» Reduce the construction period as far as possible.
» The use of mobile batching plants and quarries near the site would decrease the impact on the surrounding road network by reducing the construction trips and the distance travelled to transport the materials to the site.
» Staff and general trips should occur outside of peak traffic periods.

Post Mitigation/Enhancement Measures			
Duration	Very Short-term (1)	The construction period will last between 0.5 - 1 year.	**Low Negative (15)**
Extent	Local (2)	Pressure will only be added on the local road network.	
Magnitude	Minor (2)	The increase in traffic will have a minor impact on noise levels.	
Probability	Probable (3)	The possibility of an increase in noise levels due to increased traffic operations is a distinct possibility.	

Residual Risks:

Traffic will return to normal levels after construction is completed.
Noise pollution during the construction phase cannot be completely mitigated but mitigation measures will significantly reduce the impact. Noise pollution is limited to the construction period.

IMPACT TABLE – OPERATION PHASE

The traffic generated during this phase will be negligible and will not have any impact on the surrounding road network.

IMPACT TABLE – DECOMMISSIONING PHASE
This phase will have the same impact as the Construction Phase i.e. traffic congestion, air pollution and noise pollution, as similar trips/movements are expected.

7.8.3. Implications for Project Implementation

The potential traffic and transport related impacts for the construction and operation phases for the proposed Poortjie Wes Cluster Grid Connection were assessed:

- The traffic generated during the construction phase, although significant, will be temporary and impacts are considered to be negative and of medium significance before and of low significance after mitigation.
- During operation, it is expected that maintenance and security staff will periodically visit the facility. Substations will be unmanned. The traffic generated during this phase will be minimal and will not have an impact on the surrounding road network.
- The traffic generated during the decommissioning phase will be slightly less than the construction phase traffic and the impact on the surrounding road network will also be considered negative and of medium significance before and of low significance after mitigation.

The potential mitigation measures mentioned in the construction phase are:
- Dust suppression
- Component delivery to/ removal from the site can be staggered and trips can be scheduled to occur outside of peak traffic periods.
- The use of mobile batching plants and quarries near the site would decrease the impact on the surrounding road network by reducing the construction trips and the distance travelled to transport the materials to the site.
- Staff and general trips should occur outside of peak traffic periods.
- A "dry run" of the preferred route.
- Design and maintenance of internal roads.
- If required, any low hanging overhead lines (lower than 5.1 m) e.g. Eskom and Telkom lines, along the proposed routes will have to be moved to accommodate the abnormal load vehicles.

The construction and decommissioning phases of a development are the only significant traffic generator and therefore noise and dust pollution will be higher during this phase. The duration of this phase is very short term i.e. the impact of the traffic on the surrounding road network is temporary and a grid connection facility, when operational, does not add any significant traffic to the road network.

Both the proposed access points and the access roads to the sites/facilities are deemed feasible from a traffic engineering perspective, however, vertical sight distances at the proposed access points should be verified on site.

The potential impacts associated with the proposed Poortjies Wes Cluster Grid Connection and associated infrastructure are acceptable from a transport perspective and it is therefore recommended that the proposed facility be authorised provided that the recommendations and mitigations contained in this report are adhered to. Therefore Option A and Option B are considered acceptable for the development of grid infrastructure.

7.9 Assessment of Socio-economic Impacts

The development and operation of Poortjie Wes Cluster Grid will have an impact on social environment of the area. A detailed assessment is provided in the specialist report included in **Appendix I.**

7.9.1. Results of the Socio-economic Impact Assessment

The energy security benefits associated with the proposed Poortjie Wes Cluster are dependent upon it being able to connect to the national grid via the establishment of grid connection infrastructure. This will be facilitated through the proposed Poortjie Wes Cluster Grid.

The findings of the SIA indicate that the significance of the potential negative social impacts for both the construction and operational phase of the proposed grid infrastructure are **Low Negative** with mitigation. The potential negative impacts can therefore be effectively mitigated if the recommended mitigation measures are implemented. The grid infrastructure is also located within the Beaufort West REDZ and Central Transmission Corridor. The establishment of proposed grid infrastructure for the Poortjie Wes Cluster is therefore supported by the findings of the SIA.

In terms of the alternatives considered, Option A transmission line alignment located parallel to the Nelspoort-Murraysburg Road is the preferred option.

7.9.2. Description of Socio-economic Impacts

Impacts are expected to occur with the development of the Poortjie Wes Cluster Grid during the construction, operation and decommissioning phases. Both positive and negative impacts are identified and assessed.

Impacts during construction include:

Positive Impacts:

- Creation of employment and business opportunities.

Negative impacts:

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

Impacts during operation include:

Positive Impacts:

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

Negative Impacts:

- The visual impacts and associated impact on sense of place.
- Loss of farm land and impact on farming operations.
- Impact of maintenance activities on farming activities and operations.

Socio-economic impacts during the decommissioning phase are expected to be similar to those that take place during the construction phase.

7.9.3. Assessment of Potential Impacts

Construction Phase Impacts

Nature: Creation of employment and business opportunities during the construction phase		
	Without Enhancement	**With Enhancement**
Extent	Local-Regional (2)	Local – Regional (2)
Duration	Short term (2)	Short term (2)
Magnitude	Low (4)	Low (4)
Probability	Probable (3)	Highly probable (4)
Significance	**Low (24)**	**Medium (32)**
Status	Positive	Positive
Reversibility	N/A	N/A
Irreplaceable loss of resources?	N/A	N/A
Can impact be enhanced?	Yes	

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

Employment

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

Business

- The proponent should liaise with the BWM with regards the establishment of a database of local companies, specifically BBBEE companies, which qualify as potential service providers (e.g. construction companies, catering companies, waste collection companies, security companies etc.) prior to the commencement of the tender

process for construction contractors. These companies should be notified of the tender process and invited to bid for project-related work.

- Where possible, the proponent should assist local BBBEE companies to complete and submit the required tender forms and associated information.
- The BWM, in conjunction with the local business sector and representatives from the local hospitality industry, should identify strategies aimed at maximising the potential benefits associated with the project.

Note that while preference to local employees and companies is recommended, it is 190aximizing that a competitive tender process may not guarantee the employment of local labour for the construction phase.

Residual impacts:
Improved pool of skills and experience in the local area.

Nature: Potential impacts on family structures and social networks associated with the presence of construction workers

	Without Mitigation	**With Mitigation**
Extent	Local (2)	Local (1)
Duration	Short term (2)	Short term (2)
Magnitude	Minor (2)	Minor (2)
Probability	Highly Probable (4)	Highly Probable (4)
Significance	**Low (24)**	**Low (20)**
Status	Negative	Negative
Reversibility	No in case of HIV and AIDS	No in case of HIV and AIDS
Irreplaceable loss of resources?	Yes, if people contract HIV/AIDS. Human capital plays a critical role in communities that rely on farming for their livelihoods	Yes, if people contract HIV/AIDS. Human capital plays a critical role in communities that rely on farming for their livelihoods
Can impact be mitigated?	Yes, to some degree. However, the risk cannot be eliminated	

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

- Preparation and implementation of a Stakeholder Engagement Plan (SEP) prior to and during the construction phase.
- Preparation and implementation of a Community Health, Safety and Security Plan (CHSSP) prior to and during the construction phase.
- The SEP and CHSSP should include a Grievance Mechanism that enables stakeholders to report resolve incidents.
- Where possible, the proponent should make it a requirement for contractors to implement a 'locals first' policy for construction jobs, specifically for semi and low-skilled job categories.
- The proponent should consider the option of establishing a Monitoring Forum (MF) in order to monitor the construction phase and the implementation of the recommended mitigation measures. The MF should be established before the construction phase commences, and should include key stakeholders, including representatives from local communities, local BWM Councillor, farmers, and the contractor(s). The MF should also be briefed on the potential risks to the local community associated with construction workers.
- The proponent and the contractor(s) should, in consultation with representatives from the MF, develop a code of conduct for the construction phase. The code should identify which types of

behaviour and activities are not acceptable. Construction workers in breach of the code should be dismissed. All dismissals must comply with the South African labour legislation.

- The proponent and the contractor should implement an HIV/AIDS and COVID-19 awareness programme for all construction workers at the outset of the construction phase.
- The construction area should be fenced off before construction commences and no workers should be permitted to leave the fenced off area.
- The contractor should provide transport for workers to and from the site on a daily basis. This will enable the contactor to effectively manage and monitor the movement of construction workers on and off the site.
- Where necessary, the contractors should make the necessary arrangements to enable low and semi-skilled workers from outside the area to return home over weekends and/ or on a regular basis. This would reduce the risk posed to local family structures and social networks.
- The contractor must ensure that all construction workers from outside the area are transported back to their place of residence within 2 days for their contract coming to an end.
- It is recommended that no construction workers, with the exception of security personnel, should be permitted to stay over-night on the site.

Residual impacts:
Impacts on family and community relations that may, in some cases, persist for a long period of time. Also, in cases where unplanned / unwanted pregnancies occur or members of the community are infected by an STD, specifically HIV and or AIDS, the impacts may be permanent and have long term to permanent cumulative impacts on the affected individuals and/or their families and the community.

Nature: Potential risk to safety of farmers and farm workers, livestock and damage to farm infrastructure associated with the presence of construction workers on site

	Without Mitigation	**With Mitigation**
Extent	Local (3)	Local (2)
Duration	Short term (2)	Short term (2)
Magnitude	Medium (6)	Low (4)
Probability	Probable (3)	Probable (3)
Significance	**Medium (33)**	**Low (24)**
Status	Negative	Negative
Reversibility	Yes, compensation paid for stock losses and damage to farm infrastructure etc.	Yes, compensation paid for stock losses and damage to farm infrastructure etc.
Irreplaceable loss of resources?	No	No
Can impact be mitigated?	Yes	

Mitigation:

- Preparation and implementation of a Stakeholder Engagement Plan (SEP) prior to and during the construction phase.
- Preparation and implementation of a Community Health, Safety and Security Plan (CHSSP) prior to and during the construction phase.
- The construction area should be fenced off prior to the commencement of the construction phase. The movement of construction workers on the site should be confined to the fenced off area.
- The proponent should enter into an agreement with the local farmers in the area whereby damages to farm property etc. during the construction phase will be compensated for. The agreement should be signed before the construction phase commences.
- Traffic and activities should be strictly contained within designated areas.
- Strict traffic speed limits must be enforced on the farm.
- All farm gates must be closed after passing through.

- Contractors appointed by the proponent should provide daily transport for low and semi-skilled workers to and from the site. This would reduce the potential risk of trespassing on the remainder of the farm and adjacent properties.
- The proponent should consider the option of establishing a MF (see above) that includes local farmers and develop a Code of Conduct for construction workers. This committee should be established prior to commencement of the construction phase. The Code of Conduct should be signed by the proponent and the contractors before the contractors move onto site.
- The proponent should hold contractors liable for compensating farmers and communities in full for any stock losses and/or damage to farm infrastructure that can be linked to construction workers. This should be contained in the Code of Conduct to be signed between the proponent, the contractors', and neighbouring landowners. The agreement should also cover loses and costs associated with fires caused by construction workers or construction related activities (see below).
- The Environmental Management Plan (EMP) must outline procedures for managing and storing waste on site, specifically plastic waste that poses a threat to livestock if ingested.
- Contractors appointed by the proponent must ensure that all workers are informed at the outset of the construction phase of the conditions contained on the Code of Conduct, specifically consequences of stock theft and trespassing on adjacent farms.
- Contractors appointed by the proponent must ensure that construction workers who are found guilty of stealing livestock and/or damaging farm infrastructure are dismissed and charged. This should be contained in the Code of Conduct. All dismissals must be in accordance with South African labour legislation.
- It is recommended that no construction workers, with the exception of security personnel, should be permitted to stay over-night on the site

Residual impacts:
No, provided losses are compensated for.

Nature: Potential loss of livestock, crops and houses, damage to farm infrastructure and threat to human life associated with increased incidence of grass fires

	Without Mitigation	**With Mitigation**
Extent	Local (4)	Local (2)
Duration	Short term (2)	short term (2)
Magnitude	Moderate due to reliance on agriculture for maintaining livelihoods (6)	Low (4)
Probability	Probable (3)	Probable (3)
Significance	**Medium (36)**	**Low (24)**
Status	Negative	Negative
Reversibility	Yes, compensation paid for stock and crop losses etc.	Yes, compensation paid for stock and crop losses etc.
Irreplaceable loss of resources?	No	No
Can impact be mitigated?	Yes	

Mitigation:

- The proponent should prepare a Community Health, Safety and Security Plan (CHSSP) prior to commencement of the construction phase.
- The proponent should enter into an agreement with the local farmers in the area whereby damages to farm property etc., during the construction phase will be compensated for. The agreement should be signed before the construction phase commences.
- The option of establishing a fire-break around the perimeter of the site prior to the commencement of the construction phase should be investigated.
- Contractor should ensure that open fires on the site for cooking or heating are not allowed except in designated areas.

- Smoking on site should be confined to designated areas.
- Contractor to ensure that construction related activities that pose a potential fire risk, such as welding, are effectively managed and are confined to areas where the risk of fires has been reduced. Measures to reduce the risk of fires include avoiding working in high wind conditions when the risk of fires is greater. In this regard special care should be taken during the high risk dry, windy winter months.
- Contractor should provide adequate fire-fighting equipment on-site, including a fire fighting vehicle.
- Contractor to provide fire-fighting training to selected construction staff. No construction staff, with the exception of security staff, to be accommodated on site overnight.
- As per the conditions of the Code of Conduct, in the advent of a fire being caused by construction workers and or construction activities, the appointed contractors must compensate farmers for any damage caused to their farms. The contractor should also compensate the fire-fighting costs borne by farmers and local authorities.

Residual impacts:
No, provided losses are compensated for.

Nature: Potential noise, dust and safety impacts associated with construction activities and movement of traffic to and from the site

	Without Mitigation	**With Mitigation**
Extent	Local (2)	Local (1)
Duration	Short Term (2)	Short Term (2)
Magnitude	Low (4)	Minor (2)
Probability	Probable (3)	Probable (3)
Significance	**Low (24)**	**Low (15)**
Status	Negative	Negative
Reversibility	Yes	Yes
Irreplaceable loss of resources?	No	No
Can impact be mitigated?	Yes	

Mitigation:

- The proponent should prepare a Community Health, Safety and Security Plan (CHSSP) prior to commencement of the construction phase.
- As far as possible, the transport of components to the site along the N1, N12 and R61 should be planned to avoid weekends and holiday periods.
- The contractor should inform local farmers and representatives from the BWM and relevant provincial road authorities of dates and times when abnormal loads will be undertaken.
- The contractor must ensure that damage caused by construction related traffic to the gravel public roads and local, internal farm roads is repaired on a regular basis throughout the construction phase. The costs associated with the repair must be borne by the contractor.
- Dust suppression measures must be implemented for heavy vehicles such as wetting of gravel roads on a regular basis, adhering to speed limits and ensuring that vehicles used to transport sand and building materials are fitted with tarpaulins or covers.
- All vehicles must be roadworthy, and drivers must be qualified and made aware of the potential road safety issues and need for strict speed limits.
- The Contractor should ensure that workers are informed that no waste can be thrown out of the windows while being transported to and from the site. Workers who throw waste out windows should be fined.
- The Contractor should be required to collect waste along access roads on a weekly basis.
- Waste generated during the construction phase should be transported to the local permitted landfill site.
- EMPr measures (and penalties) should be implemented to ensure farm gates are closed at all times.
- EMPr measures (and penalties) should be implemented to ensure speed limits are adhered to at all times.

Residual impacts:

If damage to local farm roads is not repaired then this will affect the farming activities in the area and result in higher maintenance costs for vehicles of local farmers and other road users. The costs will be borne by road users who were not responsible for the damage.

Operation Phase Impacts

Nature: Development of infrastructure to generate clean, renewable energy		
	Without Enhancement	**With Enhancement**
Extent	Local, Regional and National (3)	Local, Regional and National (3)
Duration	Long term (4)	Long term (4)
Magnitude	Moderate (6)	Moderate (6)
Probability	Highly Probable (4)	Definite (5)
Significance	**Medium (52)**	**High (65)**
Status	Positive	Positive
Reversibility	Yes	
Irreplaceable loss of resources?	N/A	N/A
Can impact be mitigated?	Yes	
Enhancement: Should the project be approved, the proponent should ensure the following: » Implement a skills development and training programme aimed at maximizing the number of employment opportunities for local community members. » Maximise opportunities for local content, procurement, and community shareholding.		
Residual impacts: Overall reduction in CO_2 emission, reduction in water consumption for energy generation, contribution to establishing an economically viable commercial renewables generation sector in the Northern Cape and South Africa.		

Nature: Creation of employment and business opportunities associated with the operational phase		
	Without Enhancement	**With Enhancement**
Extent	Local and Regional (1)	Local and Regional (1)
Duration	Long term (4)	Long term (4)
Magnitude	Minor (2)	Minor (2)
Probability	Probable (3)	Highly Probable (4)
Significance	**Low (21)**	**Medium (32)**
Status	Positive	Positive
Reversibility	N/A	N/A
Irreplaceable loss of resources?	No	No
Can impact be enhanced?	Yes	
Enhancement: Should the project be approved, the proponent should: » Implement a skills development and training programme aimed at maximizing the number of employment opportunities for local community members. » Maximise opportunities for local content, procurement, and community shareholding.		
Residual impacts: Creation of permanent employment and skills and development opportunities for members from the local community and creation of additional business and economic opportunities in the area		

Nature: The generation of additional income represents a significant benefit for the local affected farmer(s) and reduces the risks to their livelihoods posed by droughts and fluctuating market prices for sheep and farming inputs, such as feed etc.

	Without Enhancement	**With Enhancement**
Extent	Local (1)	Local (1)
Duration	Long term (4)	Long term (4)
Magnitude	Minor (2)	Low (4)
Probability	Probable (3)	Highly Probable (4)
Significance	**Low (21)**	**Medium (36)**
Status	Positive	Positive
Reversibility	N/A	N/A
Irreplaceable loss of resources?	No	No
Can impact be enhanced?	Yes	
Enhancement: Implement agreements with affected landowner.		
Residual impacts: Support for local agricultural sector and farming		

Nature: Visual impact associated with the proposed solar facility and the potential impact on the area's rural sense of place and adjacent land uses.		
	Without Mitigation	**With Mitigation**
Extent	Local (1)	Local (1)
Duration	Long term (4)	Long term (4)
Magnitude	Moderate (6)	Moderate (6)
Probability	Probable (3)	Probable (3)
Significance	**Medium (33)**	**Medium (33)**
Status	Negative	Negative
Reversibility	Yes, Grid Infrastructure can be removed.	
Irreplaceable loss of resources?	No	No
Can impact be mitigated?	Yes	
Mitigation: The recommendations contained in the Final VIA should also be implemented		
Residual impacts: Support for local agricultural sector and farming		

Nature: Potential risk to farming operations and livestock associated with presence of maintenance workers on the site		
	Without Mitigation	**With Mitigation**
Extent	Local (2)	Local (1)
Duration	Short term (2)	Short term (2)
Magnitude	Moderate (6)	Low (4)
Probability	Probable (3)	Probable (3)
Significance	Medium (30)	Low (21)
Status	Negative	Negative
Reversibility	Yes, grid infrastructure can be removed.	
Irreplaceable loss of resources?	No	No
Can impact be mitigated?	Yes	
Mitigation: Option A is the preferred transmission line alignment		
Residual impacts:		

No, provided losses are compensated for.

Nature: Potential risk to farming operations and livestock associated with presence of maintenance workers on the site		
	Without Mitigation	**With Mitigation**
Extent	Local (2)	Local (1)
Duration	Short term (2)	Short term (2)
Magnitude	Moderate (6)	Low (4)
Probability	Probable (3)	Probable (3)
Significance	Medium (30)	Low (21)
Status	Negative	Negative
Reversibility	Yes, grid infrastructure can be removed.	
Irreplaceable loss of resources?	No	No
Can impact be mitigated?	Yes	
Mitigation: » Affected property owners should be notified in advance of the timing and duration of maintenance activities. » Maintenance teams must ensure that all farm gates must be closed after passing through. » Property owners should be compensated for damage to farm property and or loss of livestock or game associated maintenance related activities. » Movement of traffic and maintenance related activities should be strictly contained within designated areas associated with transmission lines and substations. » Strict traffic speed limits must be enforced on the farm. » No maintenance workers should be allowed to stay over-night on the affected properties.		
Residual impacts: No, provided losses are compensated for.		

7.9.4. Implications for Project Implementation

The energy security benefits associated with the proposed Poortjie Wes PV SEF Cluster are dependent upon it being able to connect to the national grid via the establishment of grid connection infrastructure.

The findings of the SIA indicate that the significance of the potential negative social impacts for both the construction and operational phase of the proposed grid infrastructure are **Low Negative** with mitigation. The potential negative impacts can therefore be effectively mitigated if the recommended mitigation measures are implemented. The grid infrastructure is also located within the Beaufort West REDZ and Central Transmission Corridor. The establishment of proposed grid infrastructure for the Poortjie Wes PV SEF Cluster is therefore supported by the findings of the SIA.

The owner of Belvedere 73/1 indicated that Option A was the preferred transmission line alignment given that it is located along the Nelspoort-Murraysburg Road corridor. Option B located to the north of the road was not regarded as suitable as it would impact on a portion of the property that is used for seasonal commercial hunting. Potential impacts are related to sense of place/ visual, potential safety restrictions. This would compromise the best hunting area on the property also compromise the camp infrastructure that has been established for commercial hunting in the area. This is pertinent, as another portion of the property would be sterilized to hunting, should the proposed Montana PV 3 facility be constructed (Vivier, pers.

comm). Therefore, option A transmission line alignment located parallel to the Nelspoort-Murraysburg Road is the preferred option.

7.10 Assessment of the 'Do Nothing' Alternative

The 'do-nothing' alternative (i.e., 'no-go' alternative) is the option of not constructing the Poortjie Wes Cluster Grid. This means that the status quo of the environment would remain unchanged, and no additional impacts would occur. All baseline information provided in this report relates to the current situation on site and in the surrounding area and can be considered the 'no-go' alternative. All negative impacts, specifically related to the development of the Poortjie Wes Cluster Grid, discussed in this report will not materialise. In addition, positive impacts identified to be associated with the project will be foregone, including those associated with the six PV facilities proposed as part of the Poortjies Wes Cluster. These are described below.

a) Land use and agriculture

The land capability sensitivity (DAFF, 2017) indicates a range of sensitivities expected throughout the project assessment area, which is predominantly covered with "Very Low" to "Low" sensitivities. Some patches are characterised by "Moderate Low to Moderate" sensitivities. In the assessment area there is no segregation of agricultural lands or crop fields with high potentials. It is also worth noting that, there are limitations on the actual soil field occurrence and distribution as the baseline soil assessment results were not presented. It is the specialist's recommendation that, the proposed Poortjies WES Grid Connection Infrastructure will have limited effects based on the desktop sensitivities and potentials from the DAFF, (2017). Therefore, the project may be favourably considered. Therefore, the current land-use will be retained, while also operating essential infrastructure to cater for the six renewable energy facilities (and potentially other renewable energy facilities planned in the Beaufort West REDZ in future). The impact on agricultural activities as a result of the project is, therefore, expected to be low.

The implementation of the 'do-nothing' alternative would leave the land use restricted to the current livestock grazing, which would result in essential infrastructure (i.e., the 400kV MTS, collector substation and power lines associated with the Poortjie Wes Cluster Grid) to cater for the six renewable energy facilities (and potentially other renewable facilities planned in the Beaufort West REDZ in future) not being established and will, therefore, render the development of the renewable energy facilities and the operation thereof technically unfeasible as the facilities would not be able to connect to the national grid. This will result in the loss of the opportunity to develop the various renewable energy facilities, which could have impacts at a national scale. Therefore, from a land-use perspective, the 'do-nothing' alternative is not preferred as there is a perceived loss of a viable and compatible land use.

The 'do-nothing' alternative would result in a lost opportunity for the country in terms of renewable energy. From this perspective, the 'do-nothing' alternative is not preferred when considering land use and agricultural aspects of the project site. Use of the identified site for the development of the proposed Poortjie Wes Cluster Grid is considered to be a preferred land use as the benefits will outweigh the impacts.

b) Socio-economic impact

The proposed MTS, collector Substation and power lines are essential to enable the six renewable energy facilities (and potentially other renewable energy facilities planned in the Beaufort West REDZ in future) to

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

The socio-economic impacts of the 'do-nothing' alternative are discussed in detail below:

Energy needs: The 'do-nothing' alternative would represent a lost opportunity for South Africa to improve energy security and supplement its current energy needs with renewable energy. Given South Africa's current energy security challenges and its position as one of the highest per capita producers of carbon emissions in the world, this would represent a significant negative social cost. Therefore, from an energy needs perspective, the 'do-nothing' alternative is not preferred as there will be a lost opportunity in the acquisition of energy from a renewable energy resource, which will consequently result in South Africa not being able to address the current supply constraints, as well as failure to reduce their production of carbon emissions on a global scale.

New Business: Some of the positive spin off effects that are to ensue from the project expenditure will be localised in the communities located near the site, such as the towns of Beaufort West and Riebeek East. The local services sector and specifically the trade, transportation, catering and accommodation, renting services, personal services and business services are expected to benefit the most from the project activities during the construction phase. New business sales that will be stimulated as a result of the establishment of the Poortjie Wes Cluster Grid, albeit for a temporary period, will be lost with the implementation of the 'do nothing' alternative. Therefore, from a business perspective, the 'do-nothing' alternative is not preferred as there is a loss of new business opportunities.

Employment: The development of the Poortjie Wes Cluster Grid within the Blue Beaufort West Local Municipality will aid in a reduction of the unemployment rate. However, if the electricity transmission and distribution infrastructure is not developed, the unemployment rate will not be positively influenced. The upliftment and socio-economic benefits for individuals within local communities would be forfeited with the implementation of the 'do-nothing' alternative. Therefore, from an employment perspective, the 'do-nothing' alternative is not preferred as there is a perceived loss of employment opportunities.

Skills development: The establishment of the Poortjie Wes Cluster Grid will offer numerous opportunities for skills transfer and development. This is relevant for both on-site activities and manufacturing activities. Various renewable energy facilities, and their supporting grid infrastructure, are proposed to be developed in the area and in the Western Cape Province, which means that the transfer of skills from foreign experts to the local engineers and construction workers will take place. The skills training and transfer benefits for individuals within local communities would be forfeited with the implementation of the 'do-nothing' alternative.

c) Regional scale impact

At a broader scale, the benefits of supporting additional capacity to the national electricity grid and those associated with the introduction of renewable energy would not be realised should the 'do-nothing' alternative be considered and implemented. Although Poortjie Wes Cluster Grid are only proposed to cater

for the six renewable energy facilities (and potentially other renewable energy facilities planned in the Beaufort West REDZ in future), this infrastructure would assist in meeting the electricity demand throughout the country and would also assist in meeting the government's goal for renewable energy and the energy mix. In addition, the development of the MTS and power lines further supports the growth and investment into grid connectivity nationally. Without the MTS and power lines, the benefits derived from generation of renewable energy sources will not be obtained as the planned renewable energy facilities in the area will not be able to export to the grid. The benefits being lost by virtue of halting renewable energy generation would include:

Increased energy security: Load shedding presents a challenge with regards to reliability and security of supply. Given that renewables can often be deployed in a short timeframe and in a decentralised manner close to consumers, they offer the opportunity for improving grid strength and supply quality in the short-term, while reducing expensive distribution losses. According to the Council for Scientific and Industrial Research's (CSIR) latest published annual statistics on power generation in South Africa for the period 2020, load shedding occurred for 859 hours of the year (9.8%) with an upper limit of 1 798 GWh relative to actually achieved energy shed of 1 269 GWh. An urgent response is therefore necessary to ensure adequate short-term electricity supply and to set South Africa on a path towards long-term adequacy in the 2020s. Eskom's energy availability factor has been on a declining trend since 2001, and after a brief spike in 2016, has continued down this path over the last year (2019-2020).

According to the DoE IPPPP Overview (March 2019), 35 669GWh of energy has been generated by renewable energy sources procured under the REIPPPP since the first project became operational. Renewable energy IPPs have proved to be very reliable. Of the 64 projects that have reached Commercial Operations Date (COD) (as at March 2019), 62 projects have been operational for longer than a year. The energy generated over the period 2018 -2019 for these 62 projects is 10 648GWh, which is 96% of their annual energy contribution projections (P50) of 11 146GWh over a 12-month delivery period. Twenty-eight (28) of the 62 projects (45%) have individually exceeded their P50 projections.

Resource saving: It is estimated that the achievement of the targets in the Renewable Energy White Paper will result in water savings of approximately 16.5 million kilolitres per annum. As an already water-stressed nation, it is critical that South Africa engages in a variety of water conservation measures, particularly due to the detrimental effects of climate change on water availability. Renewable energy also translates into revenue savings, as fuel for renewable energy facilities is free compared to the continual purchase of fuel for conventional power stations. According to the DoE IPPPP Overview (March 2019), water savings of 42.8 million kilolitres has been realised by the programme from inception until the end of March 2019.

Exploitation of our significant renewable energy resource: At present, valuable renewable resources, including biomass by-products, solar radiation and wind power remain largely under-exploited. The use of these energy flows will strengthen energy security through the development of a diverse energy portfolio in South Africa.

By the end of March 2019, the REIPPPP had made the following significant impacts in terms of energy supply:

* 6 422MW of electricity had been procured from 112 Renewable Energy Independent Power Producers (IPPs) in seven bid rounds;
* 3 976MW of electricity generation capacity from 64 IPP projects has been connected to the national grid;

* 35 669 GWh of energy has been generated by renewable energy sources procured under the REIPPPP since the first project became operational. Renewable energy IPPs have proved to be very reliable. Of the 64 projects that have reached commercial operation, 62 projects have been operational for longer than a year. The energy generated over the 12-month period (as of 31 March 2019) for these 62 projects is 10 648 GWh, which is 96% of their annual energy contribution projections of 11 146 GWh over a 12-month delivery period. Twenty-eight (28) of the 62 projects (45%) have individually exceeded their projections.

Pollution reduction: The release of by-products through the burning of fossil fuels for electricity generation has a particularly hazardous impact on human health and contributes to ecosystem degradation. The use of solar radiation or wind for power generation is a non-consumptive use of a natural resource which produces zero emissions during its operation.

Climate friendly development: The uptake of renewable energy offers the opportunity to address energy needs in an environmentally responsible manner and thereby allows South Africa to contribute towards mitigating climate change through the reduction of greenhouse gas (GHG) emissions. South Africa is estimated to be currently responsible for ±1% of global GHG emissions (and circa half of those for which Africa is responsible) and is currently ranked 9th worldwide in terms of per capita carbon dioxide emissions. The overview of the Independent Power Producers Procurement Report (March 2019) indicates that carbon emission reductions of 36.2 Mton CO_2 has been realised by the IPP programme from inception to end of March 2019.

Support for international agreements: The effective deployment of renewable energy provides a tangible means for South Africa to demonstrate its commitment to its international agreements under the Kyoto Protocol and the Paris Agreement, and for cementing its status as a leading player within the international community.

Investment, economic and social impacts: As a result of the excellent resource and competitive procurement processes, both wind power and solar PV power are now proven in South Africa as cheaper forms of energy generation than coal power. They offer excellent value for money to the economy and citizens of South Africa while benefitting society as a whole through the development of clean energy.

The development, procurement, installation, maintenance, and management of renewable energy facilities have significant potential for job creation and skills development in South Africa. The construction phase will create temporary employment opportunities and the operation phase will create limited full-time employment opportunities. The overview of the Independent Power Producers Procurement Report (March 2019) indicates that all IPP projects, as of 31 March 2019, have created 40 134 jobs for South African citizens.

The overview of the Independent Power Producers Procurement Report (March 2019) indicates the following contributions from the REIPPPP projects in terms of investment, socio-economic development, and contributions to enterprise development:

» Investment (equity and debt) to the value of R209.7 billion, of which R41.8 billion (20%) is foreign investment, was attracted;
» Socio-economic development contributions of R860.1 million to date, of which R81.1 million was spent in this 2019 reporting quarter; and

» Enterprise development contributions of R276.7 million to date, of which R26.5 million was spent in this 2019 reporting quarter.

Acceptability to society: Renewable energy offers a number of tangible benefits to society, including reduced pollution concerns, improved human and ecosystem health, the use of clean energy and climate friendly development.

Support to a new industry sector: The development of renewable energy offers the opportunity to establish a new industry within the South African economy, which will create jobs and skill local communities and result in community upliftment for the affected areas.

Protecting the natural foundations of life for future generations: Actions to reduce the disproportionate carbon footprint can play an important part in ensuring the human role in preventing dangerous anthropogenic climate change, thereby securing the natural foundations of life for generations to come; this is the basis of sustainable development.

At present, South Africa is some way off from fully exploiting the diverse gains from renewable energy and from achieving a considerable market share in the renewable energy industry. South Africa's electricity supply remains heavily dominated by coal-based power generation, with the country's significant renewable energy potential largely untapped to date.

The Integrated Resource Plan (IRP) 2019 developed by the Department of Energy indicates that South Africa continues to pursue a diversified energy mix that reduces reliance on a single or a few primary energy sources. Renewable energy, including Solar PV, wind and CSP with storage present an opportunity to diversify the energy mix, to produce grid connected or distributed off-grid electricity. In order to achieve this diversified mix and harness the benefits of renewable energy, the IRP 2019 includes an allocation of 6000MW of new capacity to large scale PV, and a further 6000MW allocated to embedded generation.

The 'do-nothing' alternative would result in the Western Cape Province not benefiting from additional generated power from a renewable source being evacuated through the proposed grid infrastructure directly into the province's grid. There will also be a potential loss for development of renewable energy which is detailed in the local, regional and national policies to be of great importance for economic development. Therefore, from a regional perspective, the 'do-nothing' alternative is not preferred as there is a perceived loss of benefits for the regional area.

7.10.1. Costs and Benefits associated with the Poortjie Wes Cluster Grid

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 generic EMPrs, are implemented and adhered to. No fatal flaws have been identified. These environmental costs could include:

» *Loss of biodiversity, flora and fauna due to the clearing of land for construction* – The proposed development would require vegetation clearing, which would result in the direct loss of vegetation, ecological degradation and direct impacts to fauna. No impacts of high significance post-mitigation were identified, and all impacts can be minimised through the implementation of the recommended mitigation measures.

- *Impacts on birds* – The cost of the loss of habitat and the loss of avifauna due to collision and electrocution is considered high as there are several priority species that can be affected by the proposed 400kV MTS, Collector Substation and power lines. However, impacts can be minimised through the implementation of mitigation measures. No impacts of high significance were identified post-mitigation.
- *Visual impacts associated with the MTS and power lines* – The MTS and associated power lines will be visible from large areas within the study area, due to the generally homogenous terrain within which it is proposed to be located. However, the facility falls within vacant open space generally devoid of observers or potential sensitive visual receptors, and also within an area which is already impacted by similar infrastructure. No mitigation of this impact is possible (i.e., the infrastructure will be visible in the landscape) but general mitigation and management are required as best practise to minimise secondary visual impacts which may arise from mismanagement of the site.

Benefits of the establishment of the Poortjie Wes Cluster Grid include the following:

- The project will cater for six renewable energy facilities, thereby ensuring that the facilities are able to connect to the national grid.
- The project will contribute towards the Provincial and Local IDP objectives for the provision of electricity.
- The project will result in important economic benefits at the local and regional scale through job creation, income, and other associated downstream economic development. These will persist during the pre-construction, construction, operation and decommissioning phases of the project.
- The project provides an opportunity for a new land use on the affected properties, which is considered as a more efficient use of the land.

The benefits of the Poortjie Wes Cluster Grid are expected to occur at a national, regional and local level. If the costs to the environment can be largely limited through the appropriate placement of infrastructure on the project site and assessed corridor, within lower sensitive areas through avoidance of features and areas considered to be sensitive, the benefits of the project are expected to outweigh the environmental costs of the project.

7.10.2. Impacts of the 'Do-Nothing' Alternative

The following impacts are anticipated with the implementation of the 'do-nothing' alternative:

- Failure to support the provision of power generation capacity from clean, renewable energy in accordance with the Department of Mineral Resources and Energy's (DMRE's) National Integrated Resource Plan (IRP).
- Failure to contribute energy to the national electricity grid (should any one of the six renewable energy facilities be selected as Preferred Bidder), which in turn has the opportunity to stimulate economic growth and development, by allowing for export to the grid of the energy produced by the renewable energy facilities.
- Failure to realise the potential local economic development and social upliftment benefits associated with the implementation of the project.

d) Conclusion

The 'no-go' alternative is the continuation of the existing land use, i.e., maintain the status quo. As detailed in the sections above, there would be no environmental impacts on the site or to the surrounding local area due to the construction and operation activities of substations and associated power lines with the implementation of this alternative. All negative impacts, specifically related to the development of the Poortjie Wes Cluster Grid, discussed in this report will not materialise.

The 'do-nothing' alternative will do little to influence the renewable energy targets set by government due to competition in the sector, and the number of renewable energy projects being bid to the DMRE, as the supportive function of grid connection represented by this project would nullify the development of the six renewable energy facilities (and potentially other renewable facilities planned in the Beaufort West REDZ in future). As the area has an ample solar resource, not developing the Poortjie Wes Cluster Grid (and the renewable energy facilities they will cater for) would see such an opportunity being lost. As current land use activities can continue on the study area once the project is operational, the loss of the land to this project during the operation phase is not considered significant. In addition, the Western Province will not benefit from additional generated power being evacuated directly into the province's grid. Therefore, the 'do-nothing' alternative is not preferred as there is a perceived loss of benefits for the regional area.

From the specialist studies undertaken, no environmental fatal flaws were identified to be associated with the Poortjie Wes Cluster Grid. All impacts associated with the project can be mitigated to acceptable levels. If the project is not developed, the following positive impacts will not be realised:

- Job creation and skills development from the construction and operational phases.
- Economic benefit to participating landowners due to the revenue that will be gained from leasing the land to the developer.
- Meeting of the energy generation mix in a most economic and rapid manner.
- Support of the provision of clean, renewable energy in an area where the energy resource is optimally available.

As detailed above, the 'do-nothing' alternative will result in a number of lost opportunities. The 'do nothing' alternative is, therefore, not preferred and not proposed to be implemented for the development of the Poortjie Wes Cluster Grid.

CHAPTER 8: ASSESSMENT OF POTENTIAL CUMULATIVE IMPACTS

The Poortjie Wes Cluster Grid lines may have effects (positive and negative) on natural resources, the social environment and on the people living in the project area. Chapter 7 has reported on the assessment of impacts associated with the proposed project largely in isolation (from other similar developments).

This Chapter assesses the potential for the impacts associated with the project to become more significant when considered in combination with other known or proposed electrical grid infrastructure within the area.

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 the EIA Regulations, 2014 - 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 Poortjie Wes Cluster Grid are included and assessed within this chapter.

The assessment of potential cumulative impacts is based on information currently available and considers impacts from similar developments within the area. **Figure 8.1** indicates the location of the Poortjie Wes Cluster Grid in relation to all other known and viable (i.e., projects with a valid Environmental Authorisation) transmission infrastructure projects located within a radius of 30km from the development area under assessment. These include existing grid connection infrastructure in the area, as well as other proposed and existing renewable energy developments, each of which have associated grid connections. These renewable projects were identified using the DFFE Renewable Energy Database and current knowledge of projects being proposed and developed in the area.

Table 8.2: Solar facilities located within the surrounding area (within a 50km radius) of the Poortjie Wes Cluster Grid

Project Name	DFFE Ref. No	Location	Project Status
75MW Beaufort West Photovoltaic (PV) Project	14/12/16/3/3/1/2332	46km southwest	Authorised
Belvedere Solar Energy facility	TBA	To be confirmed	In Process
Brakpan 2 Solar Energy facility	TBA	To be confirmed	In Process
Montana 1 Solar Energy facility	TBA	27km west	In Process
Montana 2 Solar Energy facility	TBA	12km northwest	In Process
Montana 3 Solar Energy facility	TBA	11km west	In Process

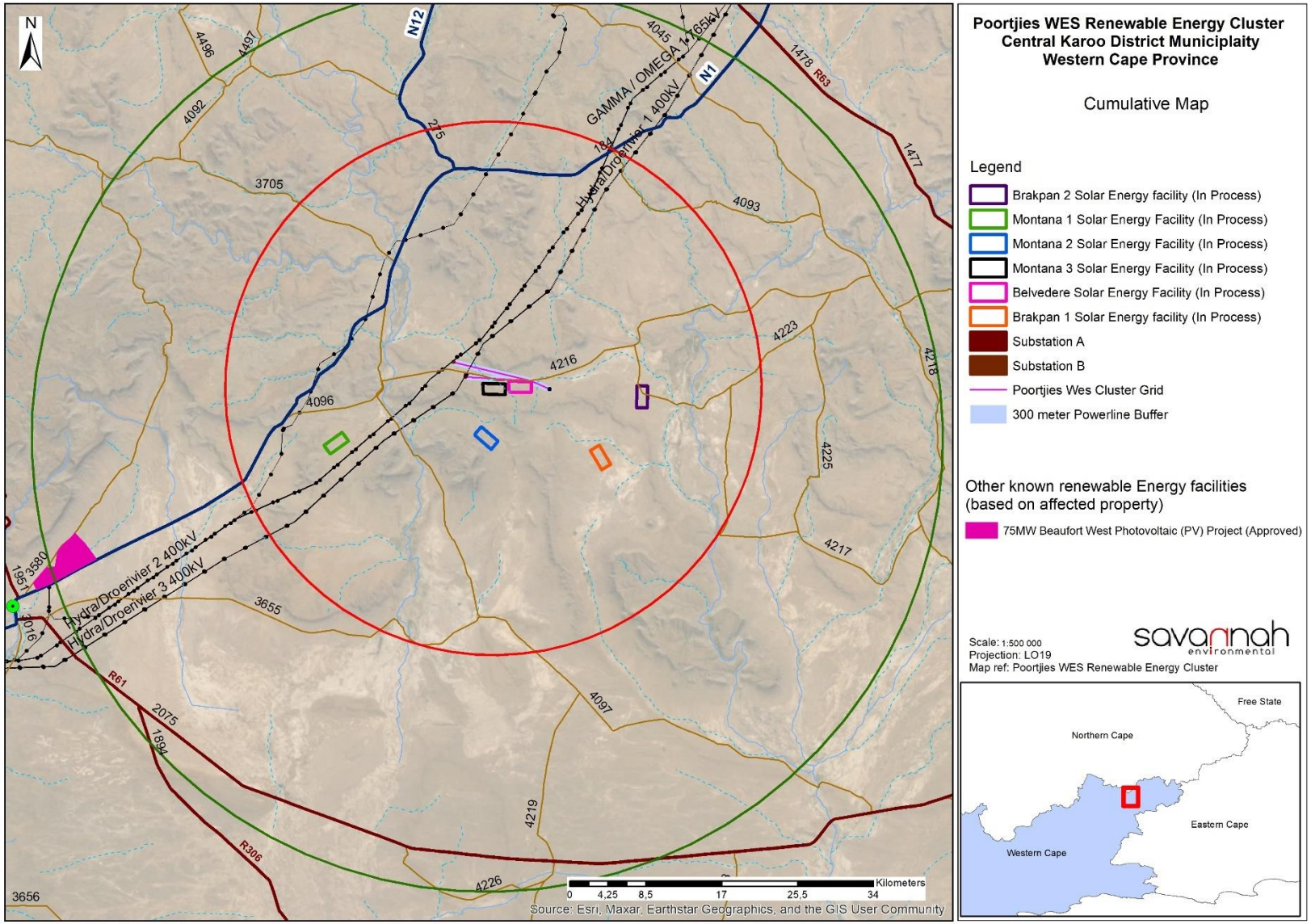


Figure 8.1: Location of the project site in relation to existing, authorised, and proposed renewable energy facilities and grid connection infrastructure

The following potential impacts are considered:

- Cumulative impacts on terrestrial ecology (flora and fauna)
- Cumulative impacts on avifauna
- Cumulative impacts on land use, soils, and agricultural potential
- Cumulative impacts on heritage resources (including palaeontology)
- Cumulative visual impacts
- Cumulative socio-economic impacts

This assessment considers whether the cumulative impact will result in:

- Unacceptable loss of habitat or landscape connectivity through clearing, resulting in an impact on the conservation status of such flora, fauna, or ecological functioning.
- Unacceptable risk to avifauna through loss of avifaunal habitats and collision risks.
- Unacceptable loss of agricultural potential areas presenting a risk to current land use activities and increased soil erosion.
- Unacceptable loss of heritage resources (including palaeontological and archaeological resources).
- Complete or whole-scale change in the cultural landscape, sense of place and character of an area and unacceptable visual intrusion.
- Unacceptable impact on traffic.
- Unacceptable impact to social factors and components.

8.2. Cumulative Impact on Ecology (Flora and Fauna)

This section describes the cumulative potential impacts of the project on biodiversity. Cumulative impacts are assessed in context of the extent of the proposed development area, other developments in the area, as well as general habitat loss and transformation resulting from other activities in the area.

Presently, the surrounding immediate and broader landscape consists of natural vegetation used for supporting livestock and to a lesser extent game. The Phase 1 and Phase 2 REDZs spatial files and the South African Renewable Energy EIA Application Database (DFFE, 2021) was overlaid onto the Gamka Karoo and Upper Karoo Hardevelremnants layer. The remnants layer was released as part of the NBA (Skowno *et al*, 2019) and provides the present spatial extent of vegetation. The South African Renewable Energy EIA Application Database contains spatial data for renewable energy applications for environmental authorisation. It includes spatial and attribute information for both active (in process and with valid authorisations) and non-active (lapsed or replaced by amendments) applications. Data is captured and managed on a parcels level as well as aggregated to the project level at the boundary level. Considering the limited extent of approved and in process developments within the Gamka Karoo and (Figure 8.2), the expected cumulative impact is expected to be of a 'Medium' significance.

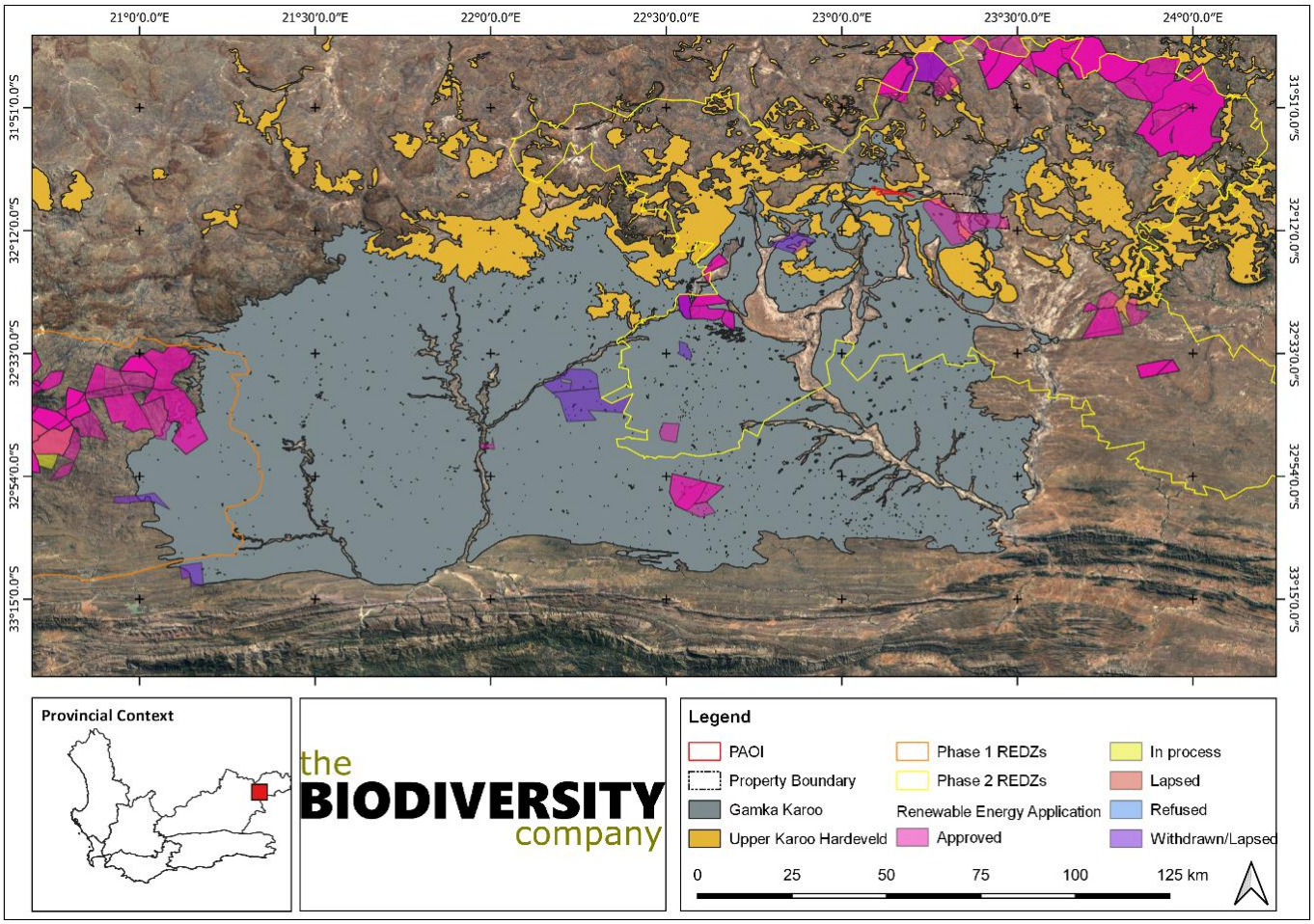


Figure 8.2: Map illustrating additional renewable energy developments within the Gamka Karoo and Upper Karoo Hardeveld vegetation types

Impact Nature: Cumulative habitat loss within the region		
The development of the proposed Poortjie Wes Grid Connection Infrastructure will contribute to cumulative habitat loss within the Gamka Karoo, Upper Karoo Hardeveld and Ecological Support Areas		
	Overall impact of the proposed development considered in isolation	**Cumulative impact of the project and other projects in the area**
Extent	Very low (1)	Low (2)
Duration	Long term (4)	Long term (4)
Magnitude	Minor (2)	Low (4)
Probability	Highly Probable (4)	Highly Probable (4)
Significance	**Low (28)**	**Medium (40)**
Status	Negative	Negative
Reversibility	High	High
Irreplaceable loss of resources	No	Yes, in certain cases
Can impacts be mitigated	Yes, to some degree. However, should the entirety of the REDZ areas be developed, the cumulative impacts on the receiving environment will be regarded as 'High.'	
Mitigation: Ensure that a rehabilitation plan and IAP management plan be compiled for each development and are effectively implemented. Set-aside areas (Avoidance areas) should be established in order to conserve natural habitats where possible.		

8.3. Cumulative Impact on Avifauna

The cumulative impact assessment includes the position and number of existing transmission infrastructure and impacts present across the receiving environment considering the scenario where all the renewable energy components proposed in the cluster are approved and constructed following appropriate mitigation measures.

For solar energy developments and associated grid connection the highest potential cumulative impacts following the implementation of mitigation measures relate to the direct destruction of habitat (primarily during the construction phase). The potential reduction in habitat availability for a Martial Eagle pair that may utilise a nest located on the adjacent overhead power line would not likely have a significant negative impact on their breeding success or productivity as the species tends to prefer thicker vegetation associated with the watercourses and irregular terrain as they are likely higher productivity foraging areas and these areas are largely avoided by the proposed developments which are focussed on flatter, more open areas away from drainage lines.

The position of the proposed infrastructure in close proximity to existing transmission lines reduces the length of grid connection required and is therefore unlikely to increase the risk associated with overhead power lines in the area beyond that already present across the landscape.

Nature: Cumulative impact of existing and proposed developments in the broader area could potentially increase the significance above that determined for each component separately and impart a combined impact on the avifaunal community of the receiving environment. E.g. direct and indirect habitat loss could cumulatively result in an unsustainable size of a bird's territory being made unavailable for breeding and foraging purposes.		
	Overall impact of the proposed project considered in isolation	**Cumulative impact of the project and other projects in the area**
Extent	Low (1)	Low (1)
Duration	Long-term (4)	Long-term (4)
Magnitude	Minor (1)	Minor (1)
Probability	Definite (5)	Definite (5)
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	Yes
Confidence in findings: High.		
Mitigation: Mitigation as listed in the avifaunal impact assessment for the project (and those relevant to other proposed projects) must be implemented.		

8.4. Cumulative Impact on Heritage Resources

At this stage, there is the potential for the cumulative impact of proposed renewable energy facilities to negatively impact the cultural landscape due to a change in the landscape character from natural wilderness to semi-industrial. The placement of grid connection infrastructure must take cognisance of the very high visual impact on a relatively intact and representative cultural landscape, and the extremely

limited ability to visually screen this infrastructural development. For this particular project, the findings of the VIA are that "Overall, the post mitigation significance of the visual impacts is predominately moderate to low. A high significance rating is anticipated for users travelling along the secondary roads and residents of dwellings within 0.5 km from the proposed infrastructure. However, due to the low number/ density of homesteads/dwellings within the study area and the fact that observers travelling along the secondary road will only experience a visual intrusion for a short period of time, this impact is anticipated to be greatly reduced."

Nature: Cumulative Impact to the sense of place				
		Overall impact of the proposed project considered in isolation		**Cumulative impact of the project and other projects in the area**
Magnitude	**L (4)**	Low	**L (4)**	Low
Duration	**M (3)**	Medium-term	**H (4)**	Long-term
Extent	**L (1)**	Low	**L (1)**	Low
Probability	**L (2)**	Improbable	**H (3)**	Probable
Significance	**L**	**(4+3+1)x2=16**	**L**	**(4+4+1)x3=27**
Status		Neutral		Neutral
Reversibility	**H**	High	**L**	Low
Irreplaceable Loss Of Resources?	**L**	Unlikely	**L**	Unlikely
Can Impacts Be Mitigated		NA		NA
Confidence In Findings: High				
Mitigation: No impacts are anticipated and as such, no mitigation is required				

8.5. Cumulative Visual Impact

There are already existing high voltage power lines that traverse the study area, namely the Droerivier/Hydra 2 400 kV and Gamma/Kappa 1 765 kV and the Droerivier/Hyrda 1&3 400 kV overhead lines. The addition of the proposed Poortjie Wes Cluster Grid Connection will result in an increase in this type of infrastructure within the region and could result in a cumulative visual impact.

The table below illustrates the assessment of the anticipated cumulative visual impact of infrastructure on sensitive visual receptors within the region. Visual impacts are likely to be of **moderate** significance with no mitigation possible.

Nature of Impact: Potential cumulative visual impact of infrastructure on visual receptors within the region		
	Overall impact of the project considered in isolation (with mitigation)	**Cumulative impact of the project and other projects within the area (with mitigation)**
Extent	Low **(2)**	Medium to longer distance (2)
Duration	Long **(4)**	Long **(4)**
Magnitude	Moderate **(6)**	High **(8)**
Probability	Probable **(3)**	Probable **(3)**
Significance	**Moderate (36)**	**Moderate (42)**
Status (positive or negative)	Negative	Negative

Reversibility	Recoverable **(3)**	Recoverable **(3)**
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	Yes	

Mitigation / Management:

Planning:

» Respond to the natural environment during the planning of buildings and infrastructure.
» Consolidate development and make use of already disturbed sites rather than pristine areas.
» Retain vegetation in all areas outside of actual built footprints wherever possible.
» Visually break up large bulky buildings into smaller, subtler, less prominent shapes and planes.
» Retain / re-establish and maintain natural vegetation in all areas outside of the development footprint.
» Plan ancillary infrastructure in such a way and in such a location that clearing of vegetation is minimised.
» Use existing roads wherever possible. Where new roads are required to be constructed, these should be planned carefully, taking due cognisance of the local topography. Roads should be laid out along the contour wherever possible and should never traverse slopes at 90 degrees. Construction of roads should be undertaken properly, with adequate drainage structures in place to forego potential erosion problems.
» Wherever possible, use materials, coatings, or paints that have little or no reflectivity.
» Commercial messages, symbols and/logos are not permitted on structures.
» Use slight variations in topography to screen PV panels, where possible. Design linear features to follow natural land contours rather than straight lines.

Construction:

» Rehabilitate all construction areas.
» Ensure that vegetation is not cleared unnecessarily to make way for infrastructure.

Operations:

» Maintain the general appearance of the facility as a whole.
» Monitor rehabilitated areas and implement remedial action as and when required.

Decommissioning:

» Remove infrastructure not required for the post-decommissioning use of the site.
» Rehabilitate all areas. Consult an ecologist regarding rehabilitation specifications.
» Monitor rehabilitated areas post-decommissioning and implement remedial actions.

Residual impacts:

The visual impact will be removed after decommissioning, provided the facility and ancillary infrastructure is removed. Failing this, the visual impact will remain.

8.6. Cumulative Impacts on Traffic

To assess the cumulative impact, it was assumed that all proposed and authorized renewable energy projects within 30 km be constructed at the same time. This is a precautionary approach, as in reality these projects would be subject to a highly competitive bidding process. Only a handful of projects would be selected to enter into a power purchase agreement with Eskom, and construction is likely to be staggered depending on project-specific issues.

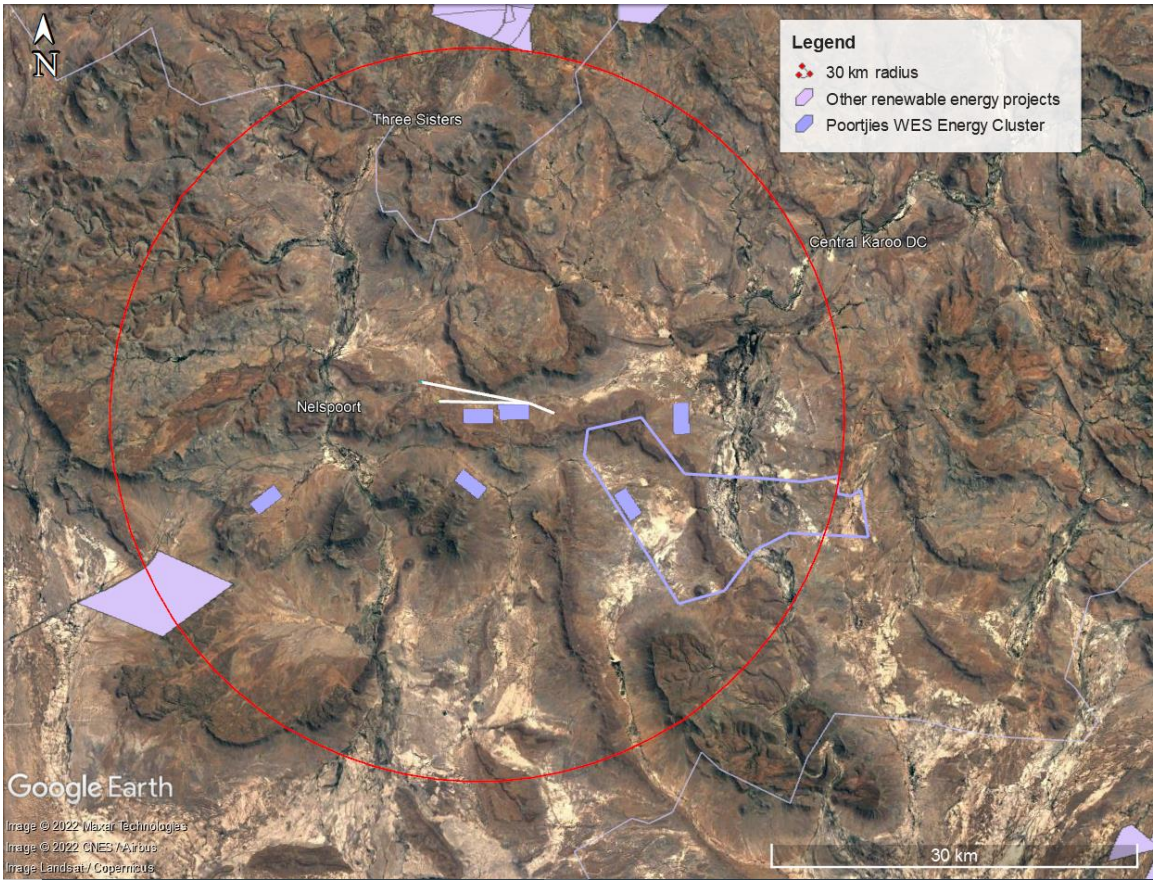


Figure 8.3: Other renewable energy projects within a 30km radius from site

According to the Department of Forestry, Fisheries and Environment's database there is one (1) other authorised renewable energy facility within a 30km radius of the proposed study area, as indicated in Figure 8.3 above.

It is however unclear whether other projects not related to renewable energy is or has been constructed in this area, and whether other projects are proposed. In general, development activity in the area is focused on agriculture. It is quite possible that future renewable energy development may take place within the general area.

The construction and decommissioning phases are the only significant traffic generators for renewable energy projects and their associated grid connection infrastructure. The duration of these phases is short term (i.e. the impact of the generated traffic on the surrounding road network is temporary and renewable energy facilities, when operational, do not add any significant traffic to the road network).

Even if all renewable energy projects within the area are constructed at the same time, the roads authority will consider all applications for abnormal loads and work with all project companies to ensure that loads on the public roads are staggered and staged to ensure that the impact will be acceptable.

Nature: Traffic generated by the proposed development and the associated noise and dust pollution.		
	Overall impact of the proposed project considered in isolation (post mitigation)	**Cumulative impact of the project and other projects in the area**
Extent	Low (2)	High (5)

Duration	Short (1)	Medium-term (3)
Magnitude	Minor (2)	High (8)
Probability	Probable (3)	Improbable (2)
Significance	**Low (15)**	**Medium (32)**
Status (positive/negative)	Negative	Negative
Reversibility	High	High
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	Yes	Yes

Mitigation:

» Stagger component delivery to site.
» Dust suppression.
» Reduce the construction period.
» The use of mobile batching plants and quarries near the site would decrease the impact on the surrounding road network by reducing the construction trips and the distance travelled to transport the materials to the site.
» Staff and general trips should occur outside of peak traffic periods.

Residual Impacts:

» Minimal increase in traffic during the operational phase on local roads.
» Decrease in air quality due to dust generation during construction phase only.
» Increase in noise levels only during the construction phase.

8.7. Cumulative Socio-Economic Impact

The VIA notes that there are already existing high voltage power lines that traverse the study area, namely the Droerivier/Hydra 2 400 kV and Gamma/Kappa 1 765 kV and the Droerivier/Hyrda 1&3 400 kV overhead lines. The addition of the proposed Poortjie Wes Cluster Grid Connection will therefore result in an increase in this type of infrastructure within the region and could result in a cumulative visual impact. However, the site is located within the Beaufort West REDZ. The area has therefore been identified as suitable for the establishing of large-scale renewable energy facilities and associated grid infrastructure.

Nature: Visual impacts associated with the establishment of more than one transmission line and the potential impact on the area's rural sense of place and character of the landscape.

	Overall impact of the proposed project considered in isolation	**Cumulative impact of the project and other projects in the area**
Extent	Local (1)	Local and regional (2)
Duration	Long term (4)	Long term (4)
Magnitude	Low (4)	Low (4)
Probability	Probable (3)	Probable (3)
Significance	**Low (27)**	**Medium (30)**
Status (positive/negative)	Negative	Negative
Reversibility	Yes. Grid infrastructure can be removed.	
Loss of resources?	No	No
Can impacts be mitigated?	Yes	

Confidence in findings: High.

Mitigation:
The recommendations of the VIA should be implemented.

8.8. Conclusions regarding Cumulative Impacts

Cumulative impacts and benefits on various environmental and social receptors will occur to varying degrees with the development of infrastructure for the transmission and distribution of electricity, as well as renewable energy facilities in South Africa. The most significant of these will be the contribution towards a reduction in greenhouse gas emissions and consequent assistance with climate change mitigation.

The alignment of renewable energy developments, including their associated grid connection infrastructure, with the IRP and the global drive to move away from the use of non-renewable energy resources and to reduce greenhouse gas emissions is undoubtedly positive. The social and economic benefits of renewable energy developments at a local, regional, and national level have the potential to be significant. However, there is a lack of understanding of the cumulative impacts on other environmental and social receptors such as birds, visual amenity, and landscape character of the affected areas largely due to limited information of impacts from existing facilities within the country. This assessment is therefore qualitative.

The assessment of the cumulative impacts was undertaken through consideration of the impacts associated with the Poortjie Wes Cluster Grid in isolation, compared to the cumulative impacts of the Poortjie Wes Cluster Grid in combination with existing, authorised, and proposed renewable energy facilities and grid connection infrastructure within a 30km radius of the development area. Cumulative impacts are expected to occur with the development of the Poortjie Wes Cluster Grid 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 Poortjie Wes Cluster Grid 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 Poortjie Wes Cluster Grid from low to medium. A summary of the cumulative impacts is included in the following table.

Specialist assessment	**Overall significance of impact of the proposed project considered in isolation (negative unless indicated otherwise) (with mitigation)**	**Cumulative significance of impact of the project and other projects in the area (negative unless indicated otherwise) (with mitigation)**
Ecology	Low	Medium
Avifauna	Medium	Medium
Heritage resources relating to the cultural landscape	Low	Low
Visual	Medium	Medium
Socio-economic	Low	Medium

Considering the findings of the specialist assessments undertaken for the project, the cumulative impacts for the proposed Poortjie Wes Cluster Grid will be acceptable, with the majority of the negative impacts being rated as being of low to medium significance, and the positive impacts as medium to high significance with the implementation of appropriate mitigation. On this basis, the following can be concluded considering the Poortjie Wes Cluster Grid:

» There are no impacts associated with the establishment of the Poortjie Wes Cluster Grid that cannot be mitigated to a medium or low significance. Overall, cumulative impacts associated with the Poortjie Wes Cluster Grid development are considered acceptable.

- From an ecology perspective, the contribution of the Poortjie Wes Cluster Grid lines to cumulative impact in the area would be low and is considered acceptable.
- The overall avifaunal cumulative impact of the planned Poortjie Wes Cluster Grid, when considered in isolation, is considered to be Medium.
- Considering the development of other renewable energy facilities and grid connection infrastructure located next to the Poortjie Wes Cluster Grid and within the broader region, the cumulative unmitigated impacts on Historical structures, Burial ground and graves as well as palaeontological resources consist of a medium negative impact mostly confined to the construction phase of the projects. This could potentially result in an unacceptable loss of heritage resources. However, by implementing the proposed mitigation measures, the cumulative impacts can be managed to low negative.
- The combined visual impact or cumulative visual impact of the Poortjie Wes Cluster Grid, existing transmission infrastructure and other renewable energy facilities planned in the area is expected to increase the area of potential visual impact within the region. However, the location of these renewable energy facilities within the Beaufort West REDZ and the Central Strategic Transmission Corridor will contribute to the consolidation of infrastructure to this locality and avoid a potentially scattered proliferation of renewable energy generation infrastructure throughout the region. The anticipated cumulative visual impact of the proposed Poortjie Wes Cluster Grid is expected to be of Moderate significance, which is considered to be acceptable from a visual perspective.
- The project will not significantly increase the negative impact on the social environment. However, an increase in positive impacts, specifically as a result of job creation and socio-economic benefits, can be expected. The cumulative impact is expected to be moderate.

Based on a detailed evaluation, the cumulative impacts associated with the construction and operation of the proposed Poortjie Wes Cluster Grid and other proposed renewable energy facilities, including their associated grid connection infrastructure in the region are considered to be acceptable. The generally low potential for cumulative impacts and specialist mitigation measures provided makes the location of this project within the Beaufort West REDZ and the Central Strategic Transmission Corridor a desirable location for further consideration provided that environmental impacts are mitigated to suitable standards as recommended within this BA Report.

CHAPTER 9: CONCLUSIONS AND RECOMMENDATIONS

Poortjie Wes Cluster Grid (Pty) Ltd is proposing the development of grid connection infrastructure on a site located approximately 15km north-west of Nelspoort and 60km south-west of Beaufort West within the Beaufort West Local Municipality and the Central Karoo District in Western Cape Province (**Figure 1.1**). The development of the grid connection infrastructure is required to enable the connection of the Poortjie Wes Cluster of Renewable Energy Facilities, which comprises six (6) Solar PV Energy Facilities, to the national grid for the evacuation of the generated electricity. The entire extent of the site proposed for the grid connection infrastructure falls within the Central Corridor of the Strategic Transmission Corridors[17]. The grid connection infrastructure is known as the Poortjie Wes Cluster Grid.

The projects which the proposed grid connection infrastructure will facilitate connection for are known as:

- Belvedere Solar Energy facility;
- Brakpan 1 Solar Energy facility;
- Brakpan 2 Solar Energy facility;
- Montana 1 Solar Energy facility;
- Montana 2 Solar Energy facility; and
- Montana 3 Solar Energy facility.

The above listed renewable energy facilities are located within the Beaufort West REDZ (REDZ 11), as well as within the Central Strategic Transmission Corridor. Each project proposed as part of this cluster is the subject of a separate EIA application process.

Each of the six renewable energy facilities listed above will be connected to the proposed 132kV Belvedere Collector Switching Station (the "Collector Switching Station") via 132kV Overhead Lines ("OHLs"). The individual project 132kV power lines are assessed as part of separate Basic Assessment processes. The scope of this Basic Assessment (BA) Report is solely focused on the following infrastructure:

- A 132kV Belvedere Collector Switching Station (the "Collector Switching Station") and 132kV Overhead Lines ("OHLs") from each solar facility. The Collector Switching Station will have a footprint of ~16ha in extent and will be located on the Farm Belvedere Nr. 73, in the Beaufort West Local Municipality, Division of Murraysburg, Western Cape Province.
- The proposed Collector Switching Station will connect to the new Poortjie Wes 400/132kV LILO MTS ("Poortjie Wes LILO MTS") via a 132kV OHL (approximately 7km in length). Depending of which of the 400kV line is approved by Eskom, the OHL will cross the 400kV Droërivier/Hydra OHL. A corridor of 300m is being considered in this BA process, within which the 32m servitude for this power line will be located.
- A Poortjie Wes LILO MTS, which will have a footprint of ~16ha in extent. Two alternatives[18] are being considered and will be located on Portion 1 of the Farm Montana 73, in the Beaufort West Local Municipality, Division of Murraysburg, Western Cape Province.

[17] The Strategic Transmission Corridors are identified by the Department of Forestry, Fisheries, and the Environment (DFFE)) as geographical areas of strategic importance for the development of the supporting large scale electricity transmission and distribution infrastructure in terms of Strategic Integrated Project 10: Electricity Transmission and distribution. This is as per GNR113 of February 2018 and GNR383 of April 2021.

[18] The alternative to be implemented will be informed by environmental sensitivities and will be determined in consultation with Eskom.

» The MTS will connect to either of the existing 400kV Droërivier/Hydra OHL) traversing the property via a Loop-in Loop-out ("LILO") connection, depending on the MTS site selected. The 2 x 400kV LILO OHLs will be ~1km in length. A corridor of 500m is being considered in the BA process, within which the two 55m servitudes for these power lines will be located.

A summary of the recommendations and conclusions for the proposed project is provided in this Chapter.

9.1. 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 Basic Assessment 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 supporting infrastructure establishment has been included in **section 9.2**.
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 has been included as **section 9.5**. Sensitive environmental features located within the project site, overlain with the proposed development area for the Poortjie Wes Cluster Grid have been identified and are shown in Figure 9.1. A summary of the positive and negative impacts associated with the 400kV MTS and power lines has been included in **section 9.4**.
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 **sections 9.5 and 9.6**.
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 Poortjie Wes Cluster Grid have been included in **section 9.6.**
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 Poortjie Wes Cluster Grid should be authorised has been included in **section 9.6**.

9.2. Evaluation of the Poortjie Wes Cluster Grid

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 Poortjie Wes Cluster Grid. This chapter concludes the environmental assessment of the project 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 project.

No environmental fatal flaws or unacceptable impacts were identified in the detailed specialist studies conducted, provided that the recommended mitigation measures are implemented. Impacts identified to be associated with the proposed project and assessed within this report include:

» Impacts on terrestrial ecology (including flora, fauna and water resources).
» Impacts on avifauna.
» Impacts on heritage resources, including archaeology and palaeontology.
» Impacts on land use, soils and agricultural potential.
» Impacts on Traffic
» Visual impacts.
» Impacts on the socio-economic environment.

9.2.1 Impacts on Ecology (including Flora and Fauna)

The aim of this Biodiversity Impact Assessment was to provide information to guide the risk of the proposed Poortjie Wes Grid Connection Infrastructure to the ecosystems affected by its development and their inherent fauna and flora. Based on the latest available ecologically relevant spatial data the following information is pertinent to the project area:

» It is recognised as an Ecological Support Area and an Other Natural Area as per the Western Cape Biodiversity Spatial Plan;
» The Combined Animal Species Theme Sensitivity was rated as 'Medium' to 'High' according the Environmental Screening Tool; and
» The Ecosystem Protection Level for the vegetation types associated with the development footprint is regarded as Poorly Protected.

Based on the fauna components recorded within the PAOI and proximal landscape, the area provides important ecosystem services, particularly with regards to the maintenance of dynamic soil properties and nutrient cycling. The SEI of the PAOI was determined to 'High' based on the high likelihood of occurrence for NT species, the extent of the area considered and its connectivity to natural areas within the landscape, and the low resilience of the vegetation type.

The main expected impacts of the proposed development will be the loss of habitat and emigration of fauna. Based on the outcomes of the SEI determination, the project possesses a 'High' SEI. This denotes that avoidance mitigation wherever possible must be implemented. This includes changes to project infrastructure design to limit the amount of habitat impacted. Moreover, the avoidance and minimisation mitigation measures are the most important with respect to the mitigation hierarchy. Therefore, the infrastructure footprint must be minimised to reduce the risk of impacts to the receiving environment.

The project area is located within the Central Corridor of the Strategic Transmissions Corridors and taking into consideration that the grid infrastructure is necessary for the proposed solar energy developments and can be appropriately placed to minimise impacts on terrestrial ecology, it is the opinion of the specialist that the authorisation of the proposed project may be favourably considered. It is recommended that should any additional future developments be proposed for the remaining extent of any 'Very High' or 'High' SEI areas within the associated properties, that offset strategies be required for these authorisations.

The proposed grid connection is expected to pose a low residual risk to the delineated drainage lines, with key mitigation being the avoidance and adherence to the recommended buffer widths. Due to the low residual risk, a General Authorisation is required for the required water use authorisation.

No preference (Option A or Option B) was given to the preferred alternative in terms of ecological sensitivities.

9.2.2 Impacts on Avifauna

The proposed development site is well suited for the development of grid connection infrastructure such as that proposed. The available habitat across the site is already modified through grazing pressure and is located relatively close to existing overhead transmission lines, resulting in a reduced length of novel overhead powerline required for the grid connection, reducing the potential impact on species particularly susceptible to collisions with transmission lines such as bustards, cranes and storks in the area.

Martial Eagle are known to utilise multiple nesting structures within their territory, often alternating between multiple sites. This species can also forgo breeding attempts in years following a successful attempt. Therefore, a distinct possibility exists that Martial Eagle will not attempt to utilise the located nest structure during the construction phase due to factors unrelated to the proposed development. Should it become apparent that a breeding attempt is being made, however, impacts are relatively easy to mitigate through avoidance of the area during the appropriate periods (e.g. May to August/September).

The proposed development is unlikely to have a significant negative impact on the long-term viability or persistence of avifaunal species in the area and therefore can be approved from an avifaunal perspective. As such, no preference (Option A or Option B) was given to the preferred alternative in terms of avifaunal sensitivities.

9.2.3 Impacts on Heritage Resources

The site forms part of an intact cultural landscape representative of the Central Plateau of the Great Karoo possessing heritage value for historical, aesthetic, architectural, social and scientific reasons. The site possesses a number of landscape elements contributing to a composite cultural landscape including topographical features, open plains, water features, historic scenic routes and farmsteads. The area proposed for development is located within the Juriesfontein Murraysberg Landscape Character Area and in order to mitigate the anticipated negative impact to the historic access route, various recommendations are made.

No archaeological resources of significance were identified within the area proposed for development although the broader area has archaeological significance in terms of the sensitive dolerite outcrops in the broader area. No further mitigation is recommended.

No observations of palaeontological significance were noted within the area proposed for development. However, the geology underlying the development area remains sensitive for impacts to significant palaeontological heritage.

Based on the outcomes of the Heritage study, it is not anticipated that the proposed development of the grid connection infrastructure will negatively impact on significant heritage resources. The following recommendations are made:

- The recommendations of the VIA must be implemented.
- The Grid and other infrastructure should be concentrated to the south side of the road and should not follow both sides of the road simultaneously.
- TheGrid road crossings should be concentrated to the west side, in the broader valley area, consolidating with the existing grid road crossings
- The area proposed for development is located within the Juriesfontein Murraysberg Landscape Character Area and in order to mitigate the anticipated negative impact to the historic access route, a minimum buffer of 500m is recommended between the proposed Grid infrastructure (Option A and the associated 132kV powerline) and the road.
- The HWC Chance Fossil Finds Procedure must be implemented for the duration of construction activities
- Although all possible care has been taken to identify sites of cultural importance during the investigation of the study area, it is always possible that hidden or subsurface sites could be overlooked during the assessment. If any evidence of archaeological sites or remains (e.g. remnants of stone-made structures, indigenous ceramics, bones, stone artefacts, ostrich eggshell fragments, charcoal and ash concentrations), fossils, burials or other categories of heritage resources are found during the proposed development, work must cease in the vicinity of the find and HWC must be alerted immediately to determine an appropriate way forward.

There are limited impacts anticipated to archaeological and palaeontological heritage from this proposed development and as such, the principle of grid connection infrastructure in this location is supported from a heritage perspective as the infrastructure is located in an area able to tolerate this impact. Therefore no preference (Option A or Option B) was given to the preferred alternative in terms of heritage sensitivities.

9.2.4 Visual Impacts

The visual assessment of the proposed Poortjie Wes Cluster Grid Connection indicates that the construction and operation of the proposed infrastructure will have a visual effect on both the rural landscape and on sensitive receptors in the study area. The proposed infrastructure will be visible within an area that is generally characterised by low growing shrubland and wide-open undeveloped spaces. The infrastructure would thus be highly visible and impossible to hide within an area that incorporates potentially various sensitive visual receptors that may consider visual exposure to this type of infrastructure to be intrusive. The low occurrence of such sensitive visual receptors within this environment, specifically in close proximity to the proposed infrastructure as well as the presence of existing high voltage overhead power lines, is of relevance however, and has affected the significance rating of the anticipated visual impacts.

Overall, the post mitigation significance of the visual impacts is predominately **moderate** to **low.** A **high** significance rating is anticipated for users travelling along the secondary roads and residents of dwellings within 0.5 km from the proposed infrastructure. However, due to the low number/ density of homesteads/dwellings within the study area and the fact that observers travelling along the secondary road will only experience a visual intrusion for a short period of time, this impact is anticipated to be greatly reduced.

Notwithstanding the above, there are not many options as to the mitigation of the visual impact of the proposed infrastructure. No amount of vegetation screening or landscaping would be able to hide structures of these dimensions, especially within this receiving environment. General good practice measures have been recommended and should be implemented.

In order to ensure that all the spatial analyses and mapping undertaken in this report is as accurate as possible, a transparent and scientifically defensible approach in line with best practice methodology for this type of assessment, has been utilised. The objective of this process is to quantify the potential visual impacts associated with the proposed Poortjie Wes Cluster Grid Connection, using visibility analyses, proximity analyses and the identification of sensitive receptors. However, it must be noted that visual impact is a very subjective concept, personal to each individuals' backgrounds, opinions and perceptions. The subjects in this case are the identified sensitive receptors such as the residents of homesteads/dwellings and users of roads.

According to the Provincial Government of the Western Cape, Department of Environmental Affairs and Development Planning (DEA&DP) Guideline for Involving Visual and Aesthetic Specialists in the EIA Process (Oberholzer, 2005), the criteria that determine whether or not a visual impact constitutes a potential fatal flaw are categorised as follows:

4. Non-compliance with Acts, Ordinances, By-laws and adopted policies relating to visual pollution, scenic routes, special areas or proclaimed heritage sites.
5. Non-compliance with conditions of existing Records of Decision.
6. Impacts that may be evaluated to be of high significance and that are considered by the majority of the stakeholders and decision-makers to be unacceptable.

In terms of the above and to the knowledge of the author, the proposed development is compliant with all Acts, Ordinances, By-laws and adopted policies relating to visual pollution, scenic routes, special areas or proclaimed heritage sites, as well as, conditions of existing Records of Decisions and only one impact of high significance have been evaluated post mitigation though it is not deemed to be unacceptable.

This assessment has adopted a risk averse approach by assuming that the perception of most (if not all) of the sensitive visual receptors (bar the landowners of the properties earmarked for the development), would be predominantly negative towards the Poortjie Wes Cluster Grid Connection in the region. While still keeping in mind that there are also likely to be supporters of the facility (as a possible employer and income generator in the region) amongst the population of the larger region, but they are largely expected to be indifferent to the construction of the facility and not as vocal in their support for the facility as the detractors thereof.

Therefore, with the information available to the specialist at the time of writing this report, it cannot be empirically determined that the statistical majority of objecting stakeholders were exceeded. If evidence to the contrary surfaces during the progression of the development application, the specialist reserves the right to revise the statement below.

Therefore, the likelihood that the proposed development will be met with concern and objections from some of the affected sensitive receptors in the region, this report cannot categorically state that any of the above conditions were transgressed. As such these visual impacts are not considered to be fatal flaws for a development of this nature particularly due to the remote location of the study area and very low density

of visual receptors. It is, therefore, suggested that the proposed Poortjie Wes Cluster Grid Connection, as per the assessed layout be supported from a visual perspective, subject to the implementation of the suggested best practice mitigation measures provided in this report.

9.2.4 Traffic Impacts

The potential traffic and transport related impacts for the construction and operation phases for the proposed Poortjie Wes Cluster Grid Connection were assessed:

- The traffic generated during the construction phase, although significant, will be temporary and impacts are considered to be negative and of medium significance before and of low significance after mitigation.
- During operation, it is expected that maintenance and security staff will periodically visit the facility. Substations will be unmanned. The traffic generated during this phase will be minimal and will not have an impact on the surrounding road network.
- The traffic generated during the decommissioning phase will be slightly less than the construction phase traffic and the impact on the surrounding road network will also be considered negative and of medium significance before and of low significance after mitigation.

The potential mitigation measures mentioned in the construction phase are:
- Dust suppression
- Component delivery to/ removal from the site can be staggered and trips can be scheduled to occur outside of peak traffic periods.
- The use of mobile batching plants and quarries near the site would decrease the impact on the surrounding road network by reducing the construction trips and the distance travelled to transport the materials to the site.
- Staff and general trips should occur outside of peak traffic periods.
- A "dry run" of the preferred route.
- Design and maintenance of internal roads.
- If required, any low hanging overhead lines (lower than 5.1 m) e.g. Eskom and Telkom lines, along the proposed routes will have to be moved to accommodate the abnormal load vehicles.

The construction and decommissioning phases of a development are the only significant traffic generator and therefore noise and dust pollution will be higher during this phase. The duration of this phase is very short term i.e. the impact of the traffic on the surrounding road network is temporary and a grid connection facility, when operational, does not add any significant traffic to the road network.

Both the proposed access points and the access roads to the sites/facilities are deemed feasible from a traffic engineering perspective, however, vertical sight distances at the proposed access points should be verified on site.

The potential impacts associated with the proposed Poortjies Wes Cluster Grid Connection and associated infrastructure are acceptable from a transport perspective and it is therefore recommended that the proposed facility be authorised provided that the recommendations and mitigations contained in this report are adhered to. Therefore Option A and Option B are considered acceptable for the development of grid infrastructure.

9.2.6 Socio-Economic Impacts

The energy security benefits associated with the proposed Poortjie Wes PV SEF Cluster are dependent upon it being able to connect to the national grid via the establishment of grid connection infrastructure.

The findings of the SIA indicate that the significance of the potential negative social impacts for both the construction and operational phase of the proposed grid infrastructure are **Low Negative** with mitigation. The potential negative impacts can therefore be effectively mitigated if the recommended mitigation measures are implemented. The grid infrastructure is also located within the Beaufort West REDZ and Central Transmission Corridor. The establishment of proposed grid infrastructure for the Poortjie Wes PV SEF Cluster is therefore supported by the findings of the SIA.

The owner of Belvedere 73/1 indicated that Option A was the preferred transmission line alignment given that it is located along the Nelspoort-Murraysburg Road corridor. Option B located to the north of the road was not regarded as suitable as it would impact on a portion of the property that is used for seasonal commercial hunting. Potential impacts are related to sense of place/ visual, potential safety restrictions. This would compromise the best hunting area on the property also compromise the camp infrastructure that has been established for commercial hunting in the area. This is pertinent, as another portion of the property would be sterilized to hunting, should the proposed Montana PV 3 facility be constructed (Vivier, pers. comm). Therefore, option A transmission line alignment located parallel to the Nelspoort-Murraysburg Road is the preferred option.

9.2.7 Assessment of Cumulative Impacts

The proposed Poortjie Wes Cluster Grid cannot be considered in isolation. Cumulative impacts from other developments in the region need to be taken into consideration. Several other renewable energy facilities, with their associated infrastructure (such as the MTS and power lines) are proposed to be built in the region.

The proposed development is located within the Central Corridor of the Strategic Transmission Corridors, which has been identified by the DFFE as an area highly suitable for electrical grid infrastructure development, given a range of factors considered. Therefore, the DFFE envisages dealing with multiple applications for transmission infrastructure and cumulative issues within Strategic Transmission Corridors. The Strategic Transmission Corridors are of strategic importance for the rollout of supporting large scale electricity transmission and distribution infrastructure in terms of Strategic Integrated Project (SIP) 10: Electricity Transmission and Distribution. The transmission corridors are considered as areas where significant negative impacts on the environment are limited and socio-economic benefits to the country are enhanced.

The proposed development will contribute to the cumulative impact experienced within the area. The cumulative impacts associated with the Poortjie Wes Cluster Grid have been assessed to be acceptable, with no acceptable loss or risk expected.

Based on the specialist cumulative assessment and findings, the proposed development and its contribution to the overall impact of similar developments and renewable energy facilities to be developed within a 30km radius, will have a Low to Medium significance. It can be concluded that the proposed development will not result in unacceptable, high cumulative impacts and will not result in whole-scale large change of the environment (refer to **Table 9.1** and **Chapter 8**).

Table 9.1: Summary of cumulative impact significance for the Poortjie Wes Cluster Grid

Specialist assessment	Overall significance of impact of the proposed project considered in isolation (negative unless indicated otherwise) (with mitigation)	Cumulative significance of impact of the project and other projects in the area (negative unless indicated otherwise) (with mitigation)
Ecology	Low	Medium
Avifauna	Medium	Medium
Heritage resource (including palaeontology)	Low	Low
Visual	Medium	Medium
Socio-economic	Low	Medium

9.2.8 Comparison of Alternatives

The following layout alternatives were identified by the applicant for consideration in the BA process:

Project Component	Alternatives identified
Collector Substation	Only one feasible site has been identified for the location of the Collector Substation. This is located on the Farm Belvedere No.73. A larger development area in the form of a 300-meter buffer are being investigated around the substation in order to allow for the avoidance of any identified environmental sensitivities.
MTS	Two alternatives have been identified for the development of the 400kV MTS. The alternative to be implemented will be informed by environmental sensitivities and will be determined in consultation with Eskom, depending on which one of the two 400kV Droërivier/-Hydra OHL power lines are identified as the preferred connection point. A larger development area in the form of 500-meter buffers are being investigated around the substations (Option A and Option B) in order to allow for the avoidance of any identified environmental sensitivities.
400kV LILO power lines	Alternative locations for the LILO power lines from the MTS are linked to the location of the MTS. A 500m development corridor is considered for the two proposed loop-in loop-out 400kV power lines to connect the MTS to the electricity grid. A servitude of 60m per line will be appropriately placed within this corridor considering technical and environmental constraints.
132kV power line	Two alternative power line corridors between the Collector Substation and the alternative MTS sites have been identified for investigation in this BA process. Each corridor is 300m wide and approximately 7km long. The power line servitude of up to 40m will be appropriately placed within this corridor considering technical and environmental constraints.

The alternative to be implemented is to be informed by environmental sensitivities and will be determined in consultation with Eskom. From the outcomes of the specialist studies, the following has been concluded:

Specialist assessment	MTS Alternative A and associated 400kV LILO corridor and 132kV power line corridor from the Collector Substation	MTS Alternative B and associated 400kV LILO corridor and 132kV power line corridor from the Collector Substation
Ecology	No preference stated	No preference stated

Specialist assessment	MTS Alternative A and associated 400kV LILO corridor and 132kV power line corridor from the Collector Substation	MTS Alternative B and associated 400kV LILO corridor and 132kV power line corridor from the Collector Substation
Avifauna	No preference stated	No preference stated
Heritage resource (including palaeontology)	No preference stated (subject to mitigation guidelines stated in section 9.2.3)	No preference stated
Visual	No preference stated	No preference stated
Socio-economic	Preferred	Acceptable

In this regard, both alternatives are considered to be acceptable. Alternative A is preferred from a socio-economic perspective. The owner of Belvedere 73/1 indicated that Option A was the preferred transmission line alignment given that it is located along the Nelspoort-Murraysburg Road corridor. Option B located to the north of the road was not regarded as suitable as it would impact on a portion of the property that is used for seasonal commercial hunting. Potential impacts are related to sense of place/ visual, potential safety restrictions. This would compromise the best hunting area on the property also compromise the camp infrastructure that has been established for commercial hunting in the area. This is pertinent, as another portion of the property would be sterilized to hunting, should the proposed Montana PV 3 facility be constructed (Vivier, pers. comm). Overall, the majority of the specialist studies concluded that either alternative could be implemented, and the technically preferred option should be selected after consultation with Eskom with the exception of the preferred Option (Option A) stated by the socio-economic specialist (refer to section 9.2.6).

9.3. Environmental Sensitivity Mapping

As part of the specialist studies undertaken within the development envelope of the 400kV MTS, and 300 m power line corridor, specific sensitive environmental features and areas were identified (refer to **Figure 9.1**). The sensitive features identified specifically relate to terrestrial ecology, avifauna, and heritage resources, and are detailed below:

- ***Ecology:*** Based on the latest available ecologically relevant spatial data the following information is pertinent to the project area:
  - It is recognised as an Ecological Support Area and an Other Natural Area as per the Western Cape Biodiversity Spatial Plan;
  - The Combined Animal Species Theme Sensitivity was rated as 'Medium' to 'High' according the Environmental Screening Tool; and
  - The Ecosystem Protection Level for the vegetation types associated with the development footprint is regarded as Poorly Protected.

  Based on the fauna components recorded within the PAOI and proximal landscape, the area provides important ecosystem services, particularly with regards to the maintenance of dynamic soil properties and nutrient cycling. The SEI of the PAOI was determined to 'High' based on the high likelihood of occurrence for NT species, the extent of the area considered and its connectivity to natural areas within the landscape, and the low resilience of the vegetation type. This denotes that avoidance mitigation wherever possible must be implemented. This includes changes to project infrastructure design to limit the amount of habitat impacted.

- ***Avifauna:*** The Avifauna Specialist concluded that the site appears to be well suited for the development of grid connection infrastructure. The available habitat across the site is already modified through grazing pressure and is located relatively close to existing overhead transmission lines, resulting in a reduced length of novel overhead powerline required for the grid connection, reducing the potential impact on species particularly susceptible to collisions with transmission lines such as bustards, cranes and storks in the area. Martial Eagle are known to utilise multiple nesting structures within their territory, often alternating between multiple sites. This species can also forgo breeding attempts in years following a successful attempt. Therefore, a distinct possibility exists that Martial Eagle will not attempt to utilise the located nest structure during the construction phase due to factors unrelated to the proposed development. Should it become apparent that a breeding attempt is being made, however, impacts are relatively easy to mitigate through avoidance of the area during the appropriate periods (e.g. May to August/September).

- ***Heritage:*** There are limited impacts anticipated to archaeological and palaeontological heritage from this proposed development and as such, the principle of grid connection infrastructure in this location is supported from a heritage perspective as the infrastructure is located in an area able to tolerate this impact. The area proposed for development is located within the Juriesfontein Murraysberg Landscape Character Area and in order to mitigate the anticipated negative impact to the historic access route, a minimum buffer of 500m is recommended between the proposed Grid infrastructure (Option A and the associated 132kV powerline) and the road.

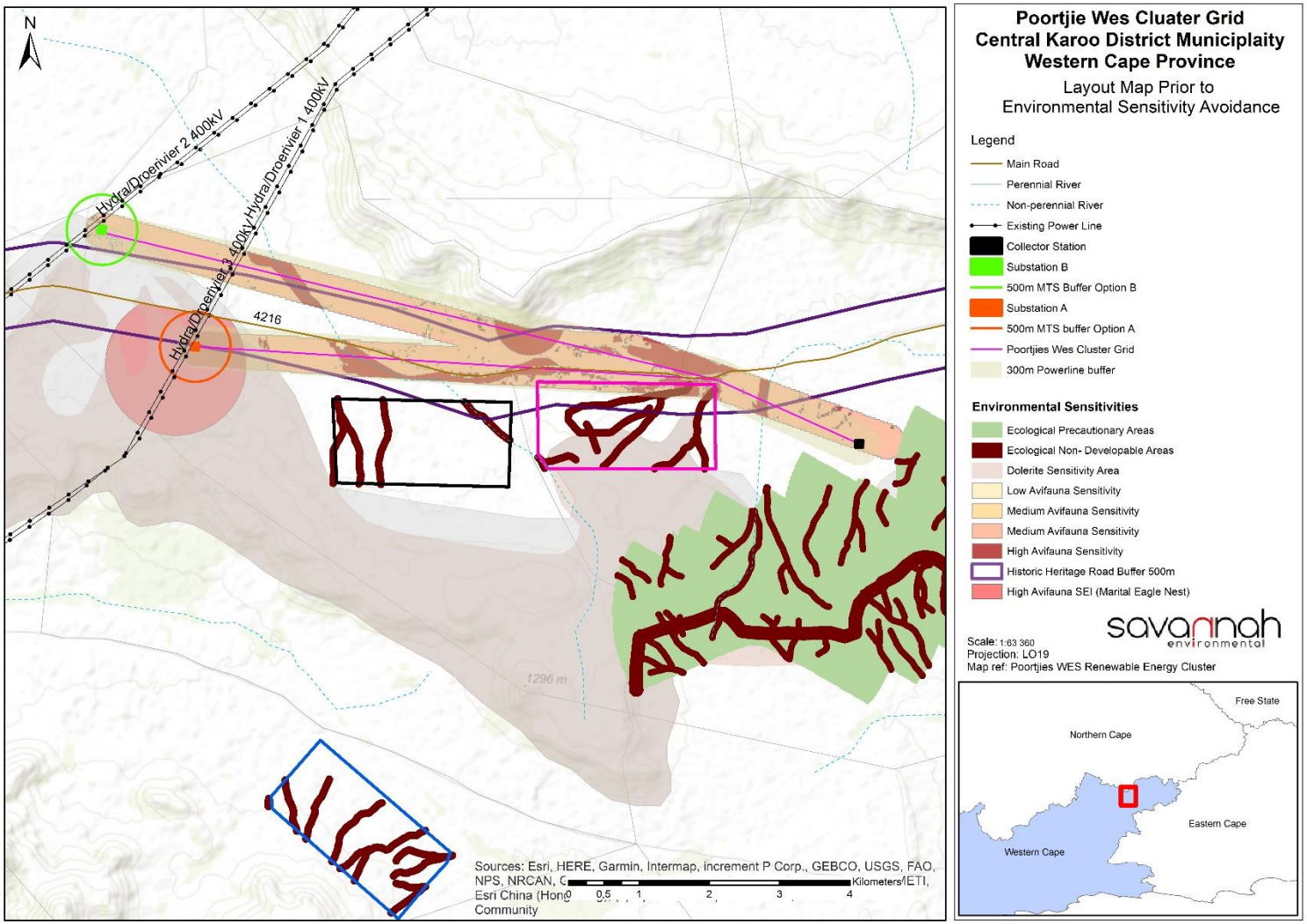


Figure 9.2: Overall Environmental Sensitivity Map for the Poortjie Wes Cluster Grid Study Area

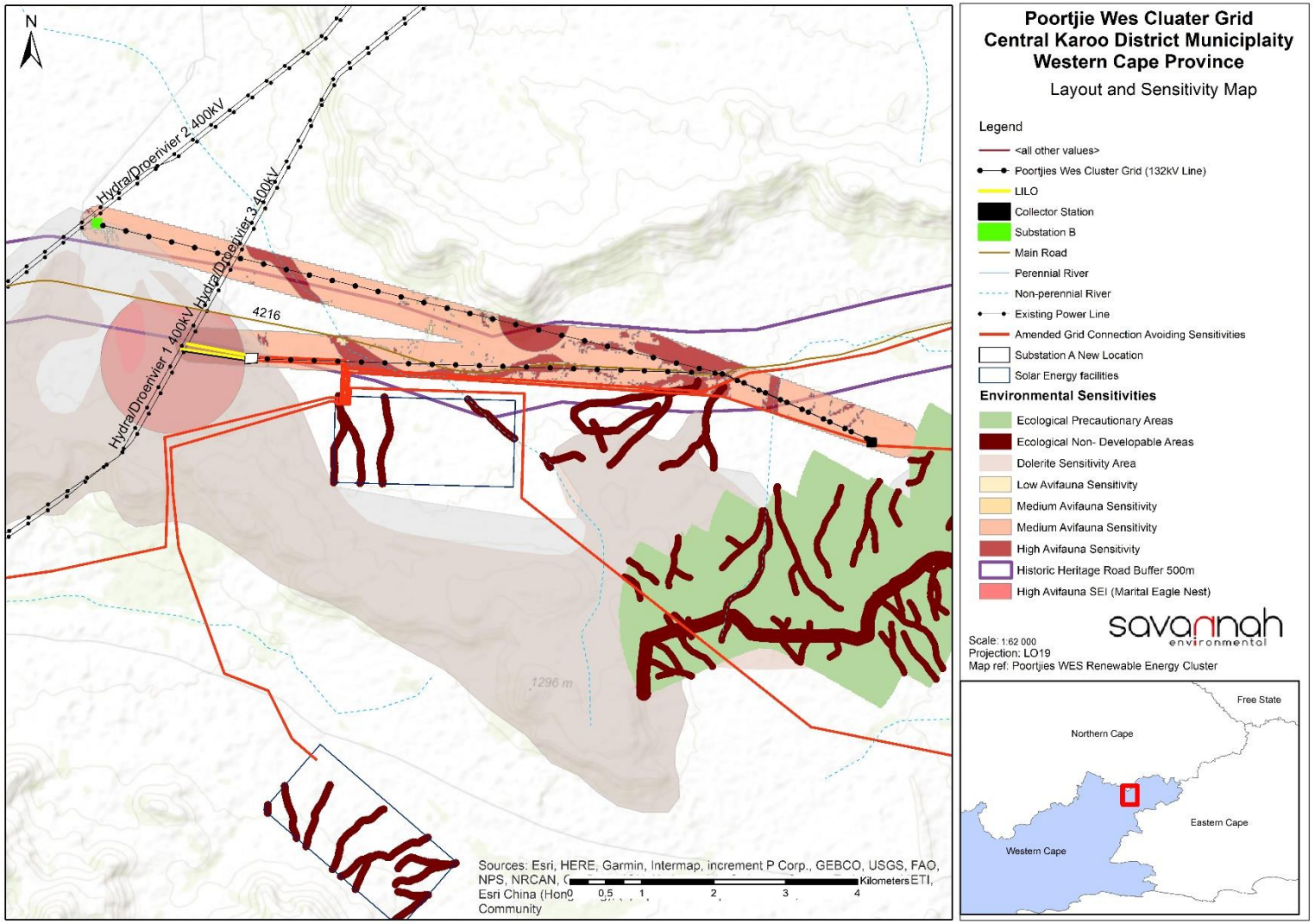


Figure 9.2: Final Layout map of the Poortjie Wes Cluster Grid avoiding environmental sensitivities (500m heritage road buffer)

9.4. Environmental Costs Versus Benefits of the Poortjie Wes Cluster Grid

9.5. Overall Conclusion (Impact Statement)

Independent specialists appointed to undertake the assessment of potential impacts associated with the project assessed a larger area in order to inform the best location for the infrastructure proposed as part of the Poortjie Wes Cluster Grid. The specialists considered desktop data, data collected from detailed field work, existing literature, and the National Web-based Environmental Screening Tool to inform the identification of sensitivities and assess potential impacts.

The specialist findings have indicated that there are no identified fatal flaws associated with the implementation of the proposed Poortjie Wes Cluster Grid within the project site. The location of the proposed infrastructure within the larger development footprint proposed for the substations and power line corridors will be undertaken considering the identified sensitive environmental features and areas present within the project site. This approach is in line with the application of the mitigation hierarchy, where all the sensitive areas which could be impacted by the development will be avoided as far as possible (i.e., tier 1 of the mitigation hierarchy). Where avoidance is not possible, recommended mitigation will be implemented. The minimisation of the significance of the impacts is in line with tier 2 of the mitigation hierarchy.

Therefore, it is concluded that impacts can be mitigated to acceptable levels or enhanced through the implementation of the recommended mitigation or enhancement measures. This is however not relevant for the visual impact of the infrastructure as the infrastructure proposed as part of the Poortjie Wes Cluster Grid will be visible regardless of the mitigation applied. However, this impact is not considered as a fatal flaw by the specialist.

As detailed in the cost-benefit analysis, the benefits of the Poortjie Wes Cluster Grid are expected to occur at a national, regional, and local level. As the costs to the environment at a site-specific level can be largely limited through the appropriate placement of infrastructure within lower sensitive areas, the benefits of the project are expected to partially offset the localised environmental costs of the proposed infrastructure. From an economic perspective, both positive and negative impacts are expected.

Based on the conclusions of the specialist studies undertaken, it can be concluded that the development of the Poortjie Wes Cluster Grid will not result in unacceptable environmental impacts, provided that the recommended avoidance and mitigation measures are implemented.

9.6. Overall Recommendation

Considering the findings of the independent specialist studies, the impacts identified, the development footprint proposed by the developer within the development area for the Poortjie Wes Cluster Grid, avoidance of sensitive environmental features within the project site, as well as the potential to further minimise the impacts to acceptable levels through mitigation, it is the reasoned opinion of the EAP that the proposed development of the Poortjie Wes Cluster Grid is acceptable within the landscape and can be reasonably authorised.

The following infrastructure would be included within an authorisation issued for the project:

» A 132kV Belvedere Collector Switching Station (the "Collector Switching Station") with a footprint of ~16ha in extent on the Farm Belvedere Nr. 73, in the Beaufort West Local Municipality, Division of Murraysburg, Western Cape Province.

- A 132kV OHL (approximately 7km in length) connecting the proposed Collector Switching Station to the new Poortjie Wes 400/132kV LILO MTS.
- A 400kV Poortjie Wes LILO MTS, which will have a footprint of ~16ha in extent, to be located on Portion 1 of the Farm Montana 73, in the Beaufort West Local Municipality, Division of Murraysburg, Western Cape Province.
- Loop-in Loop-out ("LILO") connection from the MTS to either of the existing 400kV Droërivier/Hydra OHL) traversing the property, depending on the requirements of Eskom.
- Temporary laydown areas.
- Staff accommodation (temporary).
- A temporary security building.
- A temporary concrete batching plant.
- Access roads/tracks.
- Lighting, fencing and buildings required for operation (i.e., ablutions required for maintenance staff).

The following key conditions would be required to be included within the environmental authorisation issued for the Poortjie Wes Cluster Grid:

- 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 EMPrs as contained within **Appendix K** and **L** of this BA Report should form part of the contract with the Contractor appointed to construct and the maintain the substation and power lines in order to ensure compliance with environmental specifications and management measures. The implementation of these EMPrs for all life cycle phases of the substation and power lines is considered key in achieving the appropriate environmental management standards as detailed for this project.
- Following the final design of the Poortjie Wes Cluster Grid, a final layout and power line route must be submitted to the DFFE for review and approval prior to commencing with construction activities. No development is permitted within the identified 'no-go' areas as detailed in **Figure 9.1**.
- Obtain all other mandatory and environmental permits/licenses for the project, as required.
- A pre-construction walk-through of the development footprint and power line corridor must be undertaken before construction commences and the layout and corridor should be adjusted, where required, to reduce impacts on species of conservation concern, habitats of concern and heritage resources.
- Minimise the development footprint as far as possible and rehabilitate disturbed areas that are not required for the operation phase of the development.
- Regular monitoring for alien plant invasion and erosion after construction to ensure that no invasion or erosion problems have developed as result of the disturbance must be undertaken.
- Placement of electrical infrastructure should consider avifaunal sensitivity zones and avoid areas of higher sensitivities where possible.
- Overhead power lines must be of a design that minimises electrocution risk by using adequately insulated 'bird friendly' monopole structures, with clearances between live components and possible bird perches (e.g., cross arms) of 1.8m or greater. Each pylon should be fitted with a safe bird perch.
- The ephemeral drainage line within the site must be avoided.
- Towers/pylons associated with the grid connection must be placed outside of any high SEI areas.
- If the site is going to be impacted and the graves need to be removed, a grave relocation process for the site is recommended as a mitigation and management measure. This will involve the necessary social consultation and public participation process before grave relocation permits can be applied for with the HWCunder the NHRA and National Health Act regulations.
- Implement a chance finds procedure for the rescuing of any fossils or heritage resources discovered during construction.

» The developer should encourage the EPC contractor to increase the local procurement practices and promote the employment of people from local communities, as far as feasible, to maximise the benefits to the local economies.
» The developer should engage with local authorities and business organisations to investigate the possibility of procuring construction materials, goods and products from local suppliers were feasible.

A validity period of 15 years of the Environmental Authorisation is requested, should the project obtain approval from DFFE.

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