BASIC ASSESSMENT PROCESS

for

THE PROPOSED CONSTRUCTION OF PAULPIETERSBERG TELECOMMUNICATION RADIO TOWER WITHIN eDumbe Local Municipality, KWAZULU-NATAL PROVINCE

DRAFT BASIC ASSESSMENT REPORT

Public Review

03 August 2023 to 04 September 2023

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PROJECT DETAILS

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Title	:	Basic Assessment Process for the Proposed Construction of **Paulpietersberg Telecommunication Radio Tower** within eDumbe Local Municipality, KwaZulu-Natal Province
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ABBREVIATIONS AND ACRONYMS

BAR	Basic Assessment Report
CBA	Critical Biodiversity Area
DFFE	Department of Forestry, Fisheries and Environment
DoE	Department of Energy
DMR	Department of Mineral Resources
DWS	Department of Water and Sanitation
EAP	Environmental Assessment Practitioner
EIS	Ecological Importance & Sensitivity
EMPr	Environmental Management Programme
EIA	Environmental Impact Assessment
ERA	Electricity Regulation Act (No. 4 of 2006)
ESA	Ecological Support Area
GN	Government Notice
Ha	Hectares
HIA	Heritage Impact Assessment
I&APs	Interested and Affected Parties
IDP's	Integrated Development Plans
Km	Kilometres
Kv	kilovolts
KZN	Kwa-Zulu Natal
KZN EDTEA	KwaZulu-Natal Department of Economic Development, Tourism and Environmental Affairs
m	Meters
MW	Megawatts
NEMA	National Environmental Management Act (No. 107 of 1998) (as amended)
NHRA	National Heritage Resources Act (No. 25 of 1999)
NWA	National Water Act (No 36 of 1998)
PES	Present Ecological State
SACAA	South African Civil Aviation Authority
SAHRA	South African Heritage Resources Agency
SDF	Spatial Development Framework
VAC	Visual Absorption Capacity
ZMVE	Zone of Maximum Visual Exposure
ZVI	Zone of Visual Influence

EXECUTIVE SUMMARY

INTRODUCTION

Transnet is South Africa's sole provider of rail transport infrastructure for coal transportation. One of South Africa's largest foreign exchange earners is the export of high-quality coal products to China. The Transnet rail link between the coal fields in Mpumalanga Province and the export node, the Richards' Bay Coal Terminal, is one of the busiest railway links in South Africa. The increase in demand for South Africa's high-quality coal necessitates the increase in production, which in turn has demands on the railway network infrastructure. In response to the increased demand for South Africa's coal in the global market place, Transnet needs to increase the volume of coal that is being transported between the Mpumalanga coal fields and the Richard's Bay Coal Terminal. This increase will be facilitated through capital expenditure on two fronts, the supporting infrastructure, i.e. the electrical network supplying the locomotives and the locomotives themselves. In order for Transnet to accomplish the above they need to upgrade their power supply to their various traction substations between Ermelo and Richards Bay to facilitate the introduction of the new, larger locomotives that will be added to increase the volume of coal being transported and exported. Eskom Holdings SOC Ltd being one of the main suppliers of electrical energy in South Africa has been tasked by Transnet to supply the additional energy requirements to these traction substations.

In order to address this request, various projects were proposed including the Construction of Nzalo and Duma 400kV Main Transmission Stations and the associated 88kV and 400kV Turn in Powerlines in Kwazulu Natal Province. Transnet Freight Rail Coal Line Upgrade Project Overview as shown in **Figure 1** can be summarised as follows:

- 3 x New Transmission Main Transmission Substations (MTSs) (Madlanziniin Mpumalanga, Nzalo and Duma in KZN) received Environmental Authorisationsin 2015.
- Eskom Telecoms required to provide communication services for the three MTSs.
- 4 x New Radio Sites required:
    - Two new Greenfield sites for Duma Ss; and
    - Louwsbergand Paulpietersbergsites for NzaloSs.
    - Duma RS (within approved Duma Substation footprint)
    - Upgrade 2 x Existing RSs

The proposed telecommunication mast would serve as voice, data as well as other telecommunications and ancillary services for Eskom staff and contractors for the Nzalo Substation which is positioned 27 36 31.11 S and 30 52 30.22 E, this is a new substation to be built by Transmission (Tx) Telecommunications in order to strengthen the TX grid so that Eskom can provide services to Transnet. In order for Eskom to provide the necessary it is imperative that there are reliable and effective communications systems in place to provide the necessary services to the substation. Services like tele-protection, tele-control, switched voice, direct voice and hot lines as well as data services like Ethernet connectivity. The mast will be located within eDumbe Local Municipality in Kwazulu-Natal (**Figure 2**). The Mast will be approximately. 60m in height requiring a foot print of 30m X 30m.

REQUIREMENT FOR A BASIC ASSESSMENT PROCESSNTRODUCTION

The proposed project is subject to the requirements of the Environmental Impact Assessment Regulations of 2014 EIA Regulations (as amended) in terms of the National Environmental Management Act (NEMA, Act 107 of 1998, as amended). NEMA is national legislation that provides for the authorisation of certain controlled activities known as "listed activities". In terms of Section 24(1) of NEMA, the potential impact on the environment associated with these 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 environmental authorisation. Eskom requires an Environmental Authorisation for this project which includes the proposed construction of an overhead powerline, underground cables and substations. Application for authorisation in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended and GNR 326, 327, 325 & 324 of the Environmental Impact Assessment Regulations, 2014 as amended (07 April 2017) a Basic Assessment (BA) Process is required for this project.

An environmental impact assessment is an effective planning and decision-making tool for the applicant as it provides the opportunity for the applicant to be fore-warned of potential environmental issues and assess if potential environmental impacts need to be avoided, minimised or mitigated to acceptable levels. The Basic Assessment process includes certain feasibility studies for a proposed project and will inform the final design process in order to ensure that environmentally sensitive areas are avoided to an acceptable level as confirmed by the Environmental Assessment Practitioner (EAP). Comprehensive, independent environmental studies elaborated by specialists are required in accordance with the EIA Regulations to inform the EAP of its comprehensive recommendation and provide the competent authority with sufficient information in order to make an informed decision.

As the applicant for the project is Eskom Holdings SOC Ltd which is a State-Owned-Company (SOC), therefore the National Department of Forestry Fisheries and Environment (DFFE) is the competent authority and the KwaZulu-Natal Department of Economic Development and Environmental Affairs (KZNEDTEA) will act as a commenting authority. Eskom has appointed Envirolution Consulting (Pty) Ltd, as independent environmental consultants, to undertake the BA process and compile the BA Report and Environmental Management Programme (EMPr). Furthermore, Envirolution Consulting does not have any interests in secondary developments that may arise out of the authorisation of the proposed project. Envirolution Consulting is a specialist environmental consulting company providing holistic environmental management services, including environmental impact assessments and planning to ensure compliance with environmental legislation and evaluate the risk of development; and the development and implementation of environmental management tools Envirolution Consulting benefits from the pooled resources, diverse skills and experience in environmental field held by its team. We offer solutions to environmental issues that are key during our clients' planning and decision-making processes. The Envirolution Consulting team have considerable experience in environmental impact assessments and environmental management, and have been actively involved in undertaking environmental studies,

for a wide variety of projects in South Africa, including those associated with linear developments.

PROJECT NEED AND DESIRABILITY

The proposed telecommunication mast is required to serve as voice, data as well as other telecommunications and ancillary services for Eskom staff and contractors. The proposed mast installation project will align with Eskom's objectives to improve service levels and efficiencies to ensure volume growth, to meet core telecommunication specifications in support of maintenance standards.

Eskom Holdings SOC Ltd considers this area to be highly preferred for the development for the following reasons:
This spot is required because it best suits the needs to integrate back into the Eskom telecommunication's network. In order for Eskom to provide the necessary services it is imperative that there are reliable and effective communications systems in place to provide the necessary services to the substation.

The proposed project is part of a suite of projects collectively known as the Ermelo-Richards Bay Coal Link Upgrade. These suits of projects will impact positively on the local, provincial and national economies and ensure that South Africa continues to improve its national transport system, hereby increasing economic output and revenue. The eDumbe Local Municipality which have high levels of unemployment and this project may provide a much-required capital injection to the area, along with a number of job opportunities during the construction and operational phases.

CONCLUSION (IMPACT STATEMENT)

As summarised in Table 10, it's been noted that the majority of the negative impacts associated with the construction of the proposed Paulpietersburg Telecommunication Radio Tower are short-term (i.e. during the construction phase), **majority of the negative impacts identified can be mitigated to low significance** if all mitigation measures identified and included in the Environmental Management Programme (EMPr) attached in Appendix F. Owing to the fact that the project is for the provision of the requirement to serve as voice, data as well as other telecommunications and ancillary services for Eskom staff and contractors which are meant to improve service levels and efficiencies to ensure volume growth, to meet core telecommunication specifications in support of maintenance standards, most of the impacts resulting from the project aspects are anticipated to be positive more so in the long-term of the implementation of the project, these benefits of the project are expected to occur beyond the local area therefore the benefits partially offset the localised environmental costs of the project.
The most significant impact flagged is the tower collision mortality risk posed to threatened bird species as the project is situated on a highly elevated ground and hence sensitive position in any area often subject to poor visibility due to low cloud and mist. The specialist has proposed two mitigation actions to reduce the potential impacts by i) co-locating the new communication equipment on existing towers at the site, and ii) if this is not possible, that no lateral support cable be used in the tower design.
According to Eskom technical team, the two proposed mitigations are not technically feasible: Sharing with existing third party sites are not suitable due to the fact that the communication network that Eskom is providing is to monitor and control the power grid/system and it is imperative that this system is secure, safe and in control of Eskom to maintain and perform it duties when called upon to do so. Eskom cannot rely on third party should an emergency situation arise and Eskom personnel is required to access the site. Usually, building a site close or next to a third part site was also considered but found not suitable due mainly to having no LOS to existing sites. However, the proposed structure will be situated in an existing tower farm and at 60 m which is not particularly tall; in an attempt to mitigate some foreseen impacts. On the second point, Eskom have moved away from monopoles structures, this type as it is very difficult to maintain during its lifetime. In addition, Eskom doesn't have access to well proven technology in SA to ascertain the technical properties of the structure over its lifespan due to degradation that may occur due to any external factors. Eskom has also found that Lattice structures are more robust and durable for their network needs.

The findings this report indicate that there are no significant environmental fatal flaws associated with the proposed development, the majority of the negative impacts associated with the project are minor, the positive impacts outweigh the negatives considerably and thus, with the application of effective mitigation measures, the proposed project is regarded to be feasible and sustainable. Environmental constraints as listed on section 8.3 and shown in the environmental sensitivity map (**Figure 24**) includes are features that could be avoided during the detail design phase of the project, by careful placing of tower footprint. In addition, the proposed structure will be situated in an existing tower farm and at 60 m which is not particularly tall. Responsible environmental management will be required on site, during the planning and construction phases of the project. It is therefore the **opinion of the EAP that the proposed development could proceed** as all impacts identified are localised and manageable provided that the mitigation measures set out in this report (refer to section 8.5) and in the EMPr (Appendix F) are diligently implemented to limit the potential impacts on sensitive ecological and visual aspects of the project during construction and operation of the development.

.

RECOMMENDATIONS

The **EAP recommends** that the **construction of the proposed Paulpietersburg Telecommunication Radio Tower be authorised**. The construction activities and relevant rehabilitation of disturbed areas should be monitored against the approved EMPr, the Environmental Authorisation, specialist report recommendations and all other relevant environmental legislation. The following relevant **conditions would be required** to be included within an authorisation issued for the project.

- An independent Environmental Control Officer (ECO) should be appointed to monitor compliance with the specifications of the EMPr for the duration of the construction period.
- Security lighting for on-ground facilities, equipment, and infrastructure should be avoided. If not possible, lighting should be motion or heat-sensitive, down-shielded, and of a minimum intensity to reduce night-time bird attraction and eliminate constant night-time illumination while still allowing safe night-time access to the site.
- Creation of new access roads should be minimised as far as possible. Rock outcrop habitats must be avoided by access / service roads
- Stormwater Management Plan is established for the Service Road. All erosion protection measures must be established to reflect the natural slope of the surface and located at the natural ground-level.
- Threatened and Protected Plant Search and Rescue: Prior to construction commencing, the following must be undertaken:
    - The protected *Moraea* individuals within and in the vicinity of the development footprint must be relocated to the primary grassland areas downslope by a person with suitable horticultural experience, and in particular experience in relocating indigenous plants within natural habitats. The

translocation should occur in mid-summer to ensure that all individuals are picked up during the relocation.
    - Permits to translocate such species must be acquired and a search and rescue plan must be compiled and implemented.
- A detailed method statement for the construction activities within all primary grasslands must be compiled and appended to the construction (EMPr) prior to construction commencing. The final method statement must be reviewed by the ECO prior to commencement and must include all measures provided in this section where relevant and applicable
- Demarcation of 'No-Go' areas and construction corridors
- Should any archaeological artefacts be exposed during excavation, work on the area where the artefacts were found, shall cease immediately and the ECO shall be notified as soon as possible. Any archaeological sites exposed during construction activities may not be disturbed prior to authorisation by the South African Heritage Resources Agency.
- All relevant practical and reasonable mitigation measures detailed within this report and within the EMPr must be implemented. The implementation of this EMPr for all life cycle phases of the proposed project is considered key in achieving the appropriate environmental management standards as detailed in this report
- All declared alien plants must be identified and managed in accordance with the Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983). The implementation of a monitoring programme in this regard is recommended.
- Care must be taken with the topsoil during and after construction on the site. If required, measures to reduce erosion to be employed until a healthy plant cover is again established.
- Contractors must be informed before construction starts on the possible types of heritage sites and cultural material they may encounter and the procedures to follow when they find sites.
- The developer should obtain all necessary permits prior to the commencement of construction.
- On-going monitoring of the development sites must be undertaken to detect and restrict the spread of alien plant species

INVITATION TO COMMENT ON THE DRAFT BA REPORT

The Draft Basic Assessment Report (BAR) has been prepared by Envirolution Consulting (Pty) Ltd in order to assess the potential environmental impacts associated with the proposed construction of the **Paulpietersberg Telecommunication Radio Tower**. The report is made available for public review for 30-day review period from **03 August 2023 to 04 September 2023** at the following place:

Paulpietersburg Library
10 Hoog Street, Paulpietersburg
034 995 1650

In order to obtain further information or submit written comments please contact:

Environmental Assessment Practitioner

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The due date for comments on the Draft Basic Assessment Report is Monday, 04 September 2023
.

1 INTRODUCTION

1.1 Project Background

The proposed construction of Paulpietersberg Telecommunication Radio Tower Project within the eDumbe Local Municipality is part of a suite of projects collectively known as the Transnet Coal Link Upgrade.

Transnet is South Africa's sole provider of rail transport infrastructure for coal transportation. One of South Africa's largest foreign exchange earners is the export of high-quality coal products to China. The Transnet rail link between the coal fields in Mpumalanga Province and the export node, the Richards' Bay Coal Terminal, is one of the busiest railway links in South Africa. The increase in demand for South Africa's high-quality coal necessitates the increase in production, which in turn has demands on the railway network infrastructure. In response to the increased demand for South Africa's coal in the global market place, Transnet needs to increase the volume of coal that is being transported between the Mpumalanga coal fields and the Richard's Bay Coal Terminal. This increase will be facilitated through capital expenditure on two fronts, the supporting infrastructure, i.e. the electrical network supplying the locomotives and the locomotives themselves. In order for Transnet to accomplish the above they need to upgrade their power supply to their various traction substations between Ermelo and Richards Bay to facilitate the introduction of the new, larger locomotives that will be added to increase the volume of coal being transported and exported. Eskom Holdings SOC Ltd being one of the main suppliers of electrical energy in South Africa has been tasked by Transnet to supply the additional energy requirements to these traction substations.

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    - Duma RS (within approved Duma Substation footprint)
    - Upgrade 2 x Existing RSs

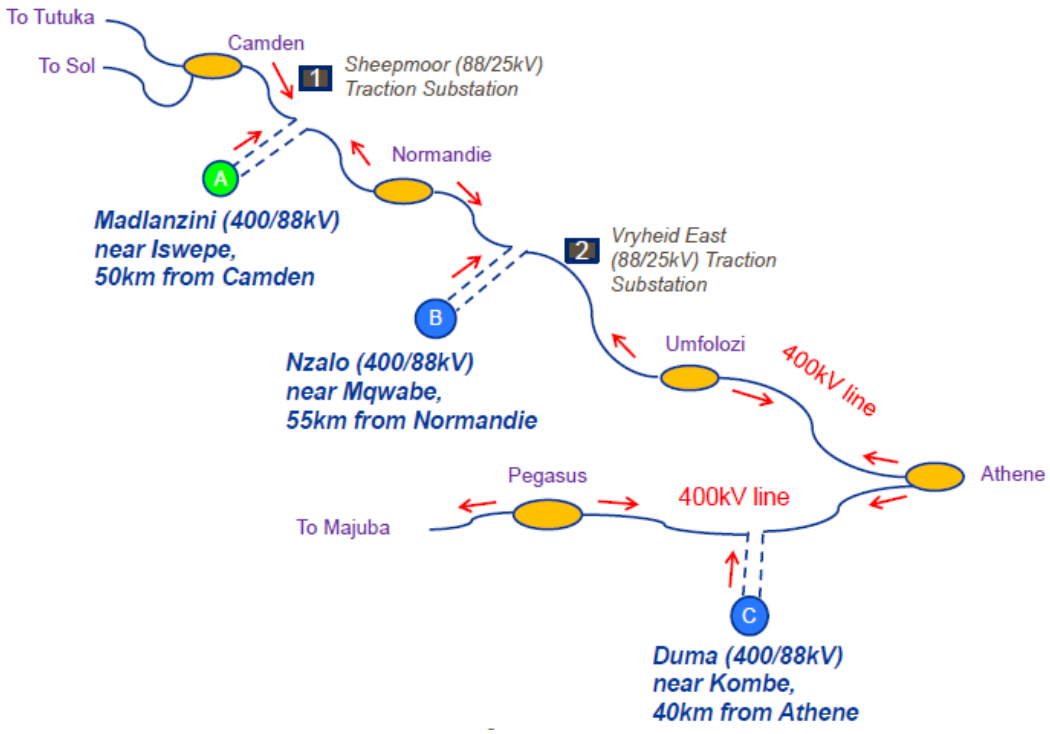

Figure 1: Transnet Project Overview

The proposed telecommunication mast would serve as voice, data as well as other telecommunications and ancillary services for Eskom staff and contractors for the Nzalo Substation which is positioned 27 36 31.11 S and 30 52 30.22 E, this is a new substation to be built by Transmission (Tx) Telecommunications in order to strengthen the TX grid so that Eskom can provide services to Transnet. In order for Eskom to provide the necessary it is imperative that there are reliable and effective communications systems in place to provide the necessary services to the substation. Services like tele-protection, tele-control, switched voice, direct voice and hot lines as well as data services like Ethernet connectivity. The mast will be located within eDumbe Local Municipality in Kwazulu-Natal (**Figure 2**). The Mast will be approximately. 60m in height requiring a foot print of 30m X 30m.

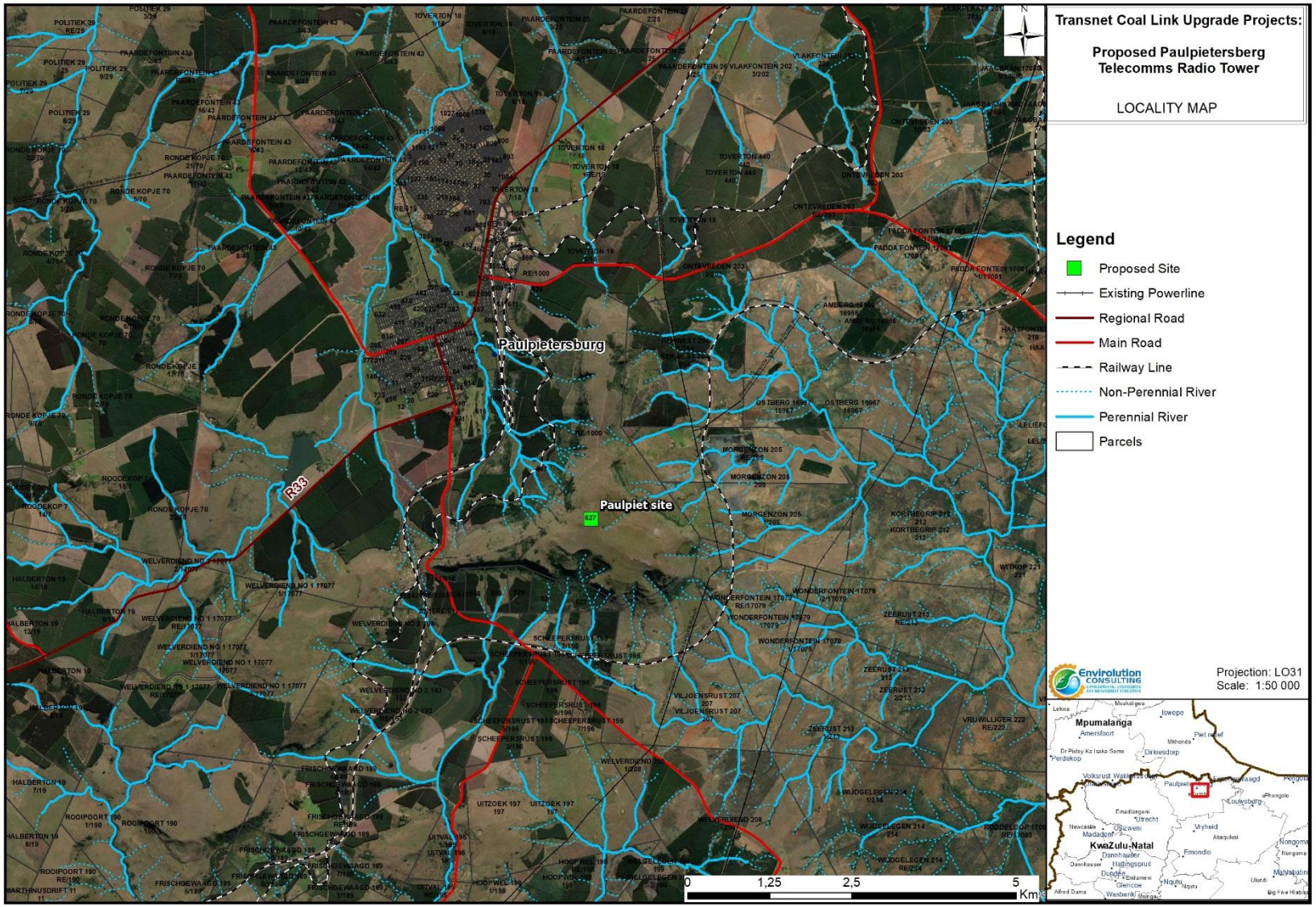

Figure 2: Locality map showing the proposed Paulpietersberg Telecommunication Radio Tower

1.2 Requirement for a Basic Assessment Process

The proposed project is subject to the requirements of the Environmental Impact Assessment Regulations of 2014 EIA Regulations (as amended) in terms of the National Environmental Management Act (NEMA, Act 107 of 1998, as amended). NEMA is national legislation that provides for the authorisation of certain controlled activities known as "listed activities". In terms of Section 24(1) of NEMA, the potential impact on the environment associated with these 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 environmental authorisation. Eskom requires an Environmental Authorisation for this project which includes the proposed construction of an overhead powerline, underground cables and substations. Application for authorisation in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended and GNR 326, 327, 325 & 324 of the Environmental Impact Assessment Regulations, 2014 as amended (07 April 2017) a Basic Assessment (BA) Process is required for this project.

An environmental impact assessment is an effective planning and decision-making tool for the applicant as it provides the opportunity for the applicant to be fore-warned of potential environmental issues and assess if potential environmental impacts need to be avoided, minimised or mitigated to acceptable levels. The Basic Assessment process includes certain feasibility studies for a proposed project and will inform the final design process in order to ensure that environmentally sensitive areas are avoided to an acceptable level as confirmed by the Environmental Assessment Practitioner (EAP). Comprehensive, independent environmental studies elaborated by specialists are required in accordance with the EIA Regulations to inform the EAP of its comprehensive recommendation and provide the competent authority with sufficient information in order to make an informed decision.

As the applicant for the project is Eskom Holdings SOC Ltd which is a State-Owned-Company (SOC), therefore the National Department of Forestry Fisheries and Environment (DFFE) is the competent authority and the KwaZulu-Natal Department of Economic Development and Environmental Affairs (KZNEDTEA) will act as a commenting authority. Eskom has appointed Envirolution Consulting (Pty) Ltd, as independent environmental consultants, to undertake the BA process and compile the BA Report and Environmental Management Programme (EMPr). Furthermore, Envirolution Consulting does not have any interests in secondary developments that may arise out of the authorisation of the proposed project. Envirolution Consulting is a specialist environmental consulting company providing holistic environmental management services, including environmental impact assessments and planning to ensure compliance with environmental legislation and evaluate the risk of development; and the development and implementation of environmental management tools Envirolution Consulting benefits from the pooled resources, diverse skills and experience in environmental field held by its team. We offer solutions to environmental issues that are key during our clients' planning and decision-making processes. The Envirolution Consulting team have considerable experience in environmental impact assessments and environmental management, and have been actively involved in undertaking environmental studies, for a wide variety of projects in South Africa, including those associated with linear developments.

1.3 Project Team

Envirolution Consulting (Pty) Ltd was contracted by Eskom Holdings SOC Ltd as the independent environmental consultant to undertake the Environmental Basic Assessment process for the proposed project. Envirolution Consulting (Pty) Ltd is not a subsidiary of, or affiliated to Eskom Holdings SOC Ltd. Furthermore, Envirolution Consulting does not have any interests in secondary developments that may arise out of the authorisation of the proposed project.

I. APPLICANT DETAILS

Name of applicant:	Eskom Holdings SOC Ltd
Applicant representative:	Tobile Bokwe
Position:	Programme Manager: Land Development
Contact number/s:	011 800 2303
Physical address:	Transmission Division Grid Planning & Development Megawatt Park D1X37 Maxwell Drive Sunninghill Sandton
E-mail:	bokwett@eskom.co.za

II. ENVIRONMENTAL ASSESSMENT PRACTITIONER (EAP)'s DETAILS

Environmental Assessment Practitioner (EAP):	Karthigesan Govender		
Contact person:	Sheila Bolingo		
Postal address:	PO Box 1898, Sunninghill		
Postal code:	2157		
Telephone:	087 898 5000	Cell:	083 419 8905
E-mail:	sheila@envirolution.co.za; gesan@envirolution.co.za	Fax:	(086) 162 62 22
EAP Qualifications	BSc (Hons) in Botany		
EAP Registrations/ Associations	Registered with the South African Council for Natural Scientific Professions (No: 400049/12)		

Details of the EAP's expertise to carry out Basic Assessment procedures

The EAPs from Envirolution Consulting who are responsible for this project are (refer to **Appendix G1** for CVs):

- **Sheila Bolingo,** the principle author of this Report holds an Msc degree in Environmental Management with 12 years of experience in the consulting field. Her key focus areas are on strategic environmental assessment and advice on environmental impact assessments; public participation; environmental management programmes, and mapping through ArcGIS for variety of environmental projects. She is currently involved in several diverse projects across the country.

- **Karthigesan Govender** The Environmental Assessment Practitioner (EAP) is a registered Professional Natural Scientist and holds an Honours degree in Botany. He has over 18 years of experience within the field of environmental management. His key focus is on strategic environmental assessment and advice; management and co-ordination of environmental projects, which includes integration of environmental studies and environmental processes into larger engineering-based projects and ensuring compliance to legislation and guidelines; compliance reporting; the identification of environmental management solutions and mitigation/risk minimising measures; and strategy and guideline development. He is currently responsible for the project management of EIA's for several diverse projects across the country.

III. SPECIALIST DETAILS

In order to adequately identify and assess potential environmental impacts associated with the proposed project, Envirolution Consulting has appointed the following specialists to conduct specialist impact assessments:

- Aquatic and wetland impact assessment – Ryan Edwards of Verdant Environmental
- Terrestrial ecological –Ryan Edwards & team of Verdant Environmental
- Avifauna - David Allan & Robyn Phillips of Cossypha Ecological
- Heritage - Johan van Schalkwyk of Johan Heritage Consultant
- Palaeontology - Heidi Fourie
- Visual – Mader van den Berg of Skets
- Agricultural Potential – Joshua Oluokun of Environet Consulting

Specialist declarations are included in **Appendix G2**

2 PROJECT DESCRIPTION

2.1 Project Location

The proposed telecommunication mast would serve as voice, data as well as other telecommunications and ancillary services for Eskom staff and contractors. In order for Eskom to provide the necessary it is imperative that there are reliable and effective communications systems in place to provide the necessary services to the substation. Services like tele-protection, tele-control, switched voice, direct voice and hot lines as well as data services like Ethernet connectivity.

The proposed Tower will be located approximately 5km south east of the town of Paulpietersberg (Ward 3) within the eDumbe Local Municipality in the Zululand District Municipality

The proposed mast will be located on the following property:

- RE of ERF 1000 PAULPIETERSBERG
- SGID: N0HT02540000100000000

At the following coordinates:
Lat: 27°26'51.00"S
Long: 30°50'31.00"E

Figure 3 illustrates the project location (A3 Locality map provided in Appendix A1). Access to the site is to comprise a single-lane gravel access road; this will be approximately 2000m long from the town of Paulpietersberg.

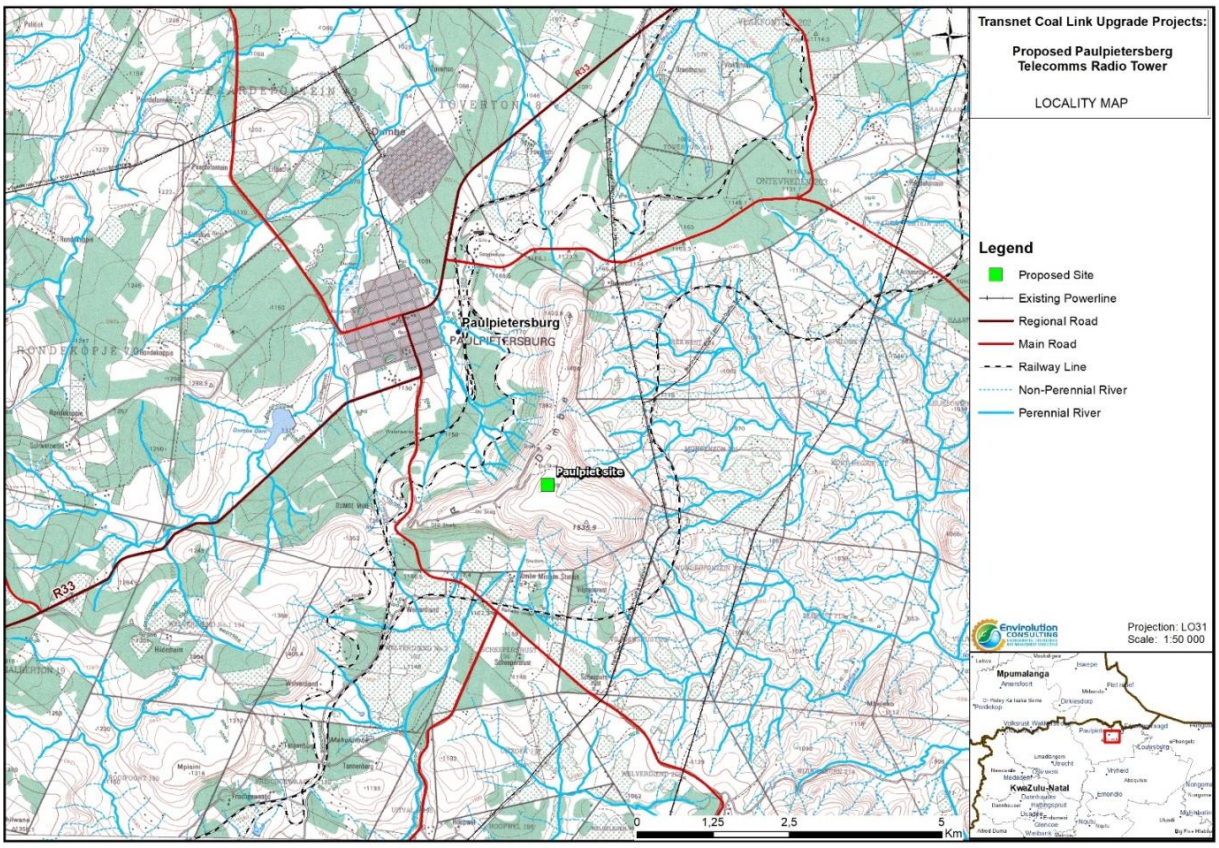

Figure 3: Locality Map

2.2 Technical Details

The proposed development entails the following:

- The erection of an approximately 60m Telecommunications tower Mast in height
- The size of the site will occupy a 30m X30m foot print
- Fenced off with a fence as per the current Eskom specification at time of build.
- There will either be a brick building or container built on site as per Eskom requirements to house the indoor equipment.

2.3 Alternatives Description

2.3.1 Site Alternatives

An intensive investigation was carried out by Telecomms planning engineer together with a qualified land surveyor over a period of 18 months. Sites visits were done to verify any man-made physical structures and the actual terrain on sites as shown in **Figure 4**. Even though there were other sites in the vicinity most of them could not offer solution because of the obstructed LOS since the link path profile design requires a clear line of sight between the two ends of a microwave link for it to be successful. The Paulpietersburg RS (south of the site) was investigage but it was realised that there was no space on mountain top to extend the site, **for the above reasons only one feasible site (Paulpietersburg ALT RS) is proposed for the Paulpietersburg Telecomms.**

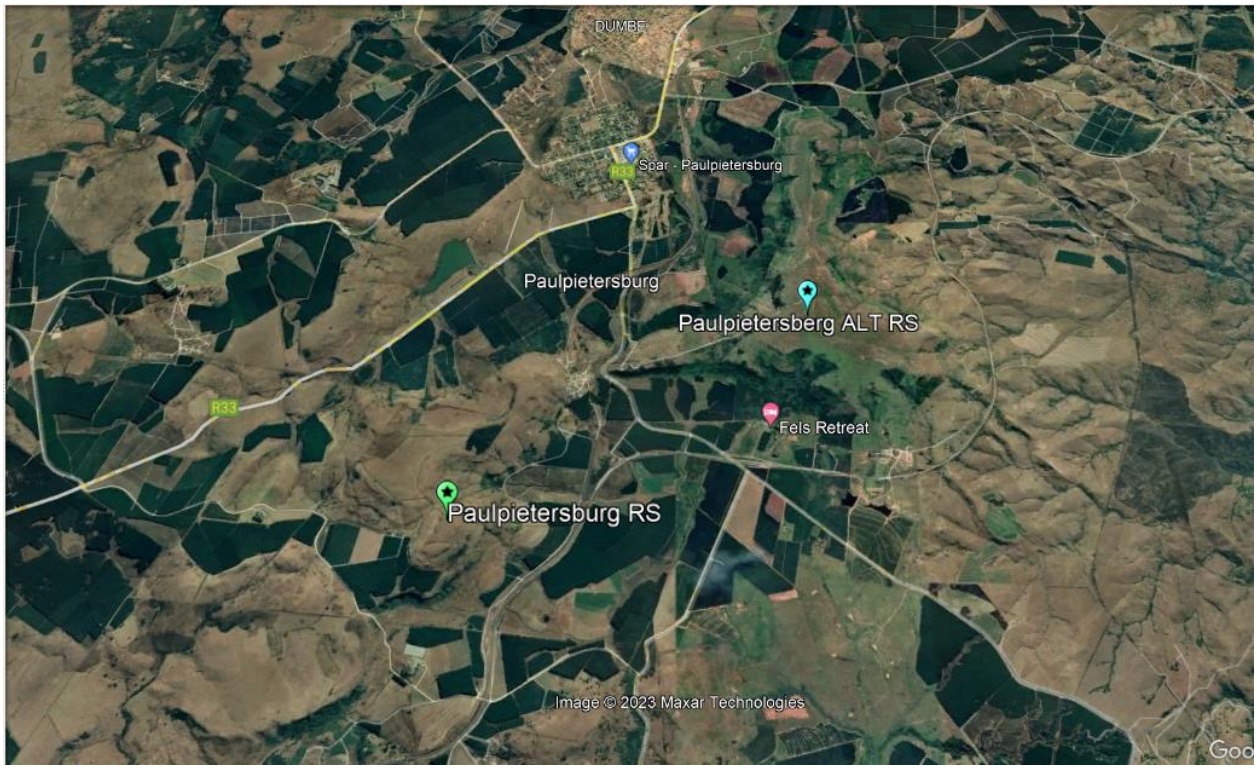

Figure 4: Telecomms Site alternative investigations

2.3.2 Design Alternative

Two **tower design** alternatives have been investigated by the team namely:

Lattice Towers

Also referred to as "self-supporting towers", lattice towers are typically made from steel and constructed in a triangular or square shape. These towers often offer the most stability and flexibility as compared to other cell tower types.

Monopole Towers

A single tubular mast comprises this type of cell tower; because of the instability that comes with the use of a single pole, the height of these structures will not exceed 200 feet. A benefit of this tower type is that it requires little ground space to erect, and the antennae are simply mounted to the top-exterior of the mast.

The preferred tower type by Eskom is a self-supporting steel lattice tower (**Figure 5** for example). *Eskom has moved away from this type as it is very difficult to maintain during its lifetime. According to the Eskom technical team, they currently don't have access to well proven technology in SA to ascertain the technical properties of the structure over its lifespan due to degradation that may occur due to any external factors. We have also found that Lattice structures are more robust and durable for our network needs*

Figure 5: Typical telecom tower

2.3.3 **No-go alternative**

The No-Go alternative in the context of this project implies that the telecommunication mast would not be constructed and the current land use would persist. If the project does not proceed the negative impacts such as risk of collisions of birds would be avoided. However, it would also mean that the project would not provide the requirement to serve as voice, data as well as other telecommunications and ancillary services for Eskom staff and contractors which are meant to improve service levels and efficiencies to ensure volume growth, to meet core telecommunication specifications in support of maintenance standards.

Based on above points, the 'No-go' alternative is therefore not considered to be a feasible alternative and will not be considered further within the EIA process.

2.4 Need and Desirability

The proposed telecommunication mast is required to serve as voice, data as well as other telecommunications and ancillary services for Eskom staff and contractors. The proposed mast installation project will align with Eskom's objectives to improve service levels and efficiencies to ensure volume growth, to meet core telecommunication specifications in support of maintenance standards.

Eskom Holdings SOC Ltd considers this area to be highly preferred for the development for the following reasons: This spot is required because it best suits the needs to integrate back into the Eskom telecommunication's network. In order for Eskom to provide the necessary services it is imperative that there are reliable and effective communications systems in place to provide the necessary services to the substation.

The proposed project is part of a suite of projects collectively known as the Ermelo-Richards Bay Coal Link Upgrade. These suits of projects will impact positively on the local, provincial and national economies and ensure that South Africa continues to improve its national transport system, hereby increasing economic output and revenue. The eDumbe Local Municipality which have high levels of unemployment and this project may provide a much-required capital injection to the area, along with a number of job opportunities during the construction and operational phases.

2.5 Construction & Operation of the Tower Procedure

The proposed telecommunication radio tower project is considered a medium scale development that will require specialist construction methods to erect it. The footprint of the tower is only 30mx30m, but its vertical dimension reaches 60m. Limited detail and descriptive information are available, but one can assume the following typical construction phases may occur:

- Surveying of the site;
- Establishment of a temporary construction camp and material stockyard that could be on- or off site depending on suitability;
- Installation of a power supply (no details available);
- Civil works which include an access road if not already present, foundation casting and erection of the tower;
- Construction of security features such as a fence; and
- Commissioning and rehabilitation.

The establishment of a construction camp is usually one of the first interventions on a construction site and is normally located on or near the site. Temporary site offices and ablution facilities may be required next to a material laydown yard. Due to its temporary nature and practical function, aesthetic considerations are less of a concern which could result in an unsightly terrain that may cause visual intrusion.
Earthworks for foundation purposes will be one of the most intrusive activities and will presumably consist of excavation via appropriate machinery followed by foundation casting. The erection of the tower could involve the use of a mobile crane or even helicopters, depending on site conditions.
No clear construction period has been determined. One can expect a relatively short construction period of a few months

The final project will entail a 60m tall lattice tower, typically painted with white and red, or as per aviation authority requirements. It will be equipped with radios and dishes near the top. A red blinking light is expected to be installed at the top, as a notice to air traffic at night. Once the tower is constructed a routine maintenance program will be followed. No specifics are available, but no additional visual impacts are expected.

3 LEGAL FRAMEWORK AND REQUIREMENTS

3.1 Listed Activities

In terms of sections 24(2) and 24D of the National Environmental Management Act (Act No. 107 of 1998), as read with the Environmental Impact Assessment (EIA) Regulations of GNR 326, 327, 325 & 324 (as amended), a Basic Assessment process is required for the proposed project. **Table 1** contains the listed activities in terms of the EIA Regulations (as amended) and includes a description of those project activities which relate to the applicable listed activities.

Table 1: BA Listed Activities Applicable applied for to be authorise

Listed activities	Description of project activity that triggers listed activity
Activity 3 of Listing Notice 3 (GNR 324, 07 April 2017): The development of masts or towers of any material or type used for telecommunication broadcasting or radio transmission purposes where the mast or tower— (a) is to be placed on a site not previously used for this purpose; and (b) will exceed 15 metres in height— **(d) Kwazulu-Natal:** xi Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority	The mast will be 60m in height, thereby exceeding the 15m threshold, and falls within an area deemed Sensitive area by the competent authority
Activity 12 of Listing Notice 3 (GNR 324, 07 April 2017): The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of Indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan **(d) Kwazulu-Natal:** xii. Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority	The mast will require an area of 30mx30m i.e. 900 square metres clearance of indigenous vegetation in an area deemed Sensitive area by the competent authority

3.2 Legislation and Guidelines that have informed the preparation of this BA Report

Several other Acts, standards or guidelines have also informed the project process and the scope of issues assessed in this report. A listing of relevant legislation is provided in **Table 2**, where the level of applicability of the legislation or policy to the activity/project is detailed.

Table 2: Relevant legislative and permitting requirements applicable to the proposed project

LEGISLATION	APPLICABLE REQUIREMENTS	RELEVANT AUTHORITY
National Environmental Management Act (Act No 107 of 1998)	The EIA Regulations have been promulgated in terms of Chapter 5 of the Act. Listed activities which may not commence without an environmental authorisation are identified within these Regulations. In terms of S24(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. In terms of GNR 982 of 2014 (as amended), a Basic Assessment Process is required to be undertaken for the proposed project. • ***An application for Environmental Authorisation (as triggered by the EIA Regulations 2014 (as amended) will be required. In terms of Section 28, every person who causes, has caused, or may cause significant pollution or degradation of the environment, must take reasonable measures to prevent pollution or rectify the damage caused. The undertaking of various specialist studies, in order to identify potential impacts on the environment and to recommend mitigation measures to minimise these impacts, complies with Section 28 of NEMA. The developer must apply the NEMA principles, the fair decision-making and conflict management procedures that are provided for in NEMA. The developer must apply the principles of Integrated Environmental Management and consider, investigate and assess the potential impact of existing and planned activities on the environment, socio-economic conditions and the cultural heritage.*** • ***In terms of the EIA regulations, the construction of the proposed telecommunication mast will trigger the need for a Basic Assessment process under the NEMA EIA Regulations of 2014 (as amended) in Listing Notice 3 (refer to Section 4.1 for a detailed description of the listed activity applied for).***	Department of Forestry Fisheries and Environment (DFFE) – competent authority KwaZulu-Natal Department of Economic Development and Environmental Affairs (KZN EDTEA)
National Environmental Management Act (Act No 107 of 1998)	In terms of the Duty of Care Provision in S28(1) the project proponent must ensure that reasonable measures are taken throughout the life cycle of this project to ensure that any pollution or degradation of the environment associated with this project is avoided, stopped or minimised. In terms of NEMA, it has become the legal duty of a project proponent to consider a project holistically, and to consider the cumulative effect of a variety of impacts. ***While no permitting or licensing requirements arise directly by virtue of the proposed project, this section will find application during the BA phase and will continue to apply throughout the life cycle of the project.***	DFFE KZN EDTEA
National Water Act (Act No 36 of 1998)	The development also triggers activities that require a Water Use License (WUL) because it crosses several water courses. Therefore, before construction activities may take place, the activity will require a Water Use License as per requirement in the National Water Act (Act No.36 of 1998) (NWA) under Section 21 Water Uses. In terms of the NWA, this development requires a Water Use License for the following water uses: • Section 21(c) impeding or diverting the flow of water in a watercourse and; • Section 21 (i) altering the bed, banks, course or characteristics of a watercourse. ***Considering the negligible to likely non-existent impacts, it is debatable whether the project activities even constitute a Section 21(c) and 21(i) water use. This will need to be confirmed with the DWS. If the project activities are considered a water use, A General Authorisation will be applicable.***	Department of Water and Sanitation (DWS)

LEGISLATION	APPLICABLE REQUIREMENTS	RELEVANT AUTHORITY
National Environmental Management: Air Quality Act (Act No 39 of 2004)	S18, S19, and S20 of the Act allow certain areas to be declared and managed as "priority areas." Declaration of controlled emitters (Part 3 of Act) and controlled fuels (Part 4 of Act) with relevant emission standards. GN R 827 – National Dust Control Regulations prescribes general measures for the control of dust in all areas	DFFE Local Municipality
National Heritage Resources Act (Act No 25 of 1999)	» S38 states that Heritage Impact Assessments (HIAs) are required for certain kinds of development including » The construction of a road, power line, pipeline, canal or other similar linear development or barrier exceeding 300 m in length; » Any development or other activity which will change the character of a site exceeding 5 000 m^2 in extent » The relevant Heritage Authority must be notified of developments such as linear developments (i.e. roads and power lines), bridges exceeding 50 m, or any development or other activity which will change the character of a site exceeding 5 000 m^2; or the re-zoning of a site exceeding 10 000 m^2 in extent. This notification must be provided in the early stages of initiating that development, and details regarding the location, nature and extent of the proposed development must be provided. » Stand-alone HIAs are not required where an EIA is carried out as long as the EIA contains an adequate HIA component that fulfils the provisions of S38. In such cases only those components not addressed by the EIA should be covered by the heritage component. ***The Tower site is 30m x 30m hence an HIA is not required as the development which will not change the character of a site exceeding 5 000 m2. However, a permit may be required should identified cultural/heritage sites on site be required to be disturbed or destroyed as a result of the proposed development***	South African Heritage Resources Agency (SAHRA) AMAFA
National Environmental Management: Biodiversity Act (Act No 10 of 2004)	In terms of S57, the Minister of Environmental Affairs has published a list of critically endangered, endangered, vulnerable, and protected species in GNR 151 in Government Gazette 29657 of 23 February 2007 and the regulations associated therewith in GNR 152 in GG29657 of 23 February 2007, which came into effect on 1 June 2007. In terms of GNR 152 of 23 February 2007: Regulations relating to listed threatened and protected species, the relevant specialists must be employed during the EIA Phase of the project to incorporate the legal provisions as well as the regulations associated with listed threatened and protected species (GNR 152) into specialist reports in order to identify permitting requirements at an early stage of the EIA Phase. The Act provides for listing threatened or protected ecosystems, in one of four categories: critically endangered (CR), endangered (EN), 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 (National Environmental Management: Biodiversity Act: National list of ecosystems that are threatened and in need of protection, (GG 34809, GN 1002), 9 December 2011). GNR 598: The Alien and Invasive Species (AIS) Regulations provides for the declaration of weeds and invader plants. ***An ecological study has been undertaken as part of the BA process, as such the potential occurrence of critically endangered, endangered, vulnerable, and***	DFFE KZN EDTEA

LEGISLATION	APPLICABLE REQUIREMENTS	RELEVANT AUTHORITY
	protected species and the potential for them to be affected has been considered within this report.	
National Forests Act (Act No. 84 of 1998)	In terms of S5(1) no person may cut, disturb, damage or destroy any protected tree or possess, collect, remove, transport, export, purchase, sell donate or in any other manner acquire or dispose of any protected tree or any forest product derived from a protected tree, except under a license granted by the Minister to an (applicant and subject to such period and conditions as may be stipulated" GN 908 provides a list of protected tree species. ***While no permitting or licensing requirements arise from this legislation, and this Act will find application during the construction and operational phase of the project.***	Department of, Forestry, Fisheries and Environment (DFFE)
National Veld and Forest Fire Act (Act 101 of 1998)	In terms of S13 the landowner would be required to burn firebreaks to ensure that should a veldfire occur on the property, that it does not spread to adjoining land. In terms of S13 the landowner must ensure that the firebreak is wide and long enough to have a reasonable chance of preventing the fire from spreading, not causing erosion, and is reasonably free of inflammable material. In terms of S17, the applicant must have such equipment, protective clothing, and trained personnel for extinguishing fires. ***While no permitting or licensing requirements arise from this legislation, and this Act will find application during the construction and operational phase of the project.***	Department of, Forestry, Fisheries and Environment (DFFE)
Hazardous Substances Act (Act No 15 of 1973)	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, heat 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. ***It is necessary to identify and list all the Group I, II, III, and IV hazardous substances that may be on the site and in what operational context they are used, stored or handled. If applicable, a license is required to be obtained from the Department of Health***	Department of Health
National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008)	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.	DFFE: Chemicals and Waste Management KZN EDTEA: General waste

LEGISLATION	APPLICABLE REQUIREMENTS	RELEVANT AUTHORITY
	In terms of the Regulations published in terms of this Act (GN 921), A Basic Assessment or Environmental Impact Assessment is required to be undertaken for identified listed activities (Category A and B) while Category C Activities (such as storage of waste) must be undertaken in accordance with the necessary norms and standards. 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. ***As no waste disposal site is to be associated with the proposed project, no permit is required in this regard. Waste handling, storage and disposal during construction and operation is required to be undertaken in accordance with the requirements of the Act, as detailed in the EMPr. The volumes of waste to be generated and stored on the site during construction and operation of the facility will not require a waste license***.	
National Road Traffic Act (Act No 93 of 1996)	» The technical recommendations for highways (TRH 11): "Draft Guidelines for Granting of Exemption Permits for the Conveyance of Abnormal Loads and for other Events on Public Roads" outline the rules and conditions which apply to the transport of abnormal loads and vehicles on public roads and the detailed procedures to be followed in applying for exemption permits are described and discussed. » 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. ***An abnormal load/vehicle permit may be required to transport the various components to site for construction.***	Provincial Department of Transport
Conservation of Agricultural Resources Act (Act No 43 of 1983)	The Conservation of Agricultural Resources Act (CARA) (Act 43 of 1983) has categorised a large number of invasive plants together with associated obligations of the land owner. Invasive plant species that should be removed or maintained only under certain commercial situations are identified in terms of the CARA. This Act will be applicable to the project if and where such plants arise within or adjacent to the project area. Notably most listed alien invasive species are propagated and driven by the disturbance of land during and following construction. ***While no permitting or licensing requirements arise from this legislation, this Act will find application during the BA process and will continue to apply throughout the life cycle of the project.***	DFFE
Telecommunications Act, 1966 (Act No. 103 of 1966)	Transnet has authority to operate its Private Telecommunication Network (PTN) in terms of Section 41(1)(c) of the Telecommunications Act.	
Aviation Act, 1962 (Act No. 74 of 1962): 13th	Any communications structure, building or other structure, whether temporary or permanent, which has the potential to endanger aviation in navigable airspace, or has	

LEGISLATION	APPLICABLE REQUIREMENTS	RELEVANT AUTHORITY
Amendment of the Civil Aviation Regulations 1997	the potential to interfere with the operation of navigation or surveillance systems or Instrument Landing Systems, including meteorological systems for aeronautical purposes, is considered an OBSTACLE and shall be submitted to the Commissioner for Civil Aviation for evaluation (refer SA-CAR Part 139.01.33) ***Due to requirements of the Act to ensure the safety of aircrafts, the developer must engage directly with the Civil Aviation Authority regarding the structural details of the facility. The developer must ensure that aviation impacts are prevented by ensuring that the mast are clearly visible to air traffic. The mast will be equipped with navigations lights. The mast will not be located in close proximity to any runways that could affect safety of planes approaching/leaving a runway.***	
PROVINCIAL		
KwaZulu-Natal Nature Conservation Management Amendment Act, 1997 (No 5 of 1999)	The KZN Conservation Management Amendment Act (1999) provides for the establishment of the KZN Conservation and prescribes its powers, duties and functions which include • Direct Nature management; and • Direct protected areas management ***The ecological Impact Assessment is being undertaken to confirm presence of projected plan under the Act, this will guide whether permit is required for the destruction of removal of certain species.***	KZN EDTEA Ezemvelo KZN wildfire (EKZNW)
KwaZulu-Natal Environmental Biodiversity Protected Areas Management Bill, 2014	The KZN Environmental Biodiversity Protected Areas Management Bill of 2014 provides for the establishment, functions and powers of the Ezemvelo KZN Wildfire the protection and conservation of indigenous species, ecological communities, habitats and ecosystems, the sustainable use of indigenous biological resources and the declaration and management of protected areas; • Schedule 3, 7 and 8 of includes the lists of protected fauna and flora species. ***The ecological Impact Assessment is being undertaken to confirm presence of projected plan under the Act, this will guide whether permit is required for the destruction of removal of certain species. The ecological Impact Assessment is being undertaken to confirm presence of projected plan under the Act, this will guide whether permit is required for the destruction of removal of certain species.***	KZN EDTEA Ezemvelo KZN wildfire (EKZNW)
KwaZulu-Natal Systematic Conversation Plan (KZNSCP, 2012)	The process of conservation planning involves extensive mapping of vegetation types, transformation, species data, ecological processes and threats. ***The proposed development needs to consider the future conservation planning of the area in order to ensure that no conflict in the future land-use will occur.***	Ezemvelo KZN wildfire (EKZNW)

3.3 Guidelines documents and standards

The following Guideline documents have been considered in the preparation of this report:

- South African National Standards (SANS) 10328 (Methods for environmental noise impact assessment in terms of Nema 107 of 1998);
- The Equator Principles (June 2003);
- Department of Environmental Affairs (DEA) Integrated Environmental Management Guideline Series 7, Public Participation in the EIA Process as published in Government Gazette No. 33308, 18 June 2010; and
- KwaZulu-Natal Spatial Development Framework
- District and Local municipality Integrated Development Plans (IDPs) and Spatial Development Frameworks (SDFs).
- Municipal by-laws and guidelines.

3.4 Summary of the Requirements Of Appendix 1 of the 2014 NEMA EIA Regulations

The below details how the legal requirements of APPENDIX 1 of the 2014 EIA Regulations **(**as amended, GNR326 **Table 3)** have been addressed within this report.

Table 3: Legal requirements in terms of the 2014 EIA regulations

Appendix 1: CONTENT OF BASIC ASSESSMENT REPORTS	**Cross-reference in this BAR report**
Scope of assessment and content of basic assessment reports	
3. (1) A basic assessment report must contain the information that is necessary for the competent authority to consider and come to a decision on the application, and must include— **(a)** details of— (i) the EAP who prepared the report; and (ii) the expertise of the EAP, including a curriculum vitae;	Appendix G1
(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; iii. where the required information in items (i) and (ii) is not available, the coordinates of the boundary of the property or properties;	Appendix G3
(c) a plan which locates the proposed activity or activities applied for as well as associated structures and infrastructure at an appropriate scale; or, if it is- i. a linear activity, a description and coordinates of the corridor in which the proposed activity or activities is to be undertaken; or ii. on land where the property has not been defined, the coordinates within which the activity is to be undertaken;	Appendix A & Appendix G3
(d) a description of the scope of the proposed activity, including— i. all listed and specified activities triggered and being applied for; and ii a description of the activities to be undertaken including associated structures and infrastructure;	Section 3.1 Section 2.2
(e) a description of the policy and legislative context within which the development is proposed including— iii. an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks, and instruments that are applicable to this activity and have been considered in the preparation of the report; and iv. how the proposed activity complies with and responds to the legislation and policy context, plans, guidelines, tools frameworks, and instruments;	Section 3.2
(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;	Section 2.3
(g) a motivation for the preferred site, activity and technology alternative;	Section 2.3)
(h) a full description of the process followed to reach the proposed preferred alternative within the site, including— i. details of all the alternatives considered; ii. details of the public participation process undertaken in terms of regulation 41 of the Regulations, including copies of the supporting documents and inputs; 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; iv. the environmental attributes associated with the alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;	i. Section 2.4 ii. Chapter 4 & Appendix D iii. Appendix D: Public Participation Process iv. Chapter 5 v. Chapter 6 vi. Chapter 7 vii. Chapter 7 viii. Chapter 7 ix. Chapter 7 x. Section 2.4 xi. Section 8.4

v. the impacts and risks identified for each alternative, including the nature, significance, consequence, extent, duration and probability of the impacts, including the degree to which these impacts— (aa) can be reversed; (bb) may cause irreplaceable loss of resources; and (cc) can be avoided, managed or mitigated; 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; 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; viii. the possible mitigation measures that could be applied and level of residual risk; ix. the outcome of the site selection matrix; x. if no alternatives, including alternative locations for the activity were investigated, the motivation for not considering such; and xi. a concluding statement indicating the preferred alternatives, including preferred location of the activity;	
(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;	Chapter 7
(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;	Chapter 7
(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;	Chapter 8 (section 8.1)
(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 tha should be avoided, including buffers; and (iii) a summary of the positive and negative impacts and risks of the proposed activity and identified alternatives;	Chapter 8 (section 8.4)
(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;	Appendix E
(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;	Chapter 8
(o) a description of any assumptions, uncertainties, and gaps in knowledge which relate to the assessment and mitigation measures proposed;	Chapter 6 (Section 6.7)

(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;	Chapter 8 (Section 8.4)
(q)	where the proposed activity does not include operational aspects, the period for which the environmental authorisation is required, the date on which the activity will be concluded, and the post construction monitoring requirements finalised;	N/A
(r)	an undertaking under oath or affirmation by the EAP in relation to— (i) the correctness of the information provided in the reports; (ii) the inclusion of comments and inputs from stakeholders and I&APs; (iii) the inclusion of inputs and recommendations from the specialist reports where relevant; and (iv) any information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested and affected parties; and	Appendix G1
(s)	where applicable, details of any financial provision for the rehabilitation, closure, and ongoing post decommissioning management of negative environmental impacts;	N/A
(t)	any specific information that may be required by the competent authority[1]; and	N/A
(u)	any other matters required in terms of section 24(4)(a) and (b) of the Act.	N/A
(2) Where a government notice *gazetted* by the Minister provides for the basic assessment process to be followed, the requirements as indicated in such a notice will apply		N/A

4 PUBLIC PARTICIPATION/STAKEHOLDER ENGAGEMENT PROCESS

The Public Participation Process (PPP) was conducted in accordance with **Chapter 6 of the Environmental Impact Assessment Regulations, Published in Government Notice R326 (as amended)**. In addition, the PPP was guided by the Integrated Environment Management Guidelines Series 7, Public Participation in the EIA process, published in Government Gazette no. 33308, 18 June 2010 **as well the approved PPP Plan from DFFE (attached in appendix E4).**

4.1 Purpose of Public Participation

The engagement of Interested and Affected Parties (I&AP's) and the Stakeholder Engagement Process is an important part of any environmental Impact assessment. The main objectives of the Stakeholder Engagement / Public Participation Process include amongst others:

- Informing the adjacent landowners, tenants, residents' associations, ward councillors, the local municipality and other organs of state of the proposed project;
- Establishing lines of communication between the stakeholders, I&AP's and the project team;
- Providing all parties with an opportunity to exchange information and to express their views and concerns regarding the proposed project;
- Obtaining comments/input from stakeholders and I&AP's, and ensuring that all views, issues, concerns and queries raised are fully documented; and
- Identifying all the significant issues associated with the proposed project

4.2 Public Participation Undertaken

In terms of the requirement of Chapter 6 of the EIA Regulations of December 2014, the following key public participation tasks are required to be undertaken:

- Fixing 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;
- Giving 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.
- Placing an advertisement in:
  - (i) one local newspaper; and

(ii) in at least one provincial newspaper.

- Open and maintain a register/ database of interested and affected parties and organs of state.

» Release of a Draft EIA Report for Public Review

» Preparation of a Comments and Responses Report which documents all of the comments received and responses from the project team.

In compliance with the requirements of Chapter 6 of the EIA Regulations, 2014, the following summarises the key public participation activities conducted to date.

4.2.1 **Stakeholder and land owner Identification**

Identification of I&APs was undertaken by Envirolution through existing contacts and databases, recording responses to site notices and the newspaper advertisement, as well as through the process of networking. The key stakeholder groups identified include authorities, local and district municipalities, public stakeholders, Parastatals and Non-Governmental Organisations (refer to **Table 3**).

Table 4: Key stakeholder groups identified during the EIA Process

Organisation	I&APs type	Designation	First Name Last Name
Department of Environment, Forestry & Fisheries		Biodiversity Directorate	Seoka Lekota
KZN Department of Economic Development, Tourism and Environmental Affairs.	Provincial Authority	EIA Coordinator:	Kacy Rengasamy
KZN Department of Economic Development, Tourism and Environmental Affairs (Zululand District Municipality)	Provincial Authority	Assistant Director: Environmental Impact Assessment Environmental Services	Sbusiso Ndwande
Ezemvelo KZN Wildlife	Provincial Authority	Conservation Planning	Nerissa Pillay/ Dinesree Thambu-Moodley
Department of Water & Sanitation (Pongola-Umzimkulu WMA)		Water Quality Management	Lwandle Sibango
Department of Water and Sanitation	Provincial Authority	Acting Deputy Director: Water Quality Management:	Mr Strini Govender.
Department of Agriculture, Forestry & Fisheries (DAFF)	Provincial Authority	Directorate: Forestry Regulations and Oversight	Wiseman Rozani Jeffrey Maivha Ayanda Mnyungula
KZN Department of Roads &Transport	Provincial Authority	Chief Director: TIRS: Ladysmith	Ms. B. Nogwanya
KZN Department of Roads &Transport	Provincial Authority	Manager : Road Infrastructure Develop & Management	Judy Reddy

KZN Department of Agriculture and Rural Development	Provincial Authority	Head of Department (personal assistant: Zakithi Mathenjwa)	Mr Siza Sibande
KZN Department of Cooperative Governance and Traditional Affairs	Provincial Authority	Head of Department	Mr T Tubane
KZN Department of Public Works	Provincial Authority		Xolile Ntanzi Meryl Naicker
KZN Provincial Heritage Authority (AMAFA)	Provincial Authority	Archaeology sites Impact Assessments Archaeology Permits	Bernadet Pawandiwa
KZN:COGTA (Zululand District)		DEPUTY DIRECTOR	
Zululand District Municipality	Local Authority	Development Planning Dept	Stefan Landman BP Mnguni
Zululand District Municipality	Local Authority	Municipal Manager:	SP Mosia
eDumbe Local Municipality	Local Authority	Municipal Manager	Mr MP Khathide
eDumbe Local Municipality	Local Authority	Mayor's Office Manager: PA Bandile	Ms Z Msibi
eDumbe Local Municipality	Local Authority	Office of speaker: PA Thando	
eDumbe Local Municipality	Local Authority	Director Planning & Development	Mr Shaka Cele
eDumbe Local Municipality	Local Authority	Environmental Manager	Lungi Nokulunga Radebe
eDumbe Local Municipality	Local Authority	Ward 3 Cllr	Cllr Sharon Thembisile Hlatshwayo
eDumbe Local Municipality	Local Authority	PR Councillor	Ronald Christoph Gevers

4.2.2 **Stakeholder Database**

An I&AP's register was opened and maintained in terms of Regulation 42 and contains the names, contact details and addresses of:

i. 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;
ii. all persons who have requested the proponent or applicant, in writing, for their names to be placed on the register; and
iii. all organs of state which have jurisdiction in respect of the activity to which the application relates.

All relevant stakeholder and I&AP information has been recorded within a database of affected parties (refer to **Appendix E8**). While I&APs were encouraged to register their interest in the project from the onset of the process undertaken by Envirolution Consulting, the identification and registration of I&APs has been on-going for the duration of the BA process.

4.2.3 **Placement of Site Notices & Newspaper advertisement**

Site notices will be displayed in different points within the study area. Newspaper advertisement will be placed in *local newspaper requesting* Interested and Affected Parties (I&APs) to register, and submit their comments.

Proof is included in **Appendix E1 & E2**

4.2.4 **Written notifications**

A Background Information Document was produced and distributed during the initial PPP phase in March 2021 in the form of an email distribution to registered I&APs prior to the release of the Draft Report for review.

These are all included in **Appendix E2.**

4.2.5 **Public Review of the Draft Basic Assessment Report**

i. Stakeholder:
English and isiZulu Adverts was placed in the local Newspapers notifying registered IAPs of the availability of the draft BAR. The draft BA Report was publicly made available to all registered I&AP's from from **21 August 2023 to 21 August 2023** at the following place:

- **Paulpietersburg Library**
- **Dropbox** link sent to registered I&APs via email
- **Email** copy of the BAR document (without appendices) sent to registered I&APs via email

ii. Authority: The Draft BA Report was sent to (amongst others):
- Department of Forestry, Fisheries and Environment (Biodiversity Directorate).
- KZN Department of Economic Development, Tourism and Environmental Affairs
- Department of Water and Sanitation
- Ezemvelo KZN Wildlife

- Zululand District Municipality
- eDumbe Local Municipality

4.2.6 **Public consultation**

In order to provide information regarding the proposed project and the BA process, a background information document (BID) for the project was compiled at the outset of the process. In order to accommodate the varying needs of stakeholders and I&APs within the study area, as well as capture their views, issues and concerns regarding the project, various opportunities will be provided in order for I&APs to have their issues noted. I&APs will be consulted through the following means:

- Written, faxed or e-mail correspondence
- Virtual meetings,
- One-on-one Telephonic consultation with directly affected or surrounding landowners;
- Focus Group Meetings will be held with different parties (i.e. landowner, local municipalities etc..) with limited number of participants in order to adhere to the current Level 1 Covid-19 safely measures.

Any minutes of meeting held will be captured within **Appendix E6**.

4.2.7 **Comments and Responses Report**

At the end of the announcement phase, all comments/input from stakeholders and I&AP's, will be captured in the Issues and Response Report (IRR) which formed part of the Final BA Report. The Comments and Response Report includes responses from members of the EIA project team and/or the project proponent. This is included in **Appendix E7.**

4.3 Summary of Issues Raised by I&AP's

Issues and concerns raised by I&AP's have been integrated into the Issues and Responses Report. The issues and concerns were raised by means of:

- issues raised during open day meeting and focus group meetings;
- written submissions in response to advertisements
- telephonic communications with I&AP's;
- issues raised through written correspondence received from I&AP's (fax, email and mail).

4.4 Summary of Issues Raised by I&AP's

Issues raised during the previous EIA Process: A draft Basic Assessment Report (DBAR) was **first released for public review in June 2021** for a 30-day public review period., Ezemvelo Wildflife raised the following Issues & concerns on the application:

1. **Correspondence dated 12 August 2021**: The DBAR have failed to adequately address both the direct impacts and/or residual impacts to this threatened vegetation type (i.e., no mitigation and/or offset has been proposed to address the direct/residual impact).
2. Conclusion and Way Forward The applications as currently proposed have the potential to (1) have severe impacts on important biodiversity features, of particular concern is threatened vegetation, and thereby negatively impact upon the province's conservation goals and targets, and (2) foreclose upon opportunities for

securing critically important habitats for the purpose of biodiversity conservation. Given the above, it is strongly recommended that the DBAR be Rejected as:

i. the DBARs have failed to appropriately assess the significance of the abovementioned impacts, particularly from a cumulative impact point of view; and

ii. insufficient/no effort has been made to assess appropriate alternatives, for example the use of existing towers at the same location of the proposed tower.

5 DESCRIPTION OF THE AFFECTED ENVIRONMENT

This section provides a description of the environment that may be affected by the proposed project, as stipulated in the EIA Regulations (Appendix 3 Section (h) iv). The requirement is that the description of the footprint should focus on the Geographical, physical, biological, social, economic, heritage and cultural aspects. The environmental specialist studies that were undertaken to inform this section of the BA Report and have focussed on significant environmental issues of the project.

5.1 Land use and Landcover

Land use and Landcover:

The study area falls within the Paulpietersburg Moist Grassland vegetation type (National vegetation types from Vegetation map for South Africa, Lesotho and Swaziland (2018)) which consists of short grassland species, small trees and shrubs which is mostly concentrated along streams, rivers and mountain fissures. According to some sources, Paulpietersburg has the largest collection of grass orchids in South Africa which blooms in December. A relatively high biodiversity is often associated with the grassland vegetation types if it is in a pristine or undisturbed condition.

The study area is relatively transformed and fragmented with large tracts of land under plantations of exotic trees. Cattle farming and crop cultivation are another general land use. Most farms are used for grazing and is therefore characterised by the natural grassland vegetation. The proposed tower site is on top of the Dumbe Mountain which appears to be largely natural and undisturbed, with the exception of gravel tracks leading to the paragliding sites and the existing towers.

The R33 is a main transport route running through Paulpietersburg between the towns of Piet Retief and Vryheid. Paulpietersburg is considered a small, rural town, established in the late 19th century, with a population of approximately 1900 according to Wikipedia. It has a distinct German influence. Many people from German descend still lives in Paulpietersburg and farms in the region.

The existing town consists of two parts, namely the original town and the settlement of Dumbe to the north of the town centre. It is sustained by a commercial hub that provides opportunities for shopping, schooling, religious gatherings, and other services to the people in and around the town. Other rural settlements are located 10-15km to the east of Paulpietersburg and are nestled between the mountains.

Tourism is also part of the economy of the study area and offers a quaint town experience in a picturesque surrounding. The town is part of the Rainbow Route which connects Mpumalanga and Kwazulu Natal via a scenic meandering path through numerous small towns as well as cultural and heritage sites. Paragliding is an outdoor adventure sport that attracts adventurers to the Dumbe Mountain. The region also offers other outdoor activities such as fishing, scenic hikes and holiday destinations of which the hot springs at Natal Spa Resort is the most famous.

The Transnet railway line roughly follows the R33 and wraps around the town along its eastern boundary before continuing south. The Paulpietersburg Railway station is located west of the entrance to the main town centre.

The study area is considered rural, with agricultural activities dominating the land use. Forestry is the most visually prominent land use activity and occupies large areas in the western halve of the study area, interspersed with traditional agriculture such as cattle ranching and cultivation. The natural grassland vegetation is fragmented between the plantations and cultivated farms, although large, uninterrupted fields are still present towards the east and southeast. In general, the landscape provides picturesque views that is supported by interesting topographic variation, large expanses of green fields and a quaint town experience.

5.2 Biophysical Attributes/Features of the Study Area

Geographical features are man-made or naturally-created features of the Earth. Natural geographical features consist of landforms and ecosystems.

5.2.1 Climate

The Climate data was obtained from the national Land Type Survey (Turner et al, 1986). The climatic profile of the area can be described warm and temperate. The mean monthly rainfall is the highest in the month of January at 151.9 mm and lowest in the month of June at 9.3 mm of rainfall. About, 783.3 mm, or 86.94% of the annual average rainfall of 901 mm falls in the summer growing season (September to March).

5.2.2 Topography and Geology

The natural topography is considered varied, ranging between undulating hills and mountainous terrain. A general downward slope exists from the west towards the east. Rivers and streams create shallow depressions in the landscape, but deeper cuts are sometimes present along the foothills of the mountains (**Figure 6**).

The tower site is located on top of the Dumbe Mountain, with the town of Paulpietersburg nestled on the bottom of the northern foot slope. The Dumbe Mountain is considered a prominent topographic feature which creates a picturesque backdrop to the town of Paulpietersburg. The mountain, with its relatively flat top and easy access, provides exceptionally good opportunities for paragliding and is recognised as one of the best paragliding sites in Kwa-Zulu Natal. The attraction of sportsmen also creates tourism potential for the region.

Due to the elevated location of the site and the height of the proposed tower, it is expected to have a large area of potential impact. Very few screening possibilities exists but one can expect local screening factors such as trees and structures to limit visibility of the proposed tower in certain locations.

The topography is expected to provide a medium to low screening potential. According to the viewshed analysis (Figure 15), the areas that will experience most screening from the topography is towards the north and southeast. Areas approximately 4km from the tower position will experience partial screening to no screening. Large areas towards the north-east, north-west and southern parts of the study area (shown in red in Figure 4) will have a high potential for visual exposure, although the distance factor will greatly reduce the visual detection possibility.

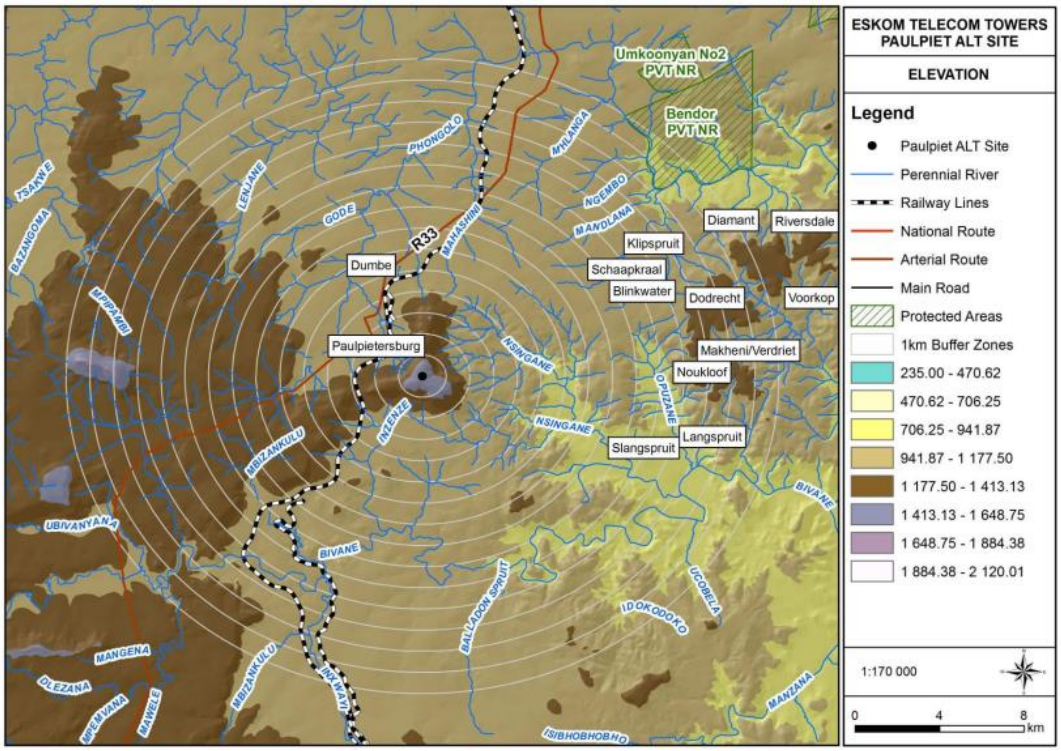

Figure 6: Regional elevation map

Large areas of the southern African continent are covered by the Karoo Supergroup (**Figures 7**). It covers older geological formations with an almost horizontal blanket. Several basins are present with the main basin in the central part of south Africa and several smaller basins towards Lebombo, Springbok Flats and Soutpansberg. An estimated age is 150 – 180 Ma. And a maximum thickness of 7000 m is reached in the south. Three formations overlie the Beaufort Group, they are the Molteno, Elliot and Clarens Formations. The Elliot Formation is also known as the Red Beds and the old Cave Sandstone is known as the Clarens Formation. At the top is the Drakensberg Basalt Formation with its pillow lavas, pyroclasts, etc. (Kent 1980, Snyman 1996). The Beaufort Group is underlain by the Ecca Group which lies on the Dwyka Group.

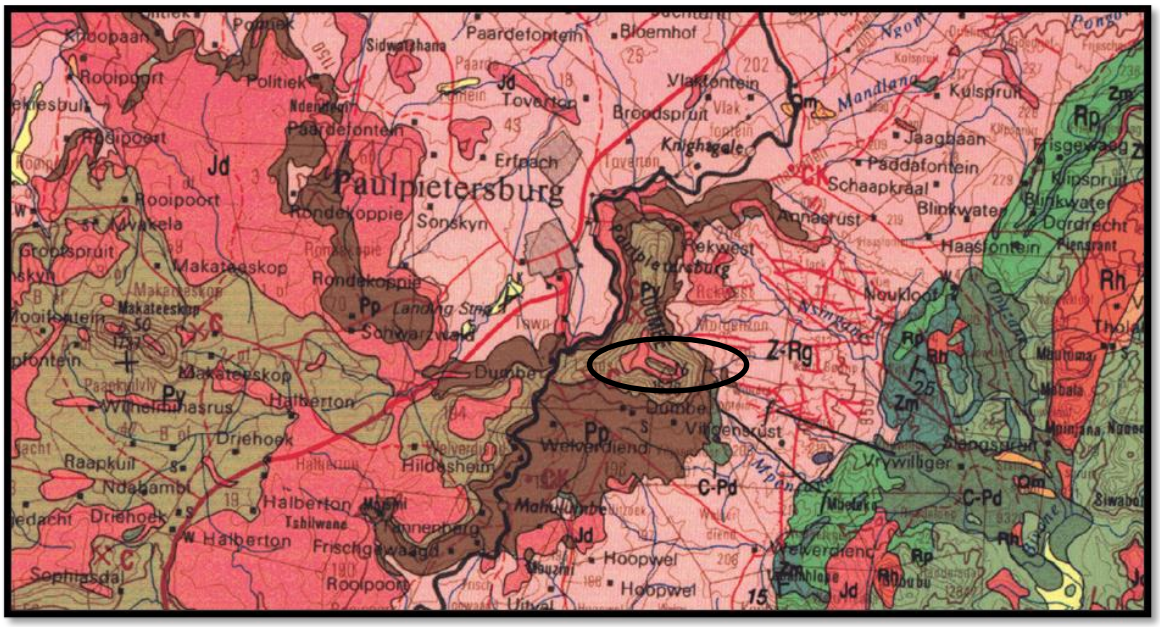

Figure 7:: Geological Setting of the study area

5.2.3 Soils

The project site falls under the land class type Ac114 which comprises of red and yellow dystrophic and / or mesotrophic soils. 20.2% of soils under the Ac114 soil classification can be classified as Rocks, while 14.4% can be classified as Mispah (Ms10), 18.6% as Farningham Hu17, Doveton Hu27 and 11.2% of soils under the Ac114 soil classification can be classified as Cartref Cf21, Cranbrook Cf22, etc. The soils have clay content varying between 6% and 55% with the average clay content of the site at 27.2%. The soil depth of the area varies between 100mm and 1200mm with the average depth of the site at 462.3mm.

5.3 Water Resources of the study area

5.3.1 Drainage and River Setting:

The tower site is located on a hilltop of eDumbe Mountain. According to the national quaternary catchment dataset, the site is located within catchment W41E that is drained by the perennial Bivane River (**Figure 8**). The tower site and eastern parts of the hilltop drain into a small tributary headwater mountain stream located 235m south-east of the tower. The Mhulumbela River is a right-bank tributary of the Phongolo River. The stream becomes the Nsingane River, which is a left-bank tributary of the Bivane River. The Bivane River is in turn a left-bank tributary of the Phongolo River.

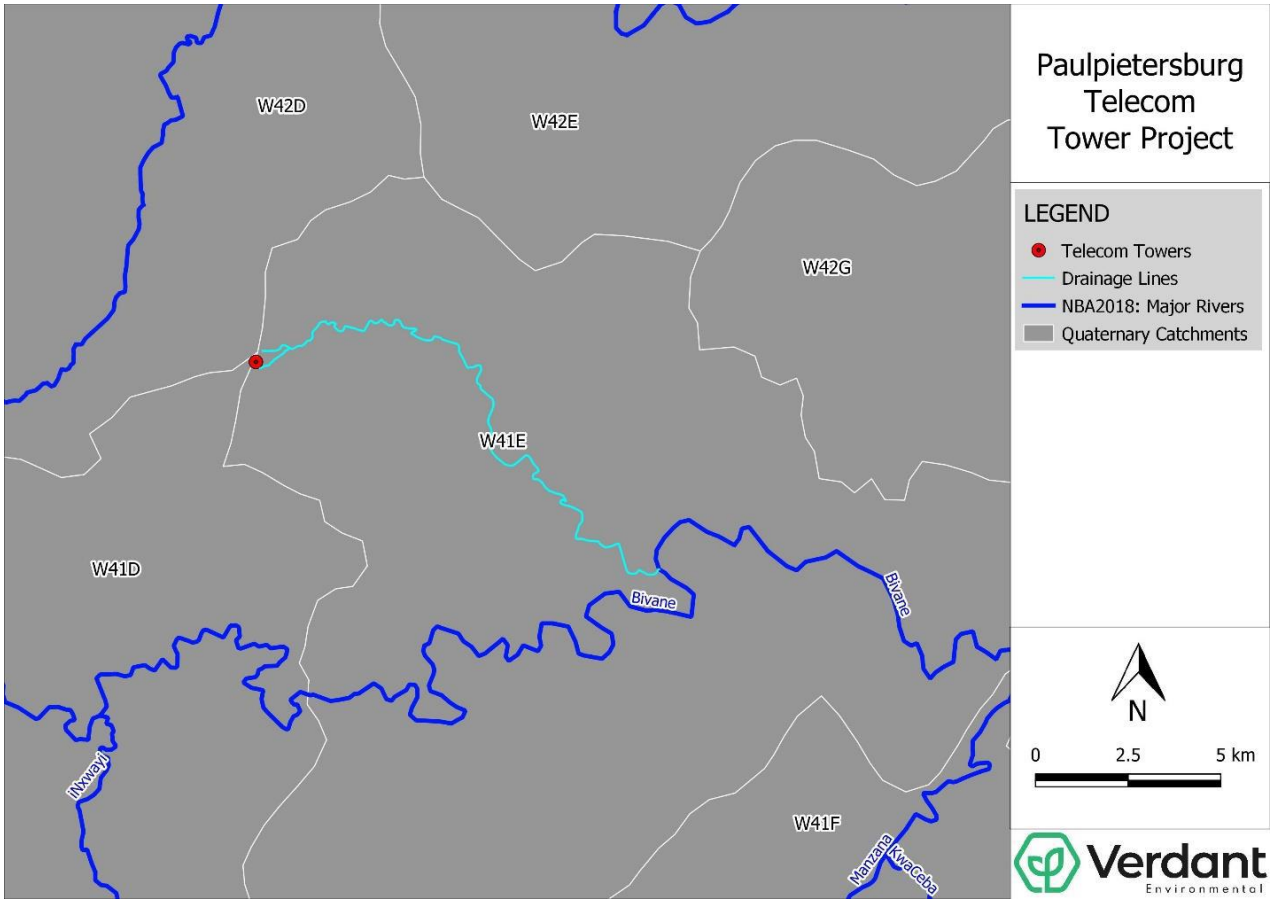

Figure 8:: Drainage setting of the study area.

5.3.2 National Wetland Mapping

All the potential watercourses occurring within 500m of the tower site were mapped as shown in **Figure 9.** A total of three watercourses were identified and mapped within 500m of the site. The proximity of the identified watercourses to the tower site is summarised as follows:

- The watercourse to the south-east of the site is located 200m downslope of the site.

- The watercourse to the north-east of the site is located 345m downslope of the site.
- The watercourse to the west of the site is located 375m of the site. The site does not drain in this direction.

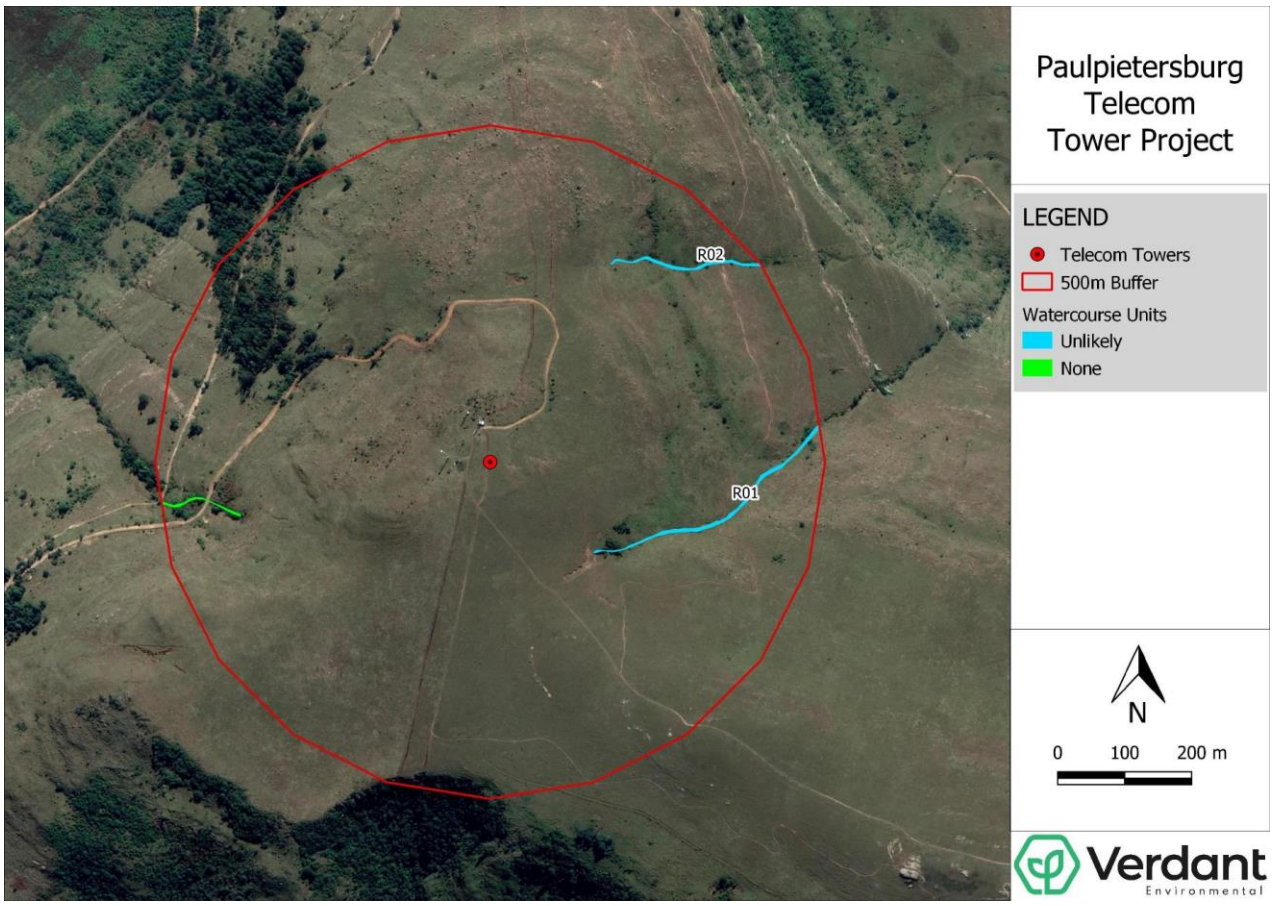

Figure 9: Watercourses within 500m of the project activities

5.4 Terrestrial Biodiversity

5.4.1 Vegetation Overview:

The vegetation is shown in National Vegetation Mapping (SANBI, 2018) as Paulpietersburg Moist Grassland (Mucina & Rutherford 2006, p. 403). It occurs in KwaZulu-Natal and Mpumalanga, including the: 'Broad surrounds of Piet Retief, Paulpietersburg and Vryheid, extending westwards to east of Wakkerstroom." It is described as: "Mainly undulating with moderately steep slopes, but valley basins are wide and flat and mountainous areas occur mostly along the northern and eastern boundary. Tall closed grassland rich in forbs and dominated by *Tristachya leucothrix*, *Themeda triandra* and *Hyparrhenia hirta*. Evergreen woody vegetation is characteristic on rocky outcrops." Paulpietersburg Moist Grassland is described as an Endangered vegetation type which is poorly protected and with the amount of endemism uncertain (Skowno et al. 2018).

5.4.2 Conservation Context

A summary of the conservation planning and threat status of the ecological features in the study area is provided in Table 5 below. Noteworthy features include:

- Paulpietersburg Moist Grassland is currently listed as **Endangered** in the NBA (SANBI, 2018).
- The sub-quaternary catchment within which the study area is located is classified as a **River Freshwater Ecosystem Priority Area (FEPA)** (CSIR, 2011).

• The site itself is not located within any Critical Biodiversity Area3, however, the surrounding grassland within 100m to the south and east is earmarked as **Critical Biodiversity Area: Optimal** and an **Ecological Support Area (ESA)** in the KZN Terrestrial Systematic Conservation Plan (EKZNW, 2015) (**Figure 10**).

Table 5:. Key conservation context details for the study area associated with Paulpietersberg Telecom Tower

NATIONAL LEVEL CONSERVATION PLANNING CONTEXT				
Conservation Planning Dataset		**Relevant Conservation Feature**	**Conservation Planning / Threat Status**	**Location in Relation to Project Site**
National Freshwater Ecosystem Priority Areas (NFEPA) (CSIR, 2011)	Rivers	Catchment Planning Unit 2359	River FEPA	Entire study area
2018 National Biodiversity Assessment (SANBI, 2018)	Terrestrial	Paulpietersburg Moist Grassland	Endangered	Entire study area
	Rivers	Bivane River	Least Threatened	±18km downstream
PROVINCIAL AND REGIONAL LEVEL CONSERVATION PLANNING CONTEXT				
Conservation Planning Dataset		**Relevant Conservation Feature**	**Conservation Planning Status**	**Location in Relation to Project Site**
Conservation Planning Dataset		**Relevant Conservation Feature**	**Conservation Planning / Threat Status**	**Location in Relation to Project Site**
KZN Aquatic Systematic Conservation Plan (EKZNW, 2007)		Planning Unit 877	Available	Entire project site
KZN Terrestrial Systematic Conservation Plan (EKZNW, 2015)		CBA: Optimal	CBA: Optimal	Within 100m of the study area

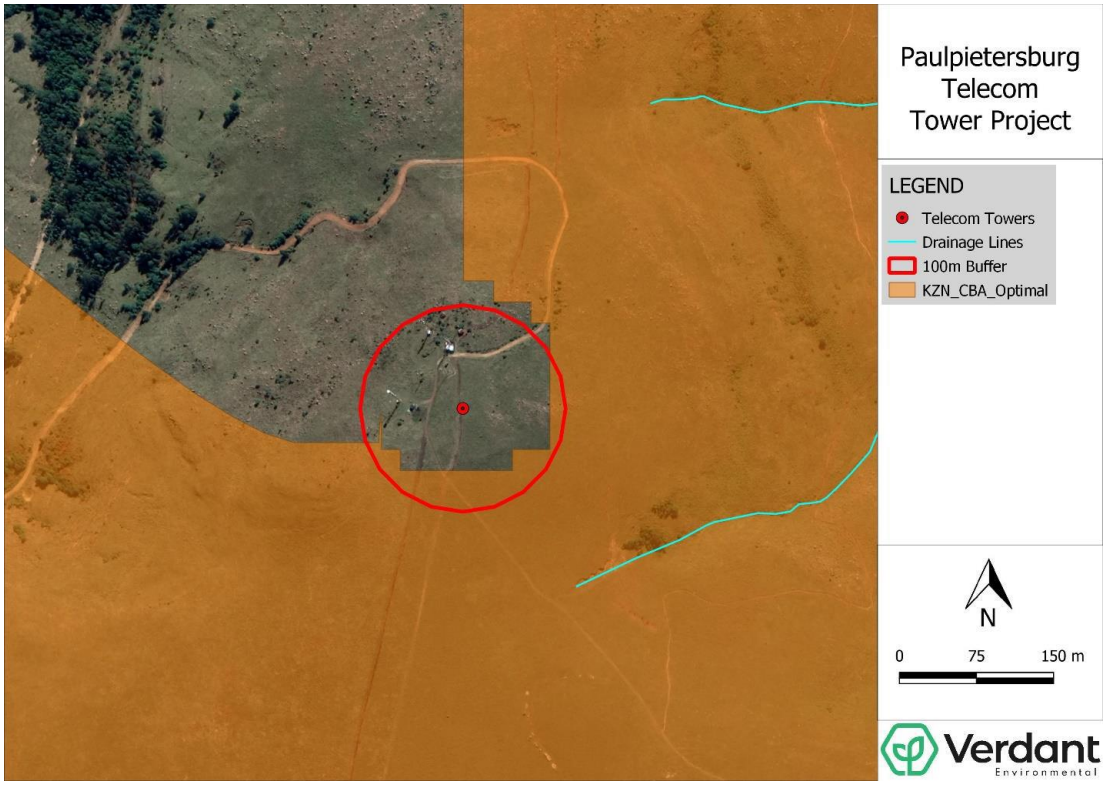

Figure 10:: KZN terrestrial systematic conservation plan (SCP) CBAs in relation to the study area.

5.4.3 Description of Vegetation communities

Infield observations confirmed that vegetation at the tower site and immediate surrounds comprises disturbed grassland that has lost much of its natural species richness. Moving outwards from the site there is a clear transition line from disturbed grassland to relatively undisturbed grassland that is more certainly primary and retains at least moderate richness. Disturbance appears to be the result of two factors, namely:

- • Physical disturbance to the grassland for the establishment and management of the other three tower sites on the hilltop, which shows that such tower projects can have measurable impacts on primary grassland despite their small footprint.
- • Overgrazing of the hilltop grassland resulting in a poor diversity of grass species.

An herbaceous species common above and below this transition line, indicating thin soils and rocky nature are *Tetraselago natalensis*. Other more common grassland species include *Senecio coronatus*, *Senecio latifolius* and *Thunbergia atriplicifolia*. Rock outcrops just below the line of transition host the woody shrubs *Cephalanthus natalensis* (Strawberry Bush) and *Searsia rigida*.

In addition, within 10 metres of the centre point of the disturbance footprint and in the more degraded grassland there are several examples of what may be *Moraea graminicola* subsp. *graminicola* (which was also observed in the better-quality grassland away from the footprint). This species "typically flowers early in the season, often before the first rains have fallen." Plants are also reportedly toxic to cattle and so will be little affected by grazing (Goldblatt 1986). *M. graminicola* subsp. *graminicola* is red listed as Near Threatened, and its persistence may also be because of its toxicity to livestock. However, the identity of these plants can only be confirmed when they flower, in spring.

The location and extent of the mapped vegetation communities and the red listed species within 100m of the tower site are shown in **Figure 11.**

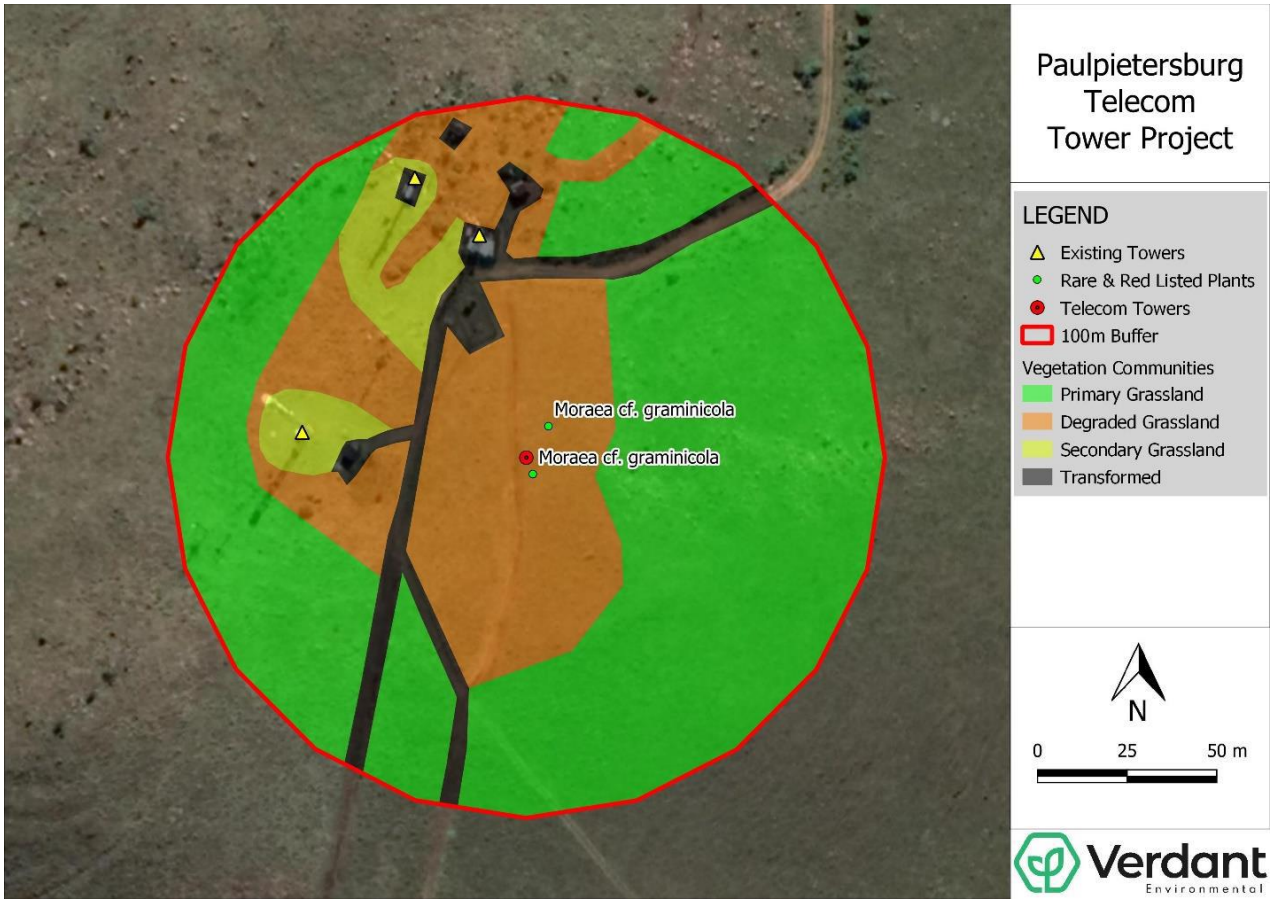

Figure 11: Vegetation communities and red listed plants within 100m of the tower site.

5.4.4 Rare, Threatened and Protected Species

Red Listed Species: Plants resembling *Moraea graminicola* subsp. *graminicola* were identified that are listed as Vulnerable. The populations at the sites are small (approximately 10 plants at each site) and there are a greater number outside any disturbance footprint. Furthermore, *Moraea* species are avoided by cattle, especially *Moraea graminicola* subsp. *graminicola*, and are likely to persist in spite of heavy grazing. The main reason for red listing appears to be habitat transformation, particularly commercial forestry and small-scale farming.

Orange Category Species: Although not seen, there is a good possibility of *Boophone disticha* occurring. This was not seen, but occurs in small numbers in many grasslands in eastern South Africa. It is likewise Declining, due to medicinal over-exploitation.

Protected Species: As all *Moraea species* are protected, if the footprint is to be developed, it is recommended at least that the small number of plants (estimated at less than 10) be relocated to grassland below, where they will not be disturbed. The corms of many *Moraea* species are deeply seated and the ground is rocky, therefore considerable care will be needed to excavate and replant without damage. Plants will also require initial watering. The relocation should only occur by a person with suitable horticultural experience, and in particular experience in relocating indigenous plants within natural habitats.

5.5 Fauna

5.5.1 Site Characteristics and Habitat Description:

The study area falls within the Grassland Biome. The site is located at the top of a hill and as such there is limited flat land and relatively steep slopes as distance increases from the centre of the site. The flat part of the site is largely dominated by degraded grassland whilst the slopes are dominated by rocky outcrops (**Figure 12**). A number of telecommunication masts are present onsite, further reducing suitable available habitat for terrestrial fauna. In terms of terrestrial fauna, only two main habitat units can be identified and are described as follows and presented in **Figure 13**:

- Degraded grassland: The majority of the study area is covered by degraded grassland. There is evidence that grassland areas at the site have been overgrazed, resulting in a poor diversity of grass species and thus reducing the potential of unit to provide habitat to faunal species.
- Rocky outcrop: The outlying areas of the site are dominated by rocky outcrops that offer a number of crevices for shelter of small faunal species.

Figure 12: Rocky habitat present at the Paulpietersberg site.

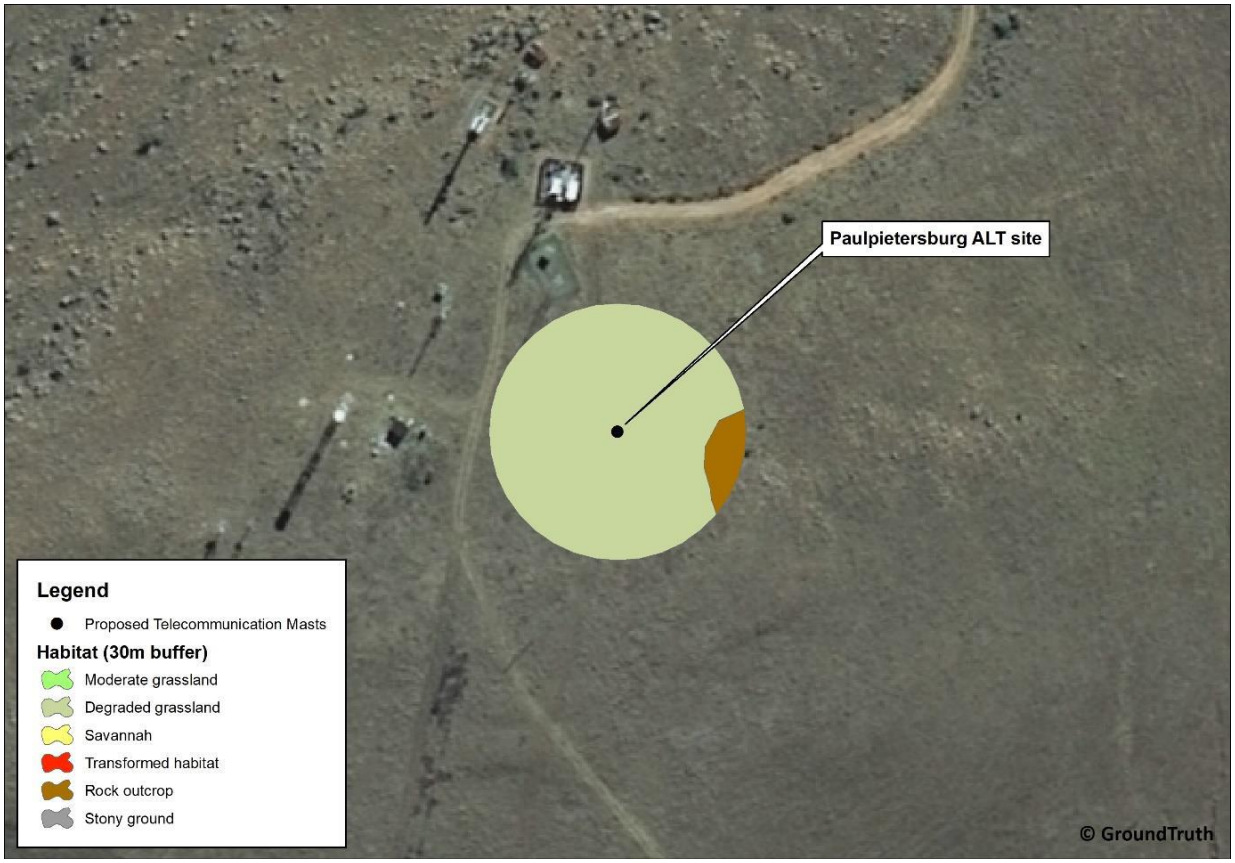

Figure 13: Habitat units associated with the site.

5.5.2 Mammals:

Of the 35 terrestrial mammals known to occur in the region, four are Red List species -one Endangered, one Near Threatened and two Vulnerable. None of these species, nor any evidence of these, were noted during the site visit. Each Red List species, their conservation status, and their likelihood of occurrence within the study area is presented in Table 6 of Appendix 2.

5.5.3 Reptiles

No reptile species were observed onsite; however, the site offers a large number of crevices that provide suitable habitat for reptile species. Only one of the species recorded in the region is a Red List species

5.5.4 Amphibians

A total of 18 amphibian species have been recorded in the region, all of which are classified as Least Concern (Appendix B). Amphibian species are highly dependent upon aquatic habitats, none of which are present in the study area. Although amphibians may potentially occur onsite, this is unlikely.

5.5.5 Invertebrate Diversity

Although an extensive invertebrate study was not undertaken at the site, it was noted that there was a moderate suite of invertebrates present onsite. Most invertebrates observed onsite were Orthoptera. No species of Diplopoda were observed, although suitable habitat is present for such species.

5.6 Avifauna

The planned location of the proposed Paulpietersburg tower (Paulpietersburg ALT RS) is on the summit plateau of a hill just southeast of Paulpietersburg town. The co-ordinates for the site are: -27.447489, 30.842200. It will be sited at an altitude of about 1530 m. The low-lying landscape surrounding the hill is at about 1100 m.

When this site was visited on 2 May 2023 it was found to be located within an existing 'tower farm' of five such structures (**Figures 14**). Four of these are lattice structures and one is a tubular monopole. Three of the four lattice structures have lateral support cables but one, and the monopole, do not. The surrounding habitat comprises open high-altitude natural grassland.

Figure 14: The existing[2] tower farm at the proposed Paulpietersburg site.

There is a powerline with wooden pylons routed to the tower farm from the west in **Figure 15**, the overhead lines of this powerline do not have any bird diverters/markers attached to them. Prior to examining the proposed Paulpietersburg tower site, another existing tower locality situated some 5 km to the southwest was visited. This site supports a single lattice tower and is without lateral support cables. It is serviced by a wooden pylon line without any bird markers.

[2] Note the lateral support cables attached to three of the lattice towers but not to the fourth lattice tower or to the monopole.

Figure 15: View of the powerline approaching the Paulpietersburg tower farm from the west.

Southern African Bird Atlas Project 2 information

Bird atlas data for the combined pentads 2725_3045 and 2725_3050 were extracted from the online resource of the Southern African Bird Atlas Project 2 (SABAP2, see: https://sabap2.birdmap.africa/). A pentad covers an area of 5 mins X 5 mins resolution, i.e. about 9 X 8 km. The proposed Paulpietersburg tower is located in pentad 2725_3050 but bird information was included from the adjacent pentad to the west (2725_3045) as the tower is close to the border with this latter pentad which also has a higher number of bird checklist cards (30 cards versus 15 cards) due to the town of Paulpietersburg lying within this pentad providing a larger and more reliable sample size relevant to the avifauna present. The borders of the two pentads relative to the proposed tower locality are shown in Figure 8. A total of 251 bird species have been recorded in the two pentads combined, from an amalgamated total of 45 cards, which is a reasonable level of coverage.

Red Data species

A total of 251 bird species has been recorded during SABAP2 in the two relevant pentads covering the proposed Paulpietersburg ALT RS tower. Twelve of these are Red Data species (Table 6).

Table 6[3]:. Details of the 12 Red Data bird species that have been recorded in the relevant two pentads during SABAP2 relative to the proposed Paulpietersburg ALT RS tower. Red Data status

Common name	Scientific name	Full protocol reporting rate (%)	Ad hoc reporting rate (%)	Red Data status nat./glob.
Blackcap, Bush	*Sylvia nigricapillus*	8.9	0.0	VU, VU
Buttonquail, Black-rumped	*Turnix nanus*	2.2	0.0	EN, LC
Crane, Grey Crowned	*Balearica regulorum*	8.9	0.0	EN, EN
Eagle, Crowned	*Stephanoaetus coronatus*	24.4	2.9	VU, NT
Eagle, Martial	*Polemaetus bellicosus*	2.2	2.9	EN, EN
Falcon, Lanner	*Falco biarmicus*	17.8	2.9	VU, LC
Harrier, African Marsh	*Circus ranivorus*	2.2	0.0	EN, LC
Hornbill, Southern-Ground	*Bucorvus leadbeateri*	0.0	2.9	EN, VU
Ibis, Southern Bald	*Geronticus calvus*	44.4	2.9	VU, VU
Kingfisher, Half-collared	*Alcedo semitorquata*	11.1	0.0	NT, LC

[3] Red Data status (nat. – national, glob. – global): CR = Critically Endangered, EN = Endangered, VU = Vulnerable, LC = Least concern.

Common name	Scientific name	Full protocol reporting rate (%)	Ad hoc reporting rate (%)	Red Data status nat./glob.
Secretarybird	*Sagittarius serpentarius*	8.9	0.0	VU, EN
Stork, Black	*Ciconia nigra*	6.7	2.9	VU, LC

Of these 12 Red Data species, nine are large birds that are vulnerable to collisions in flight with artificial structures, especially overhead cables. These species are: Grey Crowned Crane, Crowned and Martial eagles, Lanner Falcon, African Marsh Harrier, Southern Ground-Hornbill, Southern Bald Ibis, Secretarybird and Black Stork. It should be noted that no vulture species have been recorded in these pentads.

The reporting-rate information (Table 6), however, suggests that the following three species are rare in this area and likely only vagrants (reporting rates less than 5%): Martial Eagle, African Marsh Harrier and Southern Ground-Hornbill. Three species show particularly high reporting rates (18-44%) and are thus relatively common in these pentads: Southern Bald Ibis, Crowned Eagle and Lanner Falcon.

5.7 Cultural Heritage Aspects of the area Palaeontology of the area

5.7.1 Heritage Aspect

- **Stone Age period:** Over time the amount of exchange items seems to decline, as is evidenced form the material recovered from the various shelters that Mazel excavated. This is seen as symptomatic of a society beginning to experience a greater level of stability, where they need not to invest so heavily in servicing extended social relations. However, a parallel increase and intensifying in ritual activity can also be seen during this time.
- **Iron Age period:** The Hluhluwe area was originally a royal hunting ground for the Zulu kingdom, but was established as a park in 1895. The Umfolozi and Hluhluwe reserves were established primarily to protect the white rhinoceros, then on the endangered species list.
- **Historic period:** After the annexation of Natalia by the British in 1843, many of these early white settlers left the area and moved onto the central plateau area to settle in what was to become the Orange Free State Republic and the South African Republic (ZAR). Rev. Aldrin Grout started the Inkanyeza Mission in April 1841. This first white settlement in the area was abandoned during tribal hostilities fifteen months later. White settlers returned in 1851 when the Norwegian mission was established and by 1894 the lower Umfolozi Magistry was established in Empangeni which was becoming an active trading centre.
- **Site specific review**: The area in which the development of the RS towers will take place can be described as a very slowly evolving farming landscape. Change that was brought about was an expansion from grazing to larger agricultural fields. Over time, the number of built features, mostly homesteads, expanded into small villages. Old maps and aerial photographs indicate that the site where the tower is to be constructed was always vacant and used as agricultural fields. This would effectively have destroyed much of any archaeological remains that might have occurred here in the past.

5.7.2 Palaeontological overview of the area:

The Ecca Group, Vryheid Formation may contain fossils of diverse non-marine trace, *Glossopteris* flora, mesosaurid reptiles, palaeoniscid fish, marine invertebrates, insects, and crustaceans (Johnson 2009). *Glossopteris* trees rapidly colonised the large deltas along the northern margin of the Karoo Sea. Dead vegetation accumulated faster than it could decay, and thick accumulations of peat formed, which were ultimately converted to coal. It is only in the northern part of the Karoo Basin that the glossopterids and cordaitales, ferns, clubmosses and horsetails thrived (McCarthy and Rubidge 2005).

The Glossopteris flora is thought to have been the major contributor to the coal beds of the Ecca. These are found in Karoo-age rocks across Africa, South America, Antarctica, Australia and India. This was one of the early clues to the theory of a former unified Gondwana landmass (Norman and Whitfield 2006).

Fossils are generally absent from the Pietermaritzburg Formation although trace fossils have been recorded from the upper layers (AMAFA Palaeotech).

Trace fossils are relatively abundant in the shales occurring near the top of the Dwyka Group. Lycopods (*Leptophloem australe*) have been described from the northern Free State (Mac Rae 1999). Spores and acritarchs have been reported from the interglacial mudrocks of the Dwyka Group, also pollen, wood, and plant remain in the interbedded mudrocks as well as the diamictite itself, while anthropod trackways and fish trails are present in places on bedding planes (Visser *et al.* 1990).

Fossils in South Africa mainly occur in rocks of sedimentary nature and not in rocks from igneous or metamorphic nature. Therefore, if there is the presence of Karoo Supergroup strata the palaeontological sensitivity is generally **LOW** to **VERY HIGH**.

5.8 Visual Characteristics of the area

5.8.1 Sense of Place

The sense of place is largely dictated by the predominantly agricultural land use and rolling hills covered in the natural grasslands. Plantations contribute most to the character of the western half of the study area, while open grasslands and low intensity farming is mostly present towards the east. Town and settlement developments are unpretentious, nestled between the mountains. Large areas are still considered natural, and views of high scenic quality are experienced in the study area. Panoramic views with distant mountains greet observers while travelling through the study area.

5.8.2 Study Area Photographic Record

As shown in **Figure 14**

- Panoramic view (1): This photo is taken from the R33 approaching Paulpietersburg from the south western side. The photo location is approximately 7.8km from the tower site and is at a digital zoom factor of 2.2x. The existing towers are located at the green arrow. In actuality the towers are more pronounced when viewed with the naked eye. At this distance, the towers are detectible, but its influence on the scene is minimal due to the diminishing visibility over the distance;
- Panoramic view (2): This photo is representative of the views from the Dumbe settlement at 4.5km from the tower site. The prominent structures in the foreground do take preference in this scene, but the towers are detectible on the Dumbe Mountain in the background;
- Panoramic view (3): This view is taken from within Paulpietersburg's residential area and illustrates a partial scene of the Dumbe Mountain. Garden vegetation and houses are responsible for blocking views towards the tower site. In this case, an opening in the vegetation provides a line-of-sight to the location of the proposed tower; and
- Panoramic view (4): This panoramic photo was taken from 5.2km to the south east of the tower site along the road to Louwsburg. It is representative of the study area to the east of the tower site. At this location on the top of the tower will be noticeable and although detectible, will have a negligible visual change to the scene.

Panoramic view (1) Panoramic view (2)

Panoramic view (3) Panoramic view (4)

Figure 16: Study Area Photographic Records

5.8.3 Viewshed Analysis

Several views were assessed during the site investigation as illustrated in Figure14. In addition, visibility mapping through a Geographical Information System (GIS) software is also done to determine a preliminary Zone of Visual Influence (ZVI). The mapping indicates the extent of the potential ZVI based on the topography alone, thereby not considering the screening effect of vegetation. It calculates a cumulative viewshed for a series of points stacked at 10m vertical intervals, on the tower location. It presents a coloured map where red indicates the areas that could Project experience a full view of the entire tower. The colours change as the tower is partially screened, usually from the bottom up. Only the top is visible from the green areas (**Figure 17**).

The conclusion is that the study area provides a low degree of screening in certain locations if only the topography is considered. However, the landcover, for example plantations and other natural or anthropogenic features, do provide an additional screening capacity in specific locations. This raises the general degree of screening to medium/high.

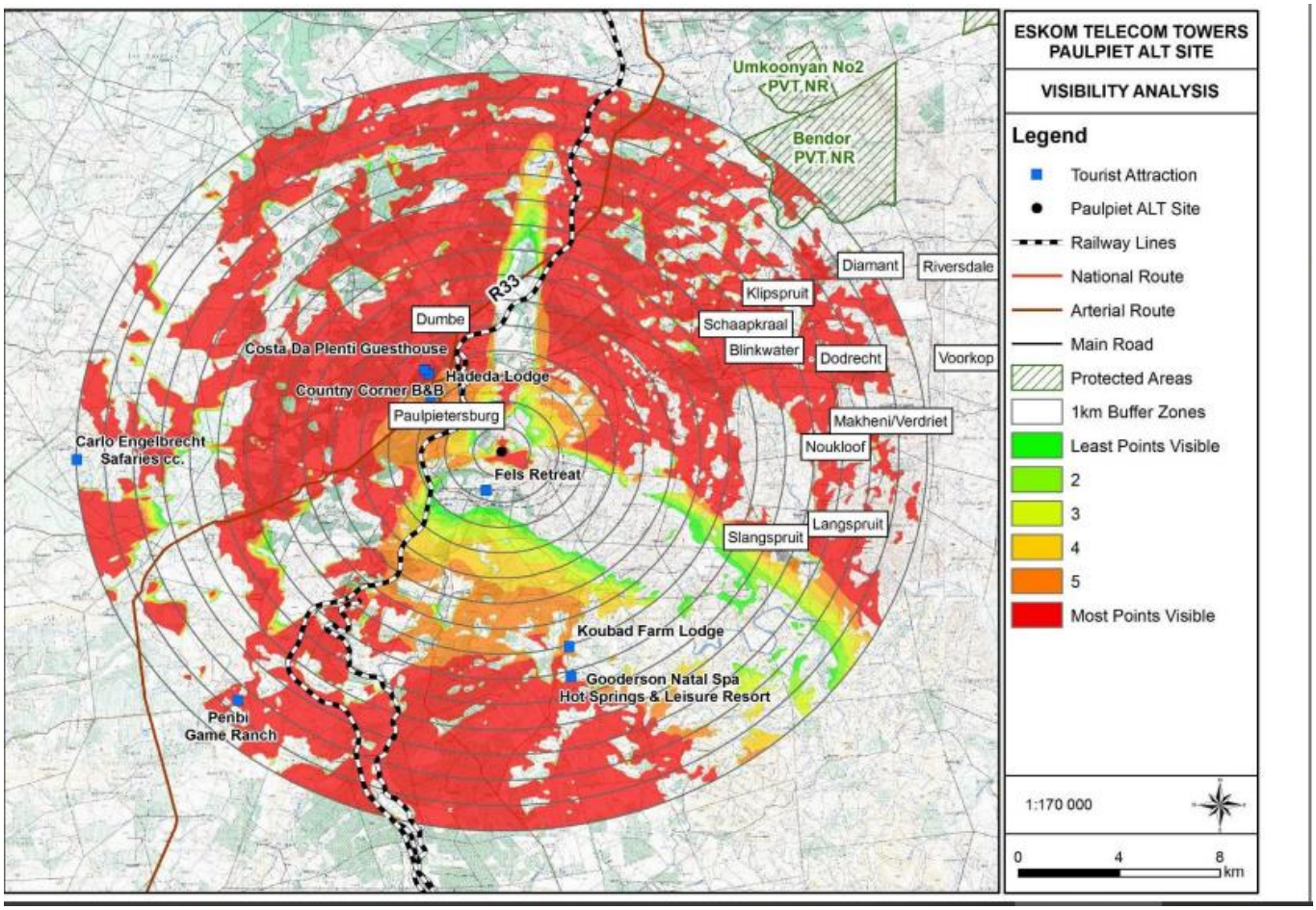

Figure 17:: Cumulative viewshed map

5.9 Social Characteristics of the Study Area and Surrounds

Demographics:

The population of eDumbe Municipality was recorded at 89 614 people in 2016 compared to a total of 82 053 in 2011. This is evidence of an increase of 7 561 people between 2011 and 2016. This increase can be attributed by a number of factors such as immigration by residents moving from other neighbouring areas to eDumbe in search for better opportunities and standard of living, or/and an increased housing development. The age structure of eDumbe on the population pyramid (see figure 9) reveals a children population profile with 41.3% of the population under the age of 14 years of age and 52.2% being of working age, and with only a 6.2% of the elderly population. eDumbe population consists of more females than males, the females account for 53,1% of the population and male population only account for about 46,9%. This is assumed to be related to males who migrate to seek employment opportunities outside the municipal boundaries, which has translated to 52.1% of the households being female-headed.

Employment

The level of unemployment is estimated at approximately 37, 7%. Below a moderate percentage, a proportion of 45.4 % of this youthful population is unemployed. Approximately 18, 3% of them have no schooling and only 22.1 % have reached Matric level, yet 4% have higher education, i.e. 20+ of age. The total number of households in eDumbe is 16 138, and 8 206 are agricultural in practise. 74% of the dwellings are formal, 62.6% are owned/paid off, yet only 5.5 % have flush toilet connected to sewerage, and 13.8% are piped with water inside dwelling. 62.8% DUs have electricity for lightning.

Economy

The Gross Domestic Product (GDP) of eDumbe Municipal Area is estimated R 1 261 941 000 which accounts to 10% of the Zululand District GDP. The GDP of both eDumbe and Zululand District are quite small when a comparison is made with the rest of the areas within KwaZulu-Natal. In fact, the provincial GDP is estimated at approximately R 420 647 000 000 while Zululand District is said to account for only 3% (R 12 619 410 000) of that GDP. This implies that the size of the local economy is very small.

The agricultural sector is the major employer and eDumbe's economy is far more heavily reliant on agriculture than both Zululand and KZN. This is the major economic activity in the study area, due to availability of good quality agricultural land, however the heavy reliance on agriculture represents a relatively underdeveloped economy that requires further diversification and development of the secondary sector.

infrastructure

With regards to water and sanitation provision in eDumbe area, the Municipality is playing a coordination role whilst the Zululand District Municipality is a Water Service Authority. In striving to provide water and sanitation to the municipalities effective and adequately, Zululand District Municipality has developed the Waters Services Development Plan (WSDP) which is reviewed annually.

Provision of electricity within the eDumbe municipal area is sourced from 6 substations. Service delivery in eDumbe municipality remains a challenge and levels of delivery differ greatly by ward with many households especially in the townships and tribal areas having low levels of access to electricity. Some rural areas are still dependent on wood as a source of energy. Eskom is playing a major role in assisting the local community with regards to rural electrification. The main reason for such areas no to be electrified is the dispersed nature of settlements, which makes provision economically unviable. The Municipality and Eskom have a distribution license issued by the National Electricity Regulator of South Africa (NERSA).

20,7% of households have access to decent refuse removal, 65,1% use their own yards to dispose refuse. An external service provider has been contracted by the Municipality to collect refuse on a daily basis from the Paulpietersburg CBD, taxi rank, Dumbe Township and Bilanyoni twice a week respectively.

The municipality's IDP indicates the generally low levels of education of residents over 20 years old that exist in eDumbe. Seventeen percent of the population has no schooling at all; 5% have a matric and only 1.5% possesses any sort of higher education. These averages are generally in line or tend to be slightly better than for the district municipality; however, they lag behind provincial averages. eDumbe LM currently has 123 schools, 30 of these are creches (both formal and informal), 72 primary schools and 17 secondary schools, and 13 Combined school. The 2018/19 IDP has proposed 39 Early Childhood Development Centres (ECD).

Source: 2017-2040 edumbe Spatial Development Framework

6 DESCRIPTION OF POTENTIAL IMPACTS AND ISSUES

The activities that are associated with the construction, maintenance and operation of the proposed Towers, which could potentially have an impact on the environment, are also highlighted in this section. In addition, the Department of Environmental Affairs guide on assessing cumulative effects[4] describes that it is not practical to analyse the cumulative effects of an action on every environmental receptor. Therefore, for cumulative effects analysis to help the decision-maker and inform interested and affected parties, it must be limited to effects that can be evaluated meaningfully. This chapter will highlight potential impacts and issues that can be evaluated.

6.1 Aquatic and Wetland impacts

Potential impacts and the relative significance of the impacts are summarised below (refer to **Appendix E1** – Aquatic and Wetland Impact Assessment Report for more details).

6.1.1 Results of the Wetlands Assessment:

Desktop Mapping within 500m and Confirmation of the Study Area

All the potential watercourses occurring within 500m of the tower site were mapped as shown in **Figure 18**. A total of three watercourses were identified and mapped within 500m of the site. The proximity of the identified watercourses to the tower site is summarised as follows:

- • The watercourse to the south-east of the site is located 200m downslope of the site.
- • The watercourse to the north-east of the site is located 345m downslope of the site.
- • The watercourse to the west of the site is located 375m of the site. The site does not drain in this direction.

Considering the large distance between the tower site and the three watercourses and the very small impact footprint of the tower project, the likelihood of impact ratings for each of the watercourses were screened as follows:

- • The watercourse to the south-east – **unlikely**.
- • The watercourse to the north-east – **unlikely**.
- • The watercourse to the west – none.

This means that the project stands to have no measurable impacts on the local watercourses. For this reason, the assessment approach was to undertake site visits to confirm and verify the location of the watercourses and the above impact screening results. Formal delineation and PES, ecosystem services and EIS assessments were not undertaken.

[4] *DEAT (2004) Cumulative Effects Assessment, Integrated Environmental Management, Information Series 7, Department of Environmental Affairs and Tourism (DEAT), Pretoria*.

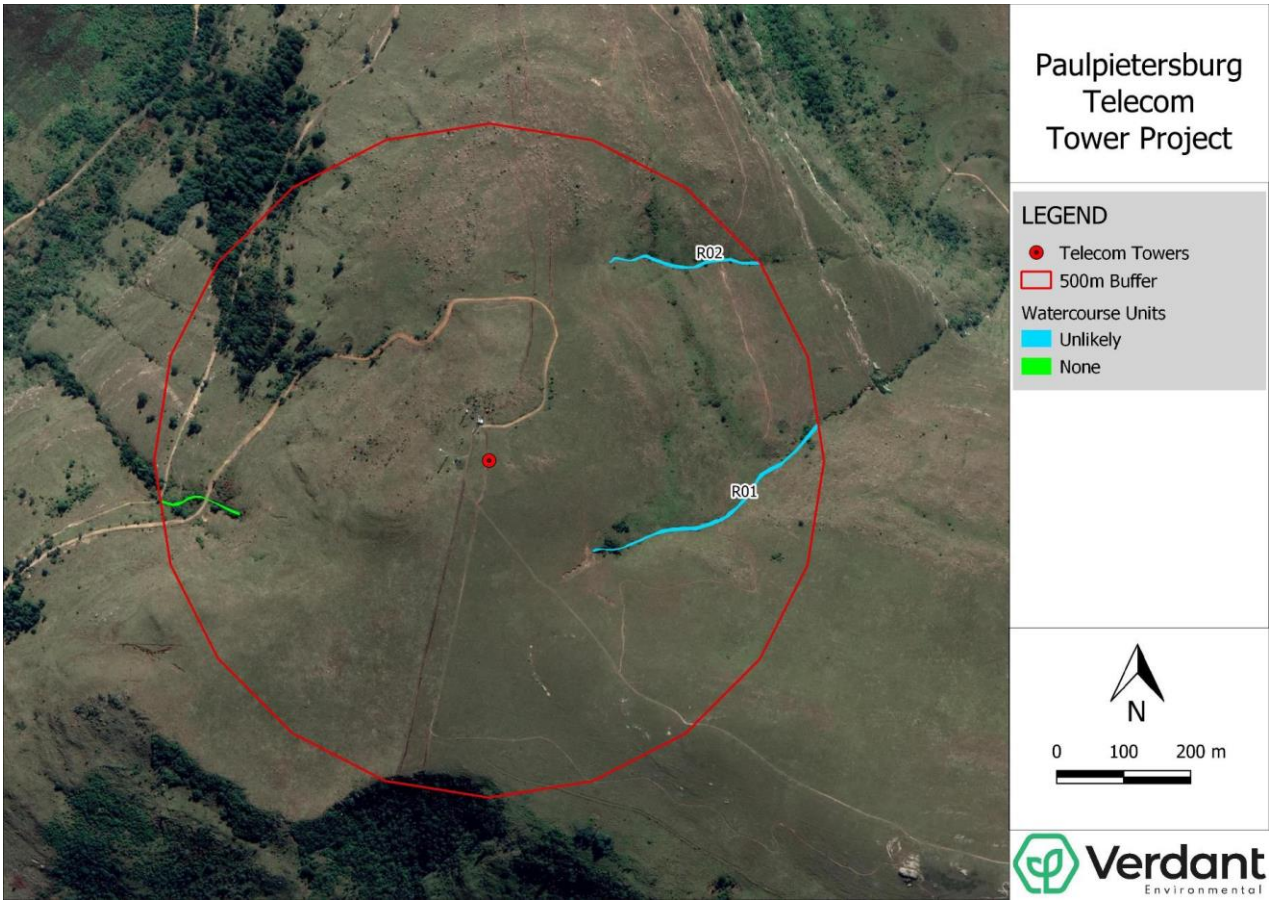

Figure 18:: Watercourses within 500m of the project activities with an indication of the likelihood of impact

6.1.2 Description **of Impacts:** The watercourses within 500m of the project are unlikely to be impacted. Therefore, the risk will be negligible. Nevertheless, in line with the requirements of the Department of Water and Sanitation (DWS), a risk assessment has been done to formally confirm the low risk status of the project**.**

Considering the negligible to likely non-existent impacts, it is debatable whether the project activities even constitute a Section 21(c) and 21(i) water use. This will need to be confirmed with the DWS. If the project activities are considered a water use, A General Authorisation will be applicable.

6.2 Vegetation impacts summary

6.2.1 Results of the Vegetation Study:

The disturbed grassland within the study area has lost much of its natural species richness and is only partially representative of the endangered Paulpietersburg Moist Grassland. This community also hosts red data plant species. This vegetation community is thus considered of moderate importance and sensitivity. The primary grassland areas are rated as being of high importance and sensitivity being characterised by high forb richness, being a good example of an endangered vegetation type and being classified as a CBA. The rest of the units are of low importance. The sensitivity mapping for the site is shown in **Figure 19**.

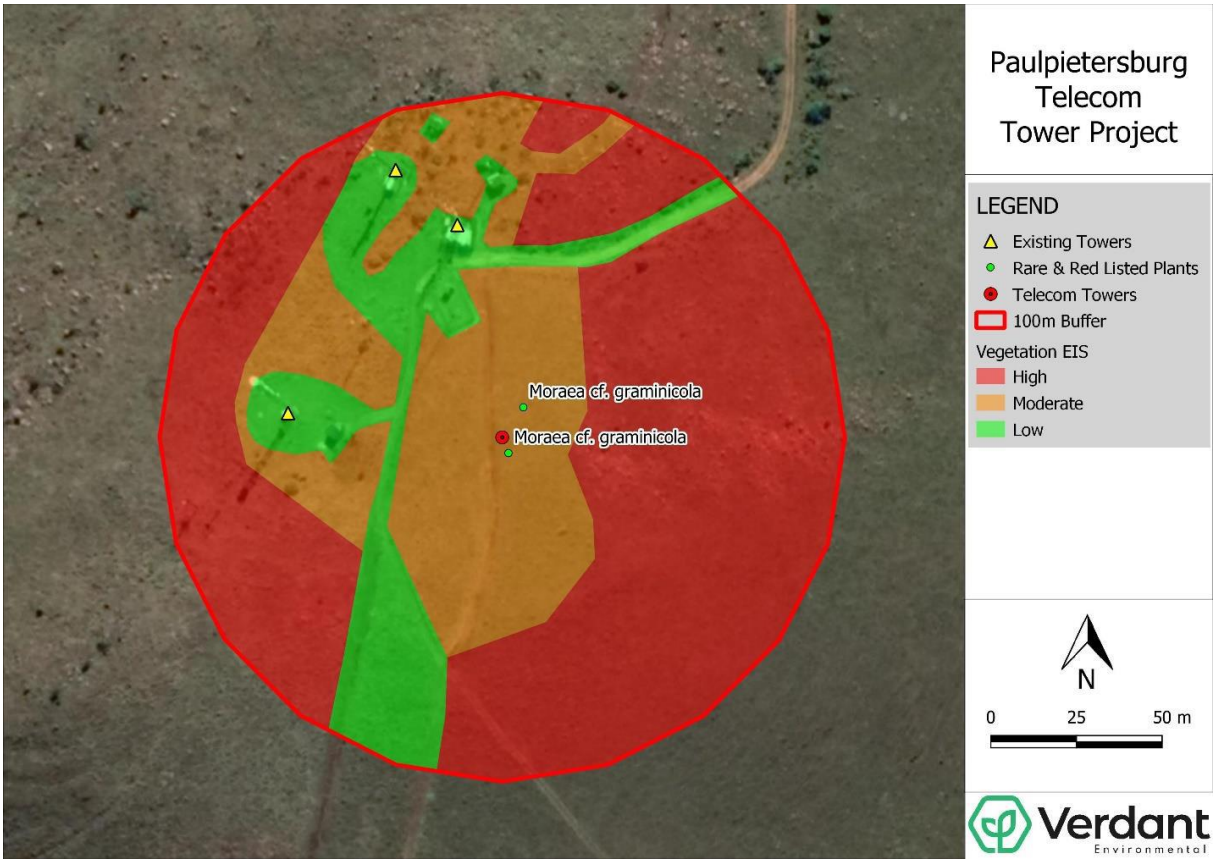

Figure 19: EIS ratings for the vegetation communities within 100m of the tower site.

6.2.2 Description of Ecological Impact

For the purposes of this assessment, the potential impacts to the terrestrial flora and local terrestrial biodiversity resulting from the proposed activities can be grouped into the following impact categories:

- **Direct ecosystem destruction and modification impacts** – This impact refers to the direct physical destruction and/or modification of terrestrial vegetation communities and habitat during the construction and operational phases of the project and incudes habitat loss impacts, biota fatalities and population reductions, habitat fragmentation, habitat patch size reduction, and the occurrence of barriers to propagule and animal movement.
- **Indirect ecosystem disturbance impacts** – This impact refers to the indirect impacts to the biota and vegetation communities as a result of activities within close proximity that result in the following impacts: (i) alteration of abiotic soil and moisture conditions, (ii) increased rates of erosion and sedimentation, (iii) alteration of the chemical and biological characteristics of soil and water, (iv) increased alien invasive plant invasion, (v) noise pollution, (v) vibrations and (vi) light pollution, and (vii) expanded edge effect.

6.3 Fauna

6.3.1 Results of the Fauna Study

Based on onsite observations, as well as a desktop analysis, each of the habitat units were assigned to an importance and sensitivity class as detailed below and presented in **Figure 20:**

- Degraded grassland: **Medium** sensitivity.

- Rocky outcrop: **Medium** sensitivity

Figure 20: Habitat sensitivity, based on faunal sensitivity, at the site

6.3.2 Description of Faunal Impacts

This impact refers to the direct physical destruction and/or modification of terrestrial vegetation communities and habitat during the construction and operational phases of the project and incudes habitat loss impacts, biota fatalities and population reductions, habitat fragmentation, habitat patch size reduction, and the occurrence of barriers to propagule and animal movement.

- Direct ecosystem destruction and modification impacts: This impact refers to the direct physical destruction and/or modification of terrestrial vegetation communities and habitat during the construction and operational phases of the project and incudes habitat loss impacts, biota fatalities and population reductions, habitat fragmentation, habitat patch size reduction, and the occurrence of barriers to propagule and animal movement.
- Indirect ecosystem disturbance impacts – This impact refers to the indirect impacts to the biota and vegetation communities as a result of activities within close proximity that result in the following impacts: (i) alteration of abiotic soil and moisture conditions, (ii) increased rates of erosion and sedimentation, (iii) alteration of the chemical and biological characteristics of soil and water, (iv) increased alien invasive plant invasion, (v) noise pollution, (v) vibrations and (vi) light pollution, and (vii) expanded edge effect.

6.4 Avifauna

6.4.1 Results of the Avifaunal Study

During the field visit to this site on 2 May 2023 an adult Jackal Buzzard (a non-threatened bird of prey vulnerable to collisions with elevated structures) was recorded close to the existing tower farm at the proposed tower site (**Figure 21**).

Figure 21: An adult Jackal Buzzard recorded close to the proposed Paulpietersburg ALT RS tower

The lower slopes of the hilltop supporting the existing tower farm and the proposed telecommunications tower have tall cliff faces suitable for nesting and roosting by relevant Red Data species. In particular, a stretch of cliffs in the southwest part of this hill had cliff faces heavily stained with bird droppings likely from roosting/nesting Southern Bald Ibises (Figure 22). These cliffs also appeared eminently suitable for breeding by Lanner Falcons. Both of these birds are Red Data species. These observations suggest potential danger to these species from collisions with existing and proposed towers at this site.

Figure 22: Cliff faces on the lower southwestern slopes of the hill supporting the existing tower farm and proposed Paulpietersburg ALT RS tower

6.4.2 Description of Avifaunal Impacts:

The potential threat to birds stemming from collisions with telecommunication-tower infrastructure lies within the broader problem of bird collisions with elevated anthropogenic structures generally (Kerlinger 2000, Anderson 2003, Erickson et al. 2005). This issue has achieved greatest prominence relevant to collisions with overhead electricity power transmission and distribution lines (Bernardino et al. 2018) and, more recently, with the blades of wind turbines (Drewitt & Langston 2008). The problem however extends to elevated structures generally, e.g. cables associated with telephone lines, cable-cars, ski-lifts, zip-lines, fence-lines, etc., and buildings, particularly those with bright night lighting and reflective glass windows, especially tall skyscrapers.

- ***Avian vision relevant to collisions:*** Structures that seem clearly visible and hence avoidable under typical calm-weather daylight conditions, may become far less visible or at least avoidable by birds flying under conditions of poor visibility, e.g. at night or dusk/dawn, when flying into the direction of the sun which negatively effects forward vision, in conditions associated with rain, mist, fog, or low-hanging cloud, and under strong wind conditions, as well as when being pursued or otherwise distracted by other avian predators, competitors, while searching for food, indulging in territorial display flights, etc. (Benson & Dobbs 1984, Anderson 2003, Drewitt & Langston 2008). There is also now clear evidence that elevated structures that would seem obvious to the human eye are easily overlooked by some bird species, including vultures, in flight due to factors such as eye placement and hence field of view, as well as the direction in which some birds typically direct their view (often downwards and to the side rather than to the front) based on an ancestral evolutionary scenario that totally lacked the types of dangerous elevated anthropogenic structures that now populate landscapes (Martin et al. 2012). An aerial cable is also likely to be more visible when seen from the typical human position, i.e. from below and against the open sky, compared with the view of a flying bird, where the cable may be viewed from above or the side and against the ground and hence far less contrasting (Benson & Dobbs 1984)

- ***Collisions by nocturnal migrants with telecommunication-tower infrastructure:*** Relevant to telecommunications towers, the primary avian concerns have related to mortality ('towerkill') of nocturnal migrants (typically passerines/songbirds) associated with these structures (Kerlinger 2000, Anderson 2003, Erickson et al. 2005, Drewitt & Langston 2008, Gehring et al. 2011, Lundstrom et al. 2013). The issue has received most attention in North America. The worst-case scenarios of mass mortality seem associated with such nocturnal migrants becoming 'trapped' within the (typically aviation) lighting characteristic of these structures. This results in the birds fluttering around the tower either succumbing to collisions with the tower infrastructure, especially any lateral support cables but also sometimes the structures themselves, or to exhaustion, predation, etc. The situation is particularly aggravated during (indeed apparently largely restricted to) misty/foggy conditions, when the birds tend to fly lower and are more vulnerable to the light attraction and trapping effects. Wind direction may also be implicated in some circumstances, as well as phases of the moon. Tower elevation is also highly relevant (with those less than about 150 m in height rarely being problematic), with the problem disproportionately worsening with increasing tower height, bearing in mind also that telecommunication towers are typically located on the highest points in the landscape effectively raising their actual height above the primary surrounding landscape. Tower lighting, usually mandatory due to civil aviation requirements, seems a critical component of this problem, attracting and trapping the birds to within the illuminated area. Constant lighting seems worst, especially where red lighting is employed, with flashing lights being less problematic and the longer the time periods between the flashes the better (Drewitt & Langston 2008, Gehring et al. 2009).

Unlike the situation in temperate North America however, the sub-tropical South African avifauna is not dominated by migratory species to anywhere near the same extent. In particular, South Africa lies largely at the end point of the migrations of the migratory birds visiting the region from further north and hence unlikely to support the extensive migratory pathways and bottlenecks characteristic of other global regions more centrally situated relevant to avian migratory routes. Indeed, such problems of mass mortality at telecommunication-tower infrastructure by nocturnally migrating birds appear not to have been reported in South Africa.

- ***Collisions by large diurnal birds with telecommunication-tower infrastructure:*** In contrast to the apparent position relative to small avian nocturnal migrants, telecommunication-tower infrastructure in South Africa can

pose a real collision threat to large diurnal birds in flight. This issue is of especial concern as the construction of communication towers has increased exponentially worldwide (Anderson 2003, Erickson et al. 2005), including in South Africa. The vulnerability of these birds, including birds of prey such as eagles and vultures, to collisions with elevated structures is widely appreciated, especially as relevant to overhead electricity cables (Bernardino et al. 2018) but the general principle extends to all overhead cabling.

Telecommunication towers are typically placed on high points in the landscape, usually associated with mountain- and hill-tops, and long the edges of tall escarpments, in order to maximize transmission distances. Large flying birds, especially soaring species, are also typically attracted to such sites due the advantages they provide in terms of providing lift in flight associated with wind patterns around these elevated areas (e.g. Khoury 2017). This increases the vulnerability of large flying birds to collisions with infrastructure associated with these towers. This situation is very similar to that relevant to wind turbines which are also typically placed in elevated positions to take advantage of enhanced wind conditions at such sites, and which similarly increases the danger of collisions of large flying birds with the turbine blades. It should be emphasised that diurnally flying birds are vulnerable to collisions not only with overhead cables and moving wind-turbine blades but also with elevated wind towers themselves as tall structures in potentially sensitive locations (Choi et al. 2020).

Strong headwinds and low cloud ceilings tend to force birds to fly at lower heights and hence be more susceptible to collisions with structures such as communication towers, and air temperature and humidity also effect flight height (Drewitt & Langston 2008). Soaring raptors typically fly at lower heights during cool compared with hot weather (Khoury 2017).

Drewitt & Langston (2008) provide specific recommendations relevant to communication towers to minimize the danger of bird collisions:

- the construction of towers should be avoided in area characterised by regular low cloud or mist/fog,
- the construction of towers should also be avoided in areas which support appreciable populations of threatened birds vulnerable to collisions with the infrastructure associated with such towers,
- towers should be clustered as close to one another as possible in discrete ‘tower farms’,
- as far as possible, new communication equipment should be co-located on existing towers, even if owned by other entities,
- towers should be kept to below about 60 m in height,
- towers should comprise tubular monopoles similar to those used in modern wind turbines, rather than being lattice structures,
- lateral support cables should not be used, and
- where lateral support cables are present, these should carry clear marking devices, especially in areas inhabited by birds of prey (see also Bernardino et al. 2019).

The best documented case of mass mortality to vultures at a South African tower site relates to 55 Cape Vultures reported as having died in collisions with the lateral support cables of a particularly tall (235 m) radio and television transmission tower operated by the South African Broadcasting Service (SABC)/Sentach (Benson & Dobbs 1984). This tower is situated on the summit of a peak in the Waterberg Mountains in Limpopo

Province, within the Marakele National Park. The tower locality is situated in close proximity and directly above one of the two largest colonial breeding colonies of the Cape Vultures on cliff faces situated below the tower. The high mortality is related to this proximity of the tower to, and situated above, the colony. Young, recently fledged and inexperienced vultures are particularly vulnerable to these collisions. The lateral support cables of the tower have been marked to render them more visible but the problem persists, e.g. seven dead Cape Vulture collision victims were found during a search on 14 December 2012 (P.C. Benson unpublished

- ***Other interactions of large birds with telecommunication-tower infrastructure:*** Large birds are regularly attracted to tall structures such as telecommunication towers as attractive perches and even as nest sites (e.g. Washburn 2014). As local examples, Pied Crow's nest extensively on cellular communication towers (Senoge & Downs 2023) and Verreaux's Eagles nest on microwave towers on hilltops in the Northern Cape Province (Anderson 2000). These structures may thus be of some benefit to these birds as perches and nest sites but this attraction to these sites also increases the risk of collisions with the tower infrastructure.

  Use of the structures for perching and nesting can also cause problems to the tower communication, electrical and other components through the accumulated droppings of the birds and the placement of nesting material, which can include lengths of metal wiring, on the structure (Washburn 2014). These issues and conflicts are particularly well known relevant to electricity pylons, substations and other electrical infrastructure. It follows that all electrical components incorporated in telecommunication-tower infrastructure should be comprehensively insulated to avoid potential electrocution risks with associated bird mortality and potential communication-component failures (Kerlinger 2000). The use of tubular monopoles as opposed to lattice structures largely or totally eliminates the attractiveness of such structures to perching or nesting large birds (Saidur *et al*. 2011).

- ***Electricity pylons servicing telecommunication towers:*** Telecommunication towers typically require electrical power facilitated by electrical poles and associated overhead electrical cables routed to these sites. As alluded to above, these can also pose collision and electrocution risks to birds, particularly large species (Bernardino et al. 2018). These potential problems are likely to be particularly acute due to the remote and elevated situation of these sites, which, as mentioned above, are likely to attract disproportionately large numbers of such birds, including formally threatened species. It is therefore essential to pay conservation attention to this issue as well in the planning of telecommunication towers. This is similar to the situation relevant to wind and solar farms, which also require pylons connecting these facilities to the electrical grid and which thus need also to be included in the assessment and planning for such facilities (Ledec *et al.* 2011).

The powerlines servicing the tower should be of a 'bird-friendly' nature to eliminate or at least reduce by the maximum extent possible all dangers from collisions and electrocution (Bernardino et al. 2018). The relevant mitigation measures include careful routing of the powerlines to the site to avoid vulnerable areas, marking of the lines to render them of maximum visibility to birds using 'bird flappers' or bird 'spirals'/'pigtails' (Bernardino et al. 2019), and configuring/insulating the electrical infrastructure against electrocution risk (e.g. by deploying 'raptor-protector devices on particular power-pole configurations). These measures should be implemented proactively as they are typically far more expensive to ameliorate post-construction. In particularly vulnerable areas, consideration should be given to burying power lines approaching tower sites (although this is typically expensive).

6.5 Cultural Heritage Aspects of the area and Palaeontological Resources

6.5.1 Results of the Heritage Study

During the physical survey, the following sites, features and objects of cultural significance were identified in the study area:

- **Stone Age:** No sites, features or objects of cultural significance dating to the Stone Age were identified in the study area.
- **Iron Age:** No sites, features or objects of cultural significance dating to the Iron Age were identified in the study area.
- **Historic period:** No sites, features or objects of cultural significance dating to the historic period were identified in the study area.

6.5.2 Results of the Paleo Study

The Ecca Group, Vryheid Formation may contain fossils of diverse non-marine trace, *Glossopteris* flora, mesosaurid reptiles, palaeoniscid fish, marine invertebrates, insects, and crustaceans (Johnson 2009). *Glossopteris* trees rapidly colonised the large deltas along the northern margin of the Karoo Sea. Dead vegetation accumulated faster than it could decay, and thick accumulations of peat formed, which were ultimately converted to coal. It is only in the northern part of the Karoo Basin that the glossopterids and cordaitales, ferns, clubmosses and horsetails thrived (McCarthy and Rubidge 2005).

Fossils in South Africa mainly occur in rocks of sedimentary nature and not in rocks from igneous or metamorphic nature. Therefore, if there is the presence of Karoo Supergroup strata the palaeontological sensitivity is generally **LOW** to **VERY HIGH**.

Table 7: Taken from Palaeotechnical Report (Groenewald 2012) (**1cA)**.

Volksrust (Pvo)		Dark Grey Shale	Trace Fossils
Vryheid (Pv)		Light grey coarse- to fine-grained sandstone and siltstone. Dark coloured siltstone due to presence of carbon enrichment and coal beds	Abundant plant fossils of *Glossopteris* and other plants. Trace fossils. The reptile *Mesosaurus* has been found in the southern part of the Karoo Basin
Pietermaritzburg (Pp)		Dark Grey Shale	Trace Fossils
Dwyka (C-Pd / Pd)		Tillite, diamictite	None recorded in KwaZulu-Natal to date. the basin

Table 8: Criteria used (Fossil Heritage Layer Browser/SAHRA) **(1cB)**:

Rock Unit	Significance/vulnerability	Recommended Action
Vryheid Formation	**Very High**	Field assessment and protocol for finds is required
Pietermaritburg F	**Moderate/ Orange**	Desktop survey and Phase 1 PIA is recommended
Dwyka Group	**Moderate/ Orange**	Desktop survey and Phase 1 PIA is recommended

Impact significance: **MODERATE**, **VERY HIGH** for the Dwyka Group, Pietermaritzburg Formation, and Vryheid Formation, Karoo Supergroup. There are significant fossil resources that may be impacted by the development

(mudstone, shale) and if destroyed are no longer available for scientific research or other public good (Almond, *et al.* 2009).

The palaeontological sensitivity is as stated above and here in colour for the Option:
An area outlined in red balloons for the radio towers, power lines in green (south) and red (north) close to Paulpietersberg, Vryheid, Louwsburg and Ulundi. The approximate size of the towers ranges from 16 and 30 m^2.

Paul-Pietersburg tower – Vryheid Formation, Dolerite.
Vryheid north – Dolerite, Pietermaritzburg Formation.
Louwsberg tower – Dolerite, Vryheid Formation.
Vryheid south – Vryheid Formation.
3 x Ulundi Telecomms towers present on the Dwyka Group.

All the land involved in the development was assessed **(ni,nii)** and none of the property is unsuitable for development. **Fossils are generally absent from the Pietermaritzburg Formation although trace fossils have been recorded from the upper layers (AMAFA Palaeotech).**

The threats are: -

- Earth moving equipment/machinery (front end loaders, excavators, graders, dozers) during construction,
- The sealing-in or destruction of fossils by development, vehicle traffic, and human disturbance. See Description of the Geological Setting (F) above.

6.6 Sensitivity of the Landscape Character

6.6.1 Sensitivity of observers

The following observer groups have been identified in the study area:

- Tourists visiting points of interest in the study area for example holiday resorts or participating in outdoor adventure activities;
- Residents; and
- Motorists utilising the local road network.

Tourists are generally classified as observers with a high sensitivity when their reason for visiting the area is focussed on enjoying the visual quality and engaging in outdoor activities that are offered by the study area's natural landscape. A number of outdoor activities are hosted in the area in particularly paragliding that specifically uses the Dumbe Mountain as their launching base. These tourists will be in close proximity to the proposed tower for a brief period before launching from the edge of the mountain. The duration of their visual exposure will therefore be limited.

Lodges and other forms of tourist destination are present in Paulpietersburg as well as to the south of the tower site for example Penbi Game Range and Natal Spa Resort. These observers are outside of the ZMVE and partial screening, as illustrated in the study area photographs, will significantly reduce their visual exposure, thereby lowering their sensitivity to a medium degree.
Tourists' visual exposure is limited to the time they spend in the study area and could be anywhere between a couple of hours, to a few days. This is considered a very short duration. Viewer incidence is also considered

relatively low as this area is not considered a major national tourist attraction as for example Table Mountain. Some of the tourist attractions are further than 8 km away and will experience a considerably reduced visibility due to the distance factor. It can be concluded that visual impact on these observers will be negligible.

Residents in the study area are generally classified as visual receptors of high sensitivity owing to their sustained visual exposure and attentive interest towards their living environment. The highest concentration residents are present in Paulpietersburg and Dumbe, who will be the closest to the tower, but outside of the ZMVE. The surrounding farms are sparsely populated and spread out with a few farmsteads located inside the ZMVE, but most falling outside the ZMVE. On the eastern periphery of the ZVI, rural communities namely Blinkwater, Schaapkraal and Slangspuit, are present. Their exposure to the potential visual impacts will be negligible due to their distance from the source of impact.

Motorists are considered the least sensitive group of observers due to the speed at which they travel and their brief exposure to impacts. This group is mostly limited to road users on the R33 & P34-4 to Vryheid. Intermitted views of the proposed tower are expected as motorists travel through the study area. Their location outside of the ZMVE and brief exposure to the source of impact lowers their sensitivity to very low.

6.6.2 Sensitivity of the Landscape Character

The majority of the study area is considered to have a medium VAC, although some areas may present a high VAC. Most of the study area will have a direct line-of-sight to the proposed tower if exclusively considering the topography. The topography will provide partial screening of the tower for areas within 4-6km from the tower site, and complete screening in a band to the north and a sizable area to the southeast. A landcover factor that increases the VAC are the numerous plantations in the western half of the study area as well as the established gardens in the town of Paulpietersburg and surroundings. These factors will increase the screening capacity of the landscape and reduce visual exposure to the tower.

A high degree of inter-visibility between adjacent landscapes are expected due to the elevated location of the tower. This is also confirmed via the viewshed analysis, although the argument with regards to the increased screening capacity due to the land cover conditions, also applies in this case.

Towers or masts are familiar objects in the South African landscape. For example, cellular towers are dotted across the rural and urban landscapes and have a resemblance to the proposed telecommunication radio tower with regards to its visual characteristics. The proposed tower will be placed in a location on the Dumbe Mountain that already has other towers/masts. Therefore, an additional tower is considered familiar with the existing context, although the remainder of the Dumbe Mountain is completely undeveloped, and the cluster of towers are fairly noticeable. The horizon line will be altered, thereby causing visual conflict with the pristine character of the mountain.

The landscape character sensitivity is considered high and is accredited to the generally high scenic quality of the study area, high value landscape attributes for example the Dumbe Mountain and associated tourism activities, and a medium VAC. The tower will be highly exposed due to its elevated location, therefore resulting in a large ZVI. The sense of place is largely defined by the undeveloped, rural land cover that varies between plantations and areas of natural grassland. Pristine natural areas have pleasing visual attributes and contributes to a high scenic quality.

6.7 Agricultural Potential Impact

There is no evidence of cultivated areas across the project site, also based on the land use map of the area; there are no commercial agricultural activities in the area. Although, the area has medium potential for agriculture based on the classification indicated in **Figure 23**, the agricultural value of the area is low due to lack of commercial agricultural productivity in the area. Therefore, based on the fact that the site has low agricultural productivity level, the land can be utilized for the proposed Paulpietersberg Tower construction. The area required (300 m) for constructing the tower will not have significant impact on the area available for agriculture.

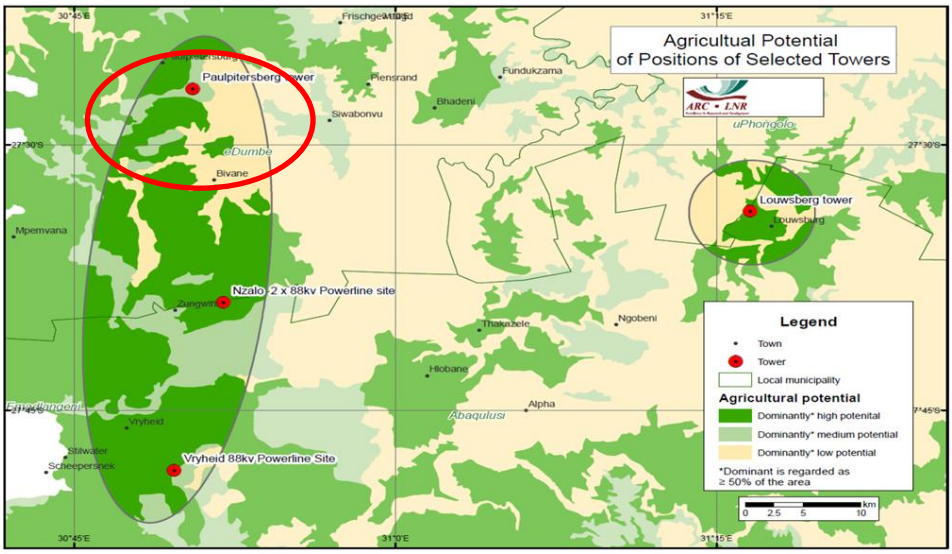

Figure 23: Agricultural Potential Map of the Study Area

Therefore, based on the fact that the site area has low agricultural productivity level, the land can be utilized for the proposed Tower construction. The area required (300 m) for constructing the tower will not have significant impact on the area available for agriculture

- **Probability of impact**: The various site areas are vacant and not utilized for agricultural production with major parts of the sites having low to medium agricultural potential
- **Severity of impact**: There are no major agricultural activities at the sites except for patches of grazing land and homesteads hence the impact will be low
- **Significance of impact**: Mainly due to low agricultural potential of areas. The soil characteristics (tower areas) also confirms the land portion is currently not suitable for commercial agriculture

The site areas are not of commercial agriculture value. The project requires about 300m footprint per project site which will not have any major significant impact on land availability for agricultural production in the future.

6.8 Social environment Impacts

The following impacts are identified as the major impacts associated with the development of the project the construction and operational phases of the development.

- Inflow of Workforce and Jobseekers

- Employment Opportunities and Local Procurement
- Impact on Sense of Place
- Impact on Tourism:

6.9 Assumptions, uncertainties, and gaps in knowledge of the study

A number of limitations and assumptions, as described below, are noted for this environmental impact assessment.

- A Visual Impact Assessment is not a purely objective science and often integrates qualitative evaluations based on human perceptions. It is the visual specialist's aim to utilise as much quantitative data and scientific research as possible, to substantiate professional judgement and to motivate subjective opinions
- The realistic poor mitigation scenario assumes the following:
    - The tower location as currently planned will be implemented.
    - Access and haulage roads during the construction phase will be poorly planned and regulated.
    - All towers will be established outside of river and wetland units and a 30m buffer zone.
- The realistic good mitigation scenario assumes the following:
    - All the planning and design measures recommended will be adhered to.

7 ASSESSMENT OF POTENTIAL IMPACTS

7.1 Methodology of the Impact Assessment

The identification of potential impacts includes impacts that may occur during the construction, operational and decommissioning phases of the proposed development. The assessment of impacts includes direct, indirect as well as cumulative impacts. In order to identify potential impacts (both positive and negative) it is important that the nature of the proposed projects is well understood so
that the impacts associated with the projects can be assessed. The process of identification and assessment of impacts includes:

- Determining the current environmental conditions in sufficient detail so that there is a baseline against which impacts can be identified and measured;
- Determining future changes to the environment that will occur if the activity does not proceed;
- Develop an understanding of the activity in sufficient detail to understand its consequences; and
- The identification of significant impacts which are likely to occur if the activity is undertaken.

The impact assessment methodology has been aligned with the requirements for BA Reports as stipulated in Appendix 1 (3) (1) (j) of the 2014 NEMA EIA Regulations (as amended), which states the following:

"A BA Report must contain the information that is necessary for the Competent Authority to consider and come to a decision on the application, and must include an assessment of each identified potentially significant impact and risk, including –

(i) cumulative impacts;
(ii) the nature, significance and consequences of the impact and risk;
(iii) the extent and duration of the impact and risk;
(iv) the probability of the impact and risk occurring;
(v) the degree to which the impact and risk can be reversed;
(vi) the degree to which the impact and risk may cause irreplaceable loss of resources; and
(vii) the degree to which the impact and risk can be mitigated".

As per the DEAT Guideline 5: Assessment of Alternatives and Impacts, the following methodology is applied to the prediction and assessment of impacts and risks. Potential impacts and risks have been rated in terms of the direct, indirect and cumulative:

- **Direct impacts** are impacts that are caused directly by the activity and generally occur at the same time and at the place of the activity. These impacts are usually associated with the construction, operation or maintenance of an activity and are generally obvious and quantifiable.
- **Indirect impacts** of an activity are indirect or induced changes that may occur as a result of 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 as a result of the activity.
- **Cumulative impacts** are impacting 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. therefore, assuming worst case scenario.

In addition to the above, the impact assessment methodology includes the following aspects whereby the significance of the impact is calculated as follows and rating significance is explained below.

- 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; or;
    - 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); and
    - 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); and
    - 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 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).

7.2 Impact Assessment

The specialist findings presented in this section represents a summary of the detailed and original specialist studies contained in the relevant appendices to this report **(Appendices E1 to E5).** The current summary of specialist findings is provided in the interest of brevity and with a view to facilitating public facilitating public participation; as contemplated in the NEMA principles. The Competent Authority, with its mandate of substantive review of the EIA report, is therefore urged to also read the original specialist studies in the relevant appendices to this report with the aim of discharging its decision-making function. *Should any discrepancy occur between this summary, and the relevant detailed specialist study; the detailed specialist study will prevail.*

The tables below for each field of study are impacts for **line deviations**. In some instances, where there is an impact specific to one of the lines deviation, this will be stipulated in **red.** Cumulative impacts have been discussed in each sub-section below for the respective field of study.

7.2.1 Aquatic and Wetland Impact Assessment

NATURE OF POTENTIAL IMPACT/RISK	SIGNIFICANCE (WITHOUT MITIGATION)	PROPOSED MITIGATION	SIGNIFICANCE (WITH MITIGATION)
CONSTRUCTION PHASE IMPACTS			
Impact 1: Physical Disturbance, Erosive water and/ or eroded sediment and Pollutants **Nature**: Changing the quantity and fluctuation properties of the watercourse by for example diverting or obstructing flow. **Activity**: The sources of this impact include the compaction of soil, the removal of vegetation, surface water redirection, changes to watercourse morphology or input of high energy surface water which could occur during construction and operation of the residential development. ***Residual Risks: Considered to be low given that optimal design is followed***	**LOW**	• Stormwater generated by the upgraded and new roads should be discharged at regular intervals and many small outlets should be favoured over few large. • Stormwater outlets must not be established within wetlands or riparian zones. • As far as practically possible, stormwater conveyance should be via open drains rather than pipes and conveyance from the road drains to the outlets should via open drains with vegetated or rough surfaces that are armoured with erosion protection. • All outlets must be designed to dissipate the energy of outgoing flows to levels that present a low erosion risk. In this regard, suitably designed energy for gravel roads will need to be installed at appropriate locations. • All erosion protection measures must be established to reflect the natural slope of the surface and located at the natural ground-level.	**LOW**
OPERATIONAL PHASE			
Impact 1: Physical Disturbance, Erosive water and/ or eroded sediment and Pollutants **Nature**: Changing the quantity and fluctuation properties of the watercourse by for example diverting or obstructing flow. **Activity**: The sources of this impact include the compaction of soil, the removal of vegetation, surface water redirection, changes to watercourse morphology or input of high	**LOW**	• Wherever possible, existing vegetation cover on the development site should be maintained during the construction phase. The unnecessary removal of groundcover from slopes must be prevented, especially on steep slopes which will not be developed. • Clearing activities must only be undertaken during agreed working times and permitted weather conditions. If heavy rains are expected, clearing activities should be put on hold. In this regard, the contractor must be aware of weather forecasts. • All bare slopes and surfaces to be exposed to the elements during clearing and earthworks must be protected against erosion using rows of hay-bales, sandbags and/or silt fences aligned along the contours and spaced at regular intervals (e.g. every 2m) to break the energy	**LOW**

NATURE OF POTENTIAL IMPACT/RISK	SIGNIFICANCE (WITHOUT MITIGATION)	PROPOSED MITIGATION	SIGNIFICANCE (WITH MITIGATION)
energy surface water which could occur during construction and operation of the residential development. ***Residual Risks: Considered to be low given that optimal design is followed***		of surface flows. • Once shaped, all exposed/bare surfaces and embankments must be re-vegetated immediately. • If re-vegetation of exposed surfaces cannot be established immediately due to phasing issues, temporary erosion and sediment control measures must be maintained until such a time that re-vegetation can commence. • All temporary erosion and sediment control measures must be monitored for the duration of the construction phase and repaired immediately when damaged. All temporary erosion and sediment control structures must only be removed once vegetation cover has successfully recolonised the affected areas. • After every rainfall event, the contractor must check the site for erosion damage and rehabilitate this damage immediately. Erosion rills and gullies must be filled-in with appropriate material and silt fences or fascine work must be established along the gulley for additional protection until vegetation has re-colonised the rehabilitated area.	

7.2.2 Terrestrial ecological (Flora & Fauna): Impact Assessment

NATURE OF POTENTIAL IMPACT/RISK	SIGNIFICANCE (WITHOUT MITIGATION)	PROPOSED MITIGATION	SIGNIFICANCE (WITH MITIGATION)
CONSTRUCTION PHASE IMPACTS			
Impact 1: Impacts to terrestrial vegetation communities and habitat **Nature:** **a) Direct ecosystem destruction and modification impacts** • Planned direct impacts to disturbed moderate sensitivity grassland for tower establishment. • Planned direct impacts to disturbed moderate sensitivity grassland for access road establishment. • Accidental direct impacts to disturbed moderate sensitivity grassland by heavy machinery during construction i.e. poorly planned access roads. **b) Indirect ecosystem disturbance impacts** • Erosion and/or sedimentation of Primary Grassland due to soil and vegetation clearing and landcover disturbance during construction. • Pollution of Primary Grassland due to the mishandling of hazardous substances and/or improper maintenance of machinery during construction e.g. oil and diesel leaks and spills. **Residual Impacts**: There will be negligible residual impacts to primary grassland if the recommended mitigation measures are effectively implemented.	**MEDIUM**	**Refer to section 7of Appendix E2 for general mitigations on:** • 7.1.1 Tower Location and Design Recommendations • 7.1.2. Tower Access and Service Roads • 7.2.1. Tower Access and Haulage Roads • 7.2.3. Demarcation of 'No-Go' areas and construction corridors • 7.2.4. Method Statements for working in sensitive ecosystems • 7.2.10. General rehabilitation guidelines • 7.2.11. Construction phase monitoring measures **Refer to section 7of Appendix E2 for general mitigations on:** • 7.2.4. Method Statements for working in sensitive ecosystems • 7.2.5. Runoff, erosion and sediment control • 7.2.6. Hazardous substances / materials management • • 7.2.7. Invasive Alien Plant control • • 7.2.9. Noise, dust and light pollution minimisation • • 7.2.10. General rehabilitation guidelines • • 7.2.11. Construction phase monitoring measures	**LOW**

NATURE OF POTENTIAL IMPACT/RISK	SIGNIFICANCE (WITHOUT MITIGATION)	PROPOSED MITIGATION	SIGNIFICANCE (WITH MITIGATION)
Impact 2: Impacts to terrestrial biota / species **Nature:** **a) Direct ecosystem destruction and modification impacts** • Fauna displacement and/or flora and fauna fatalities during planned direct impacts to Grassland habitat for pylon establishment. • Fauna displacement and/or flora and fauna fatalities during planned direct impacts to grassland habitat for access road establishment. • Fauna displacement and/or flora and fauna fatalities as a result of accidental direct impacts to Grassland habitat by heavy machinery during construction i.e. poorly planned access roads. **b) Indirect ecosystem disturbance impacts** • Erosion and/or sedimentation of grassland, wooded grassland and woodland habitat due to soil and vegetation clearing and landcover disturbance during construction. • Pollution of grassland, wooded grassland and woodland habitat due to the mishandling of hazardous substances and/or improper maintenance of machinery during construction e.g. oil and diesel leaks and spills. **Residual Impacts**: Negligible residual impacts if all mitigation measures are implemented effectively and important biota effectively rescued and removed.	**MEDIUM-**	**Refer to section 7of Appendix E2 for general mitigations on:** • 7.1.1 Tower Location and Design Recommendations • 7.1.2. Tower Access and Service Roads • 7.2.1. Tower Access and Haulage Roads • 7.2.2. Threatened and Protected Plant Search and Rescue • 7.2.3. Demarcation of 'No-Go' areas and construction corridors • 7.2.4. Method Statements for working in sensitive ecosystems • 7.2.8. Prohibitions related to animals • 7.2.10. General rehabilitation guidelines • 7.2.11. Construction phase monitoring measures	**LOW**
		Refer to section 7of Appendix E2 for general mitigations on: • 7.2.4. Method Statements for working in sensitive ecosystems • 7.2.5. Runoff, erosion and sediment control • 7.2.6. Hazardous substances / materials management • • 7.2.7. Invasive Alien Plant control • • 7.2.9. Noise, dust and light pollution minimisation • • 7.2.10. General rehabilitation guidelines • • 7.2.11. Construction phase monitoring measures	**LOW**

NATURE OF POTENTIAL IMPACT/RISK	SIGNIFICANCE (WITHOUT MITIGATION)	PROPOSED MITIGATION	SIGNIFICANCE (WITH MITIGATION)
Impact 3: Impacts to local and regional landscape ecological processes **Nature:** **1. Direct ecosystem destruction and modification impacts** • Ecosystem fragmentation during planned direct impacts to Grassland for tower establishment. • Ecosystem fragmentation during planned direct impacts to Grassland for access road establishment. • Fauna displacement and/or fatalities as a result of accidental direct impacts to Grassland by heavy machinery during construction i.e. poorly planned access roads. **2. Indirect ecosystem disturbance impacts** • Flora and fauna stress and/or fatalities as a result of erosion and/or sedimentation of Grassland due to soil and vegetation clearing and landcover disturbance during construction. • Flora and fauna stress and/or fatalities as a result of pollution of Grassland due to the mishandling of hazardous substances and/or improper maintenance of machinery during construction e.g. oil and diesel leaks and spills. **Residual Impacts**: none	**LOW**	**Refer to section 7of Appendix E2 for general mitigations on:** • 7.1.1. Tower Location and Design Recommendations • 7.1.2. Tower Access and Service Roads • 7.2.1. Tower Access and Haulage Roads • 7.2.2. Threatened and Protected Plant Search and Rescue • 7.2.3. Demarcation of 'No-Go' areas and construction corridors • 7.2.4. Method Statements for working in sensitive ecosystems • 7.2.8. Prohibitions related to animals • 7.2.10. General rehabilitation guidelines • 7.2.11. Construction phase monitoring measures	**LOW**
OPERATIONAL PHASE			
Impact 1: Impacts to terrestrial vegetation communities and habitat **Nature** **1a) Direct ecosystem destruction and modification impacts** Accidental direct impacts to Grassland by heavy machinery during repair and maintenance i.e. poorly planned access roads.	**MEDIUM-LOW**	**Refer to section 7of Appendix E2 for general mitigations on:** • 7.3.1. Maintenance and management • 7.3.2. Monitoring **Refer to section 7of Appendix E2 for general mitigations on:**	**LOW**

NATURE OF POTENTIAL IMPACT/RISK	SIGNIFICANCE (WITHOUT MITIGATION)	PROPOSED MITIGATION	SIGNIFICANCE (WITH MITIGATION)
1b) Indirect ecosystem disturbance impacts • Erosion and/or sedimentation of Primary Grassland due to soil and vegetation clearing and landcover disturbance during repair and maintenance. • Pollution of Primary Grasslan ddue to the mishandling of hazardous substances and/or improper maintenance of machinery during repair and maintenance. **Residual Impacts**: Negligible residual impacts to Primary Grassland if the recommended mitigation measures are effectively implemented.		• 7.3.1. Maintenance and management • 7.3.2. Monitoring	
Impact 2: Impacts to terrestrial biota / species **Nature** **a) Direct ecosystem destruction and modification impacts** Fauna displacement and/or fatalities as a result of accidental direct impacts to Primary Grassland habitat by heavy machinery during repair and maintenance i.e. poorly planned access / service roads. **b) Indirect ecosystem disturbance impacts** • Flora and fauna stress and/or fatalities as a result of erosion and/or sedimentation of Primary Grassland habitat due to soil and vegetation clearing and landcover disturbance during repair and maintenance. • Flora and fauna stress and/or fatalities as a result of pollution of Primary Grassland habitat due to the mishandling of hazardous substances and/or improper maintenance of machinery during repair and maintenance. **Residual Impacts**: Negligible residual impacts if all mitigation measures are implemented effectively.	**MEDIUM**	**Refer to section 7of Appendix E2 for general mitigations on:** • 7.1.1. Tower Location and Design Recommendations • 7.1.2. Tower Access and Service Roads • 7.3.1. Maintenance and management • 7.3.2. Monitoring	**MEDIUM-LOW**
		Refer to section 7of Appendix E2 for general mitigations on: • 7.1.3. Service Road Stormwater Management • 7.3.2. Monitoring	**MEDIUM**

NATURE OF POTENTIAL IMPACT/RISK	SIGNIFICANCE (WITHOUT MITIGATION)	PROPOSED MITIGATION	SIGNIFICANCE (WITH MITIGATION)
Impact 3: Impacts to local and regional landscape ecological processes **Nature:** **a) Direct ecosystem destruction and modification impacts** • Fauna displacement and/or fatalities as a result of accidental direct impacts to Primary Grassland by heavy machinery during dismantling and rehabilitation i.e. poorly planned access roads. **b) Indirect ecosystem disturbance impacts** • Flora and fauna stress and/or fatalities as a result of erosion and/or sedimentation of Primary Grassland due to soil and vegetation clearing and landcover disturbance during repair and maintenance. • Flora and fauna stress and/or fatalities as a result of pollution of Primary Grassland due to the mishandling of hazardous substances and/or improper maintenance of machinery during repair and maintenance. **Cumulative Impacts**: none **Residual Impacts**: none	**LOW**	• 7.1.1. Tower Location and Design Recommendations • 7.1.2. Tower Access and Service Roads • 7.3.1. Maintenance and management • 7.3.2. Monitoring 7.1.3. Service Road Stormwater Management 7.3.2. Monitoring	**LOW**

7.2.3 Avifauna Impact Assessment

NATURE OF POTENTIAL IMPACT/RISK	SIGNIFICANCE (WITHOUT MITIGATION)	PROPOSED MITIGATION	SIGNIFICANCE (WITH MITIGATION)
CONSTRUCTION PHASE IMPACTS			
Impact 1: Displacement of SCC and non-SCC priority species as a result of disturbance. Excavation and construction activities are a source of significant disturbance particularly as a result of the machinery and construction personnel that are present on site for the duration of the construction. For most bird species, construction activities are likely to be a cause of temporary disturbance impacting on foraging, and roosting behaviours but in more extreme cases, construction may impact on the breeding success of certain species particularly if the disturbance happens during a critical part of the breeding cycle, resulting in temporary breeding failure or permanent nest abandonment. The development area is already subjected to a degree of disturbance in the form of settlement, and pastoral activities, the existing power line network, in addition to vehicle and pedestrian traffic. Construction activities within the study are likely to result in the temporary displacement as opposed to permanent displacement of species from the area.	**MEDIUM**	• Access to the remainder of the site should be strictly controlled to prevent unnecessary disturbance of priority species. • Measures to control noise should be applied according to current best practice in the industry.	**LOW**
OPERATIONAL PHASE IMPACTS			
Impact 1: Proposed Paulpietersburg ALT RS tower **Nature:** Potential collision hazard posed to large flying birds, especially threatened species, by the construction of 60 m tall telecommunication tower at an existing tower farm on a hilltop near Paulpietersburg, KZN. **Residual risks**: There will be some residual risk even if the mitigation measures are implemented as large flying birds could still collide with the	**MEDIUM**	The two critical mitigation actions are: 1 – to co-locate the new communication equipment on existing towers at the site, and 2: if this is not possible, that no lateral support cable be used in the tower design.	**LOW**

NATURE OF POTENTIAL IMPACT/RISK	SIGNIFICANCE (WITHOUT MITIGATION)	PROPOSED MITIGATION	SIGNIFICANCE (WITH MITIGATION)
towers themselves, either existing ones or new towers, especially under conditions of low visibility, e.g. in mist.			
Impact 2: Potential hazard from servicing powerline **Nature:** Potential collision and electrocution hazard posed to large flying birds, especially threatened species, by the existing or any new powerline constructed to service a telecommunication tower at an existing tower farm on a hilltop near Paulpietersburg, KZN. **Residual risks:** There will be some residual risk even if the mitigation measures are implemented as large flying birds could still collide with the overhead lines, especially under conditions of low visibility, e.g. in mist. Placing the powerlines underground though would carry no residual risk.	**MEDIUM**	Mitigation against collison would involve fitting bird diverters ('flappers' and/or 'coils' to the overhead lines at 2 m intervals. Mitigation against electrocution would involve careful pylon design and insulation, e.g. the use of 'raptor protector' devices. Consideration could also be given to burying the powerline, especially in the higher-altitude section of the line closest to the tower farm.	**LOW**

7.2.4 Heritage & Palaeontological Impact Assessment

NATURE OF POTENTIAL IMPACT/RISK	SIGNIFICANCE (WITHOUT MITIGATION)	PROPOSED MITIGATION	SIGNIFICANCE (WITH MITIGATION)
CONSTRUCTION PHASE IMPACTS			
Impact 1: Direct or physical impacts, implying alteration or destruction of heritage features (Greenfield VGF 1 & Greenfield 3A Tower) **Nature**: As no sites, features or objects of cultural heritage significance were identified on the project area, there would be no impact as a result of the proposed development	**LOW**	• Known sites should be clearly marked in order that they can be avoided during construction activities. • The contractors and workers should be notified that archaeological sites might be exposed during the construction activities. • Should any heritage artefacts be exposed during excavation, work on the area where the artefacts were discovered, shall cease immediately and the Environmental Control Officer shall be notified as soon as possible; • All discoveries shall be reported immediately to a heritage practitioner so that an investigation and evaluation of the finds can be made. Acting upon advice from these specialists, the Environmental Control Officer will advise the necessary actions to be taken; • Under no circumstances shall any artefacts be removed, destroyed or interfered with by anyone on the site; and • Contractors and workers shall be advised of the penalties associated with the unlawful removal of cultural, historical, archaeological or palaeontological artefacts, as set out in the National Heritage Resources Act (Act No. 25 of 1999), Section 51. (1).	**LOW**
Impact 2: Destruction, Damage & Loss of fossil material The sources of these impacts include the, the removal of vegetation, sealing-in or destruction of fossils, and digging of foundations. This activity is particularly significant where tower is constructed.	**LOW**	• Footprint of tower foundation should be as small as possible • The following should be conserved: if any palaeontological material is exposed during clearing, digging, excavating, drilling or blasting, SAHRA must be notified. All development activities must be stopped and a palaeontologist should be called in to determine proper mitigation measures. • Condition in which development may proceed: It is further suggested that a Section 37(2) agreement of the Occupational, Health and Safety Act 85 of 1993 is signed with the relevant contractors to protect the environment (fossils) and adjacent areas as well as for safety and	**LOW**

NATURE OF POTENTIAL IMPACT/RISK	SIGNIFICANCE (WITHOUT MITIGATION)	PROPOSED MITIGATION	SIGNIFICANCE (WITH MITIGATION)
		security reasons.	
OPERATIONAL PHASE IMPACTS			
Impact 1: Loss or damage to sites, features or objects of cultural heritage significance **Nature:** A number of historic features are known to exist in the project area. These, irrespective of their state of conservation, enjoy general protection under the Heritage Act as they might be older than 60 years	**MEDIUM**	• (1) Avoidance/Preserve: It is recommended that the tower site is moved at least 100m to the west, north or south of the present position. • The burial site should be fenced off by means of a wire fence or danger tape with a buffer zone of at least 50m for the duration of construction activities.	**LOW**

7.2.5 Visual Impacts Assessment

NATURE OF POTENTIAL IMPACT/RISK	SIGNIFICANCE (WITHOUT MITIGATION)	PROPOSED MITIGATION	SIGNIFICANCE (WITH MITIGATION)
CONSTRUCTION PHASE IMPACTS			
Impact 1: Severity of impacts on observers (OB) i.e. Residents and Tourists inside ZMVE inside Zone of Maximum Visual Exposure (ZMVE) **Nature of impact**: The construction phase will introduce new elements to the visual environment (i.e., construction equipment) that are otherwise uncharacteristic within the context of the site, i.e., the top of the Dumbe Mountain. The existing vegetation cover within the footprint of the construction operations, will be damaged/removed and the underlaying soil will be exposed due to earthworks. This will cause the removal of the plant cover that is part of the baseline character of the site. Unsightly scarring of the landscape will negatively impact on the visual quality of the visual resource and the pristine nature of the site. **Residual Risks:** Residual risks can be effectively reduced if all the proposed mitigation measures are implemented, in particular the sharing of a single tower with other service providers. Other mitigation measures are cosmetic and will have limited effects.	**MEDIUM**	**1. Avoidance** 1.1. Avoid constructing a new tower by co-locating the telecommunication radio infrastructure on an existing tower thereby significantly reducing the risk sources and associated impacts. **2. Reduction** 2.1. Minimise the disturbance footprint by clearly marking the working area and thereby limiting construction activities within a dedicated area. 2.2. Locate the lay-down area and construction camp in an area that is already disturbed, for example in the forested areas on the foot slopes of the mountain. **3. Remediation** 3.1. Erect a 2-3m high, temporary screen around the construction site with a material that simulates the vegetation's colour and texture, for example camouflage netting, to restrict visibility. 3.2. Keep the construction site neat and clean. Dispose all waste material in suitably closed containers and remove off site at regular intervals. **4. Enhancement** 4.1. Rehabilitate the disturbed area as soon as possible to minimise the impact of exposed soil and re-establish a vegetation cover.	**LOW**

NATURE OF POTENTIAL IMPACT/RISK	SIGNIFICANCE (WITHOUT MITIGATION)	PROPOSED MITIGATION	SIGNIFICANCE (WITH MITIGATION)
Impact 2: Severity of impacts on observers (OB) (i.e. Residents & tourist outside ZMVE & Motorist) **Nature of impact**: Visual intrusion can be expected due to the unsightly construction activity and the interference on the views of the surrounding observers. The early construction activities which involve the base preparations, are expected to have a limited ZVI and will only influence observers that visit the top of Dumbe Mountain for example paragliders. As the tower construction extend its height, the ZVI will increase and affect observers in a larger zone. **Residual Risks:** Residual risks can be effectively reduced if all the proposed mitigation measures are implemented, in particular the sharing of a single tower with other service providers. Other mitigation measures are cosmetic and will have limited effects.	**LOW**	• Minimise the disturbance footprint by clearly marking the working area and thereby limiting construction activities within a dedicated area. • Locate the lay-down area and construction camp in an area that is already disturbed, for example in the boundaries of the Duma Substation. • Construct the substation and tower at the same time to avoid extended construction phases. • Erect a 2-3m high, temporary screen around the construction site with a material that simulates the vegetation's colour and texture, for example camouflage netting, to restrict visibility. • Keep the construction site neat and clean. Dispose all waste material in suitably closed containers and remove off site at regular intervals.	**VERY LOW**

NATURE OF POTENTIAL IMPACT/RISK	SIGNIFICANCE (WITHOUT MITIGATION)	PROPOSED MITIGATION	SIGNIFICANCE (WITH MITIGATION)
Impact 3: Severity of impacts on the Landscape character (LC) **Nature of impact**: The majority of the study area is considered to have a medium VAC, although some areas may present a high VAC. Most of the study area will have a direct line-of-sight to the proposed tower if exclusively considering the topography. The topography will provide partial screening of the tower for areas within 4-6km from the tower site, and complete screening in a band to the north and a sizable area to the southeast. A landcover factor that increases the VAC are the numerous plantations in the western half of the study area as well as the established gardens in the town of Paulpietersburg and surroundings. These factors will increase the screening capacity of the landscape and reduce visual exposure to the tower. **Residual Risks:** Residual risks can be effectively reduced if all the proposed mitigation measures are implemented, in particular the sharing of a single tower with other service providers. Other mitigation measures are cosmetic and will have limited effects.	**MEDIUM**	• Minimise the disturbance footprint by clearly marking the working area and thereby limiting construction activities within a dedicated area. • Locate the lay-down area and construction camp in an area that is already disturbed, for example in the boundaries of the Duma Substation. • Construct the substation and tower at the same time to avoid extended construction phases. • Erect a 2-3m high, temporary screen around the construction site with a material that simulates the vegetation's colour and texture, for example camouflage netting, to restrict visibility. • Keep the construction site neat and clean. Dispose all waste material in suitably closed containers and remove off site at regular intervals.	**LOW**
OPERATIONAL PHASE			
Impact 1: Severity of impacts on observers (OB) and landscape character (LC) **Nature of impact**: The completed project will introduce another tower on the Dumbe Mountain, thereby altering the horizon line and impacting on the landscape character. The horizon line will feature a denser cluster of towers thereby increasing the visual dominance of tower infrastructure. A visual change will be noticeable and will cause visual intrusion on the observers within the ZMVE. The tower is considered a relatively tall but slender structure and adding its elevated location, has a large potential ZVI. A	**MEDIUM**	**1. Avoidance** 1.1. Avoid erecting an additional tower on the Dumbe Mountain by co-locating services on a single existing tower. This will cause a minimal visual change and therefore reduce impacts to insignificant levels; **2. Reduction** 2.1. Erect the proposed tower but negotiate with other service providers to dismantle their tower/s and co-locate services on a single new tower. 2.2. Restrict the height of the tower to the minimum effective operating height.	**LOW**

NATURE OF POTENTIAL IMPACT/RISK	SIGNIFICANCE (WITHOUT MITIGATION)	PROPOSED MITIGATION	SIGNIFICANCE (WITH MITIGATION)
mitigating factor is its slender, lattice structure that has a relatively small "visual footprint" and becomes increasingly more difficult to detect over distances further than 5km. **Residual Risks:** Residual risks can be effectively reduced if all the proposed mitigation measures are implemented, in particular the sharing of a single tower with other service providers. Other mitigation measures are cosmetic and will have limited effects.		**3. Remediation** 3.1. Consider painting the tower with muted colours of grey and blue to resemble the background colour of the sky. This can only be considered if it complies with South African Civil Aviation Authority regulations.	

7.2.6 Agriculture Potential Impact Assessment

NATURE OF POTENTIAL IMPACT/RISK	SIGNIFICANCE (WITHOUT MITIGATION)	PROPOSED MITIGATION	SIGNIFICANCE (WITH MITIGATION)
CONSTRUCTION PHASE IMPACTS			
Impact 1: Loss of agricultural land (land that is no longer able to be utilized due to construction) **Nature:** Construction activities, Vehicle operation on site, Dust generation and the creation of access roads. **Indirect Impacts:** Overall loss of farmland, income and change in livelihood **Cumulative Impacts:** Tower footprints are limited in spatial extent and once in place do not lead to additional spatial or land use impacts.	**LOW**	The site areas are not of commercial agriculture value. The project requires about 900 m2 footprint per project site which will not have any major significant impact on land availability for agricultural production in the future.	**LOW**
OPERATIONAL PHASE IMPACTS			
Operation of the Tower Loss of agricultural production	**LOW**	• Tower footprints and infrastructure are permanent and cannot be mitigated	**LOW**

7.2.7 Social Impacts Assessment

NATURE OF POTENTIAL IMPACT/RISK	SIGNIFICANCE (WITHOUT MITIGATION)	PROPOSED MITIGATION	SIGNIFICANCE (WITH MITIGATION)
CONSTRUCTION PHASE IMPACTS			
Construction and operation activities of the Tower **Direct Impacts:** Inflow of Workers **Indirect Impacts:** The influx of outsiders to an area is also almost always perceived to increase the crime levels in such an area. One could therefore assume that security concerns would be prevalent among the local residents. **Cumulative Impacts:** Construction workers remaining in the larger area once this development has been completed.	**LOW**	• Local labourers should be employed where possible. • Labourers should remain at their existing residences. No workers should thus be accommodated on site at night. The erection of a construction camp where workers would be housed would not be recommended. • Before construction commences, representatives from the municipality, other community leaders (e.g. councillors) and as well as management structures of the security villages and complexes, as well as residential areas should be informed of the details of the contractors, size of the workforce and construction schedules. • The contractor should make certain that the "outside" workforce carry identification tags or uniforms to be easily identifiable. It should furthermore be ensured that the inflow of workers and their presence in the local communities do not create conflict in the surrounding communities. • Local community organisations and policing forums / neighbourhood watches must be informed of the presence of an outside workforce (where relevant).	**LOW**
Construction and operation activities of the Tower **Direct Impacts:** Employment Opportunities (positive) **Indirect Impacts:** Construction workers remaining in the larger area once this development has been completed. **Cumulative Impacts:** Construction workers remaining in the larger area once this development has been completed.	**LOW**	Enhancements: • The use of local labour should be maximised where possible. • Local people could be employed during the construction phase as Community Liaison officers. • Eskom and the appointed contractors should promote capacity building through skills development. • Eskom and the appointed contractors should create conditions that are conducive for the involvement of entrepreneurs, small businesses and SMME's during the construction and operational process. • Tender documentation should contain guidelines for the involvement of labour, entrepreneurs, businesses and SMME's from the local sector.	**MEDIUM**

NATURE OF POTENTIAL IMPACT/RISK	SIGNIFICANCE (WITHOUT MITIGATION)	PROPOSED MITIGATION	SIGNIFICANCE (WITH MITIGATION)
Construction and operation activities of the Tower **Direct Impacts:** Impact on Sense of Place **Indirect Impacts:** Possible negative visual change in the landscape character **Cumulative Impacts:** Possible impact on overall visual environment due to various the presence of the Tower infrastructure within the study area	**LOW**	• Construction sites should be screened from the property owners and mtorists where possible. • Stockpiling of soil should be as short as possible and construction debris should be removed as soon as construction activities allow. • Construction sites should be rehabilitated as soon as planning allows • Tower placements should preferably be as far from dwellings as possible	**LOW**

7.3 Do Nothing Alternative Assessment

No go Alternative (compulsory). This is the alternative of not developing the **Paulpietersberg Telecommunication** Radio Tower Within eDumbe Local Municipality. This alternative will result in limited construction impacts already occurring in the study area. The proposed telecommunication mast would serve as voice, data as well as other telecommunications and ancillary services for Eskom staff and contractors for the Duma Substation However, should the infrastructure not be developed as proposed, Eskom cannot provide this service to Transnet., in order for Eskom to provide the necessary communication services for its infrastructures it is imperative that there are reliable and effective communications systems in place to provide the necessary services to the substation. Services like tele-protection, tele-control, switched voice, direct voice and hot lines as well as data services like Ethernet connectivity. This is an undesirable alternative for the project as it will pose negative impacts from the social and economic perspective and is not considered desirable. The negative impacts of the no go alternative are considered to outweigh the positive impacts of this alternative. The no go alternative is therefore not preferred.

Table 9: Do Nothing Alternative Assessment

Potential impacts:	**Significance rating of impacts (positive or negative):**	**Proposed mitigation:**	**Significance rating of impacts after mitigation:**	**Risk of the impact and mitigation not being implemented**
Impact to possible wetland – No-go would mean study site status quo is maintained.	P – High	There are no mitigation measures	P – Low	Low risk
Impacts to terrestrial vegetation communities and habitat: Destruction and modification of the Primary Grassland habitat – No-go would mean study site status quo is maintained.	P – High	There are no mitigation measures	P – Medium	Low risk
Impacts to terrestrial biota / species (flora and fauna): Fauna displacement and/or flora and fauna fatalities – No-go would mean study site status quo is maintained.	P – Medium	There are no mitigation measures	P – Medium	Low risk
Potential increase in alien and invasive vegetation – No-go would mean study site status quo is maintained.	P – Medium	There are no mitigation measures	P – Medium	Low risk
Impacts to local and regional landscape ecological processes through Ecosystem fragmentation to Primary Grassland and Fauna displacement and/or fatalities – No-go would mean study site status quo is maintained.	P – Low	There are no mitigation measures	P – Low	Low risk

Contamination of fauna environment through use and storage of hazardous substances, littering and dumping of waste – No-go would mean study site status quo is maintained.	P – Low	There are no mitigation measures	P – Low	Low risk
Displacement of SCC and non-SCC priority species as a result of habitat loss & transformation – No-go would mean study site status quo is maintained.	P – Low	There are no mitigation measures	P – Low	Low risk
Potential collisions with proposed Duma RS tower – No-go would mean study site status quo is maintained.	P – Low	There are no mitigation measures	P – Low	Low risk
Loss and disturbance of heritage sites due to the development – No-go would mean study site status quo is maintained.	P – Low	There are no mitigation measures	P – Low	Low risk
Loss and disturbance to palaeontology due to the development – No-go would mean study site status quo is maintained.	P – Low	There are no mitigation measures	P – Low	Low risk
Visual – No-go would mean study site status quo is maintained.	P – Low	There are no mitigation measures	P – Low	Low risk
Dust generation – No-go would mean study site status quo is maintained.	P – High	There are no mitigation measures	P – High	Low risk
Crime, safety and security: during construction – No-go would imply that the area remains as is.	P – High	There are no mitigation measures	P – High	Low risk
Noise – No-go would imply no construction noise.	P – High	There are no mitigation measures	P – High	Low risk
Traffic and accessibility – No-go would imply no impact to traffic and accessibility.	P – Medium	There are no mitigation measures	P – Medium	Low risk
Pollution due to inappropriate handling of generated waste on site – No-go would mean study site status quo is maintained.	P – High	There are no mitigation measures	P – High	Low risk
Hazardous substance spillages anticipated during the operational period – No-go would mean study site status quo is maintained.	P – High	There are no mitigation measures	P – High	Low risk
Socioeconomic impacts anticipated during the construction period – No-go would mean no local job opportunities for general and skilled	N – High	The development of the substation will provide job opportunities for	N – High	High risk

labourers as well as no opportunities for local retailers.		locals and for local retailers.		
Socioeconomic impacts anticipated during the operational period – No-go would mean that overall community upliftment will not occur.	N – High	By providing electricity to the local communities in the area, overall upliftment in these areas will occur as a basic need is being met.	N – High	High risk

7.4 Cumulative Impacts Assessment

From a visual perspective, a risk of cumulative impacts is likely as the tower site is also shared with other existing towers. A denser cluster of towers will be present, thereby increasing the visual dominance of tower infrastructure and altering the horizon line. Cumulative impacts can be effectively reduced with the implementation of specific mitigation measures. Risk of obtrusive lighting: Red lights will be installed at the top and halfway down the tower. The specification for these lights is according to SACAA requirements and specify low intensity lights on each leg of the tower at a luminous intensity of 32cd. The night sky near the tower locations is already impacted by the presence of lights on the existing towers. The addition of more lights will cause a slight visual change, but no obtrusive lighting conditions will be created, therefore the risk of obtrusive lighting is very improbable. In addition, there is an inverse relationship between distance and light intensity - as the distance increases, light intensity decreases.

In terms of the avifauna, Potential cumulative impacts that could translate into population level impacts on affected populations of large birds, especially threatened species, are indeed of great relevance and concern here due to the widespread and accelerating proliferation of communication towers across the South African landscape. This renders the mitigation measures even more imperative. Potential cumulative impacts that could translate into population level impacts on affected populations of large birds, especially threatened species, are indeed of great relevance and concern here due to the widespread and accelerating proliferation of powerlines, including those servicing communication towers situated on highly sensitive elevated positions in the landscape, across the South African landscape. This renders the mitigation measures even more imperative.

From a **Fauna & Flora perspective** Under a worst-case scenario, there would be some degradation of the primary grassland type and less representative grassland for meeting conservation targets. Under a good mitigation scenario, the cumulative impacts should not be significant as long as the recommended mitigation measures are effectively implemented. **Negligible degradation of primary grassland type if the recommended mitigation measures are effectively implemented**

8 CONCLUSIONS AND RECOMMENDATIONS

The previous chapters of this report together with the specialist studies contained within **Appendix E** provide a detailed assessment of the potential impacts that may result from the proposed project. This chapter concludes the Basic Assessment Report for the proposed Towers by providing a summary of the conclusions of the assessment of the proposed powerline. In so doing, it draws on the information gathered as part of the BA process and the knowledge gained by the environmental specialist consultants and presents an informed opinion of the environmental impacts associated with the proposed project. Potential impacts which could occur as a result of the proposed project are summarised in the sections which follows.

8.1. Summary of Specialists findings

The specialist findings are summarised as follows:

Aquatic and Wetland Impact Assessment

Three (3) mountain headwater streams were identified and confirmed within 500m of the project site. These watercourses are unlikely to be impacted by the project activities for the following reasons i) The very small impact footprint and radius of worst-case indirect impacts of the tower project and ii) The large distance between the tower site and the three watercourses within 500m of the project. All were located >200m away from the project site.

Therefore, the project risks to aquatic and wetland ecosystems will be negligible. Nevertheless, in line with the requirements of the Department of Water and Sanitation (DWS), a risk assessment was done to formally confirm the low risk status of the project. All potential risks were assessed as being low under a good mitigation scenario.

Terrestrial Biodiversity (vegetation and Fauna)

The proposed tower will likely result in small, localised direct and indirect impacts to disturbed grassland partially representative of the endangered Paulpietersburg Moist Grassland type, and possibly a couple of individuals of a threatened plant species. All the potential impacts to the degraded and primary grassland and the threatened fauna were assessed as being of moderately-low significance under a poor mitigation scenario. With the effective implementation of the mitigation measures recommended, the significance of the impacts to the important grassland and threatened biota can be reduced to low. *In conclusion, provided that the mitigation measures recommended in this report are adhered to. It is unlikely that the proposed project activities will result in significant adverse impacts on terrestrial biodiversity in the long-term.*

Avifauna Impact Assessment

The proposed Paulpietersburg ALT RS tower assessed here is of avifaunal concern relevant to collisions. It is situated on a highly elevated and hence sensitive position in any area often subject to poor visibility due to low cloud and mist. This area supports threatened bird species vulnerable to collisions with such elevated structures and their associated infrastructure. EKZNW however have apparently not objected to this tower. It is situated in an existing tower farm and at 60 m is not particularly tall. The proposed structure should ideally be a tubular monopole rather than the planned lattice structure but this is not an issue of over-riding concern. The primary issue to be determined is whether the communication equipment can be co-located on an existing tower at the tower farm, which would remove any cause for significant concern. If a new tower does need to be constructed, and this need to convincingly demonstrated, it should be viewed as mandatory that this tower not have lateral support cables as

these present the greatest collision hazard to flying birds. Marking such cables with bird diverters should not be considered as comprising an adequate mitigation measure in these circumstances.

Agricultural Potential Impact

Although, the area has medium potential for agriculture based on the classification indicated in Figure 23, the agricultural value of the area is low due to lack of commercial agricultural productivity in the area. Therefore, based on the fact that the site has low agricultural productivity level, the land can be utilized for the proposed Paulpietersberg Tower construction. The area required (300 m) for constructing the tower will not have significant impact on the area available for agriculture.

Visual Assessment

Observers in the study area will be affected differently by the potential impacts, due to their distance away from the source of impact and their sensitivity towards their visual environment. Residents and tourists are considered the most sensitive observers if they are located within 2km from the source of impact, i.e., the Zone of Maximum Visual Exposure (ZMVE). A very small number of farm residents are located inside the ZMVE and are expected to have a greater visual exposure, but due to the relatively small visual change, a moderate/minor impact significance will be experienced. Tourists such as paragliders visiting the Dumbe Mountain will also have a much greater exposure to the source of impact. In both cases, the severity of impact is limited due to the small visual footprint of the tower. Residents and tourists outside the ZMVE are expected to experience a minor impact significance, mainly due to the distance factor considerably reducing the level of visual intrusion.

The landscape character will experience a transformation as a result of the denser cluster of tower infrastructure located on the mountain top. It will alter the horizon line. An inherent mitigating factor is to tower's slender, lattice structure that has a relatively small "visual footprint". The impact significance is expected to be moderate/minor.
Impacts can be marginally mitigated during the construction phase, but little can be done to mitigate impacts during the operational phase unless major design changes are considered. One such consideration is the avoidance of a new tower and the co-locating of the telecommunication radios on an existing tower. This is subject to technical and cost-benefit scrutiny by the applicant. An equally effective mitigation measure is the construction of the proposed tower, as well as negotiations with other service providers to dismantle their towers and co-locating services on the new tower. These are considered the most effective mitigation measure to address the potential impacts. No fatally flawed issues are identified.

Heritage & Palaeontological Assessment:

This report describes the methodology used, the limitations encountered, the heritage features that were identified and the recommendations and mitigation measures proposed relevant to this. It should be noted that the implementation of the mitigation measures is subject to SAHRA/PHRA's approval.
The area in which the development of the tower will take place can be described as a slowly evolving farming landscape. During the survey no sites, features or objects of cultural heritage significance were identified in the project area. Impact analysis of cultural heritage resources under threat of the proposed development, is based on the present understanding of the development: For the current study, as no sites, features or objects of cultural significance were identified, no mitigation measures are proposed. The alternatives are rated as being either preferred, not

Social-Economic Impact Assessment

The majority of the negative social impacts anticipated are of a low significance and are anticipated to respond to mitigation. Even though the impacts are thus of importance, mitigation could reduce the negative impacts to acceptable levels.

Although negative social impacts would be experienced, the necessary electrical input into the Transnet railway system is vital. In response to the increased demand for South Africa's coal in the global market place, Transnet needs to increase the volume of coal that is being transported between the Mpumalanga coal fields and the Richard's Bay Coal Terminal. This increase will be facilitated through capital expenditure on two fronts, the supporting infrastructure, i.e. the electrical network supplying the locomotives and the locomotives themselves. In order for Transnet to accomplish the above they need to upgrade their power supply to their various traction substations between Ermelo and Richards Bay to facilitate the introduction of the new, larger locomotives that will be added to increase the volume of coal being transported and exported

8.2. Summary of Impacts

A summary of the impact assessments is presented in **Table 10**; the tables cover the construction and operational impacts. An overall weighted score is provided in each case. Thus far each of the environmental issues are assigned equal weighting (I.e. the weighted score is the average of each of the individual scores. The impact scores are also colour coded according to the following:

< 30	**Low significance**
30 to 60	**Moderate significance**
>60	**High significance**

It must be noted that the impact scores in Table 10 below are not intended to be definitive measures of environmental impact, but they are a useful guide to evaluating the overall environmental performance of a new development and they assist in interpreting key influences of a development

Table 10: Impact Summary table

CONSTRUCTION PHASE		
Environmental Aspect	**Without Mitigation**	**With Mitigation**
Aquatic and Wetland Impact Assessment		
Physical Disturbance, Erosive water and/ or eroded sediment and Pollutants	Low	Low
Terrestrial Biodiversity Impact		
Impacts to terrestrial vegetation communities and habitat o Direct ecosystem destruction and modification impacts o Indirect ecosystem disturbance impacts	Medium	Low
Impacts to terrestrial biota / species	Medium	Low
Impacts to local and regional landscape ecological processes	Low	Low
Avifauna Impact		
Displacement of SCC and non-SCC priority species as a result of disturbance.	Medium	Low
Heritage & Palaeontological Assessment		
Destruction, Damage & Loss of fossil material	Low	Low
Visual Impacts		

Severity of impacts on observers (OB) i.e. Residents and Tourists inside ZMVE inside Zone of Maximum Visual Exposure (ZMVE)	Medium	Low
Severity of impacts on observers (OB) (i.e. Residents & tourist outside ZMVE & Motorist)	Low	Low
Severity of impacts on the Landscape character (LC)	Medium	Low
Agriculture Potential Impact		
Loss of agricultural land	Low	Low
Social Impacts		
Inflow of Workers	Low	Low
Employment Opportunities (positive)	Medium	Low
Impact on Sense of Place	Low	Low
OPERATIONAL PHASE		
Environmental Aspect	**Without Mitigation**	**With Mitigation**
Aquatic and Wetland Impact Assessment		
Physical Disturbance, Erosive water and/ or eroded sediment and Pollutants	Low	Low
Terrestrial Biodiversity Impact		
Impacts to terrestrial vegetation communities and habitat ○ Direct ecosystem destruction and modification impacts ○ Indirect ecosystem disturbance impacts	Medium-Low	Low
Impacts to terrestrial biota / species	Medium	Low
Impacts to local and regional landscape ecological processes	Low	Low
Avifauna Impact		
• Potential collisions with the Towers	Medium	Low
• Potential hazard from servicing powerline	Medium	Low
Heritage & Palaeontological Impact		
Direct or physical impacts, implying alteration or destruction of heritage features (Greenfield VGF 1 & Greenfield 3A Tower)	Low	Low
Loss or damage to sites, features or objects of cultural heritage significance	Low	Low
Visual Impacts		
• Severity of impacts on observers (OB) and landscape character (LC)	Medium	Low
Agriculture Potential Impact		
Loss of agricultural production	Low	Low
Social Impacts		
Impact on Land Use and Future Developments	Low	Low
Impact on Property Values	Low	Low
Impact on Sense of Place	Low	Low

8.3. Environmental Sensitivity Mapping

From the conclusions of the detailed studies undertaken, sensitive areas within the site were identified and flagged for consideration and avoidance (where possible) by the final position of the tower. The following high sensitive areas/environmental features as shown in **Figure 24** have been identified on the site:

- Vegetation sensitivity: The disturbed grassland within the study area has lost much of its natural species richness and is only partially representative of the endangered Paulpietersburg Moist Grassland. This community also hosts red data plant species. This vegetation community is thus considered of **moderate** importance and sensitivity.
- *Moraea graminicola* subsp. *graminicola* Protected and red listed plants within 100m of the tower site.
- Visual Receptors of High Sensitivity:
    - Tourists are generally classified as observers with a **high sensitivity** when their reason for visiting the area is focussed on enjoying the visual quality and engaging in outdoor activities that are offered by the study area's natural landscape.
    - Residents the study area are generally classified as visual receptors of high sensitivity owing to their sustained visual exposure and attentive interest towards their living environment. The highest concentration residents are present in Paulpietersburg and Dumbe, who will be the closest to the tower, but outside of the ZMVE. The surrounding farms are sparsely populated and spread out with a few farmsteads located inside the ZMVE, but most falling outside the ZMVE.

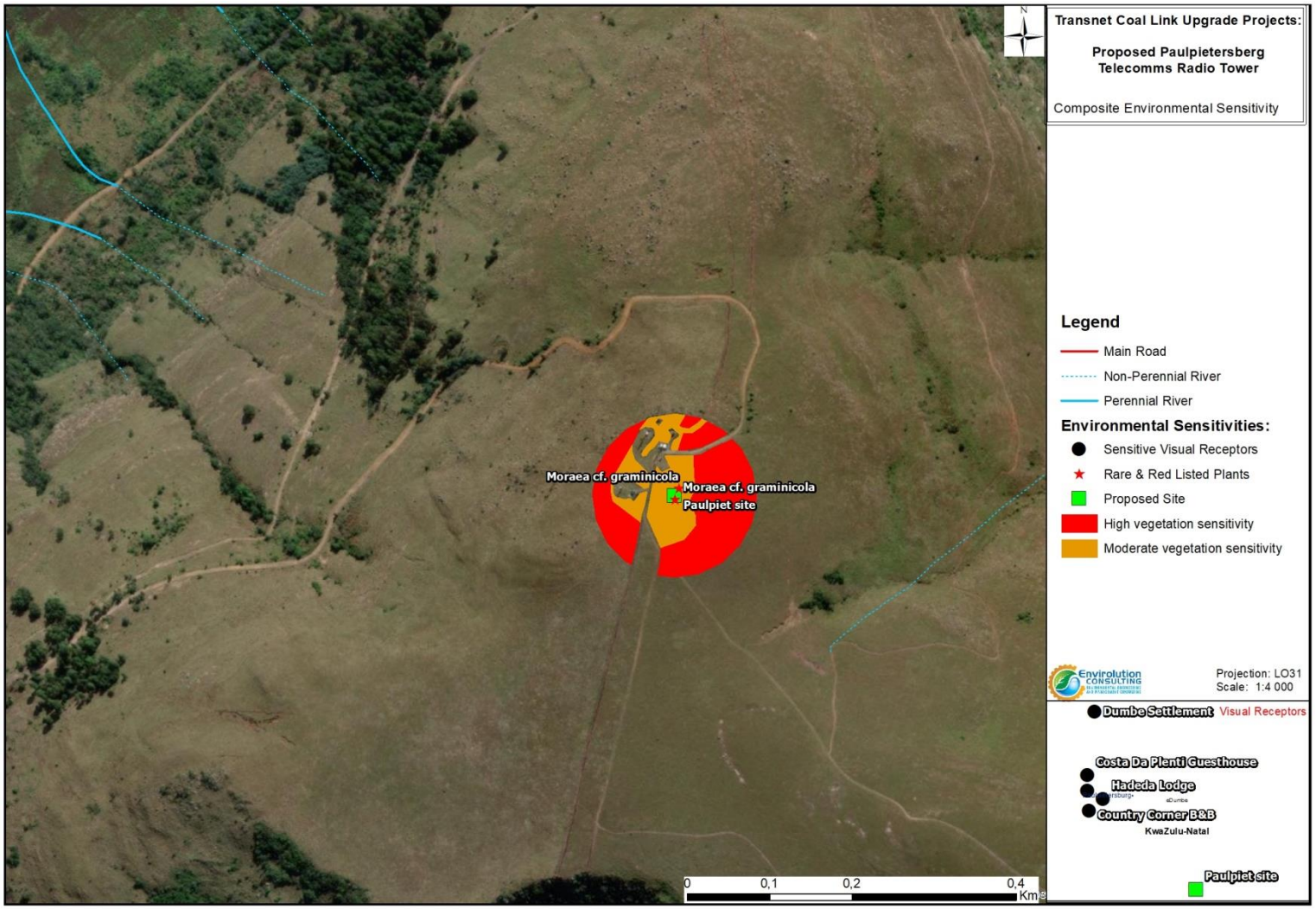

Figure 24:: Composite Environmental Sensitivity Map for the proposed Paulpietersburg Telecommunication Radio Tower showing areas of high sensitivity.

8.4. Conclusion (Impact Statement)

As summarised in Table 10, it's been noted that the majority of the negative impacts associated with the construction of the proposed Paulpietersburg Telecommunication Radio Tower are short-term (i.e. during the construction phase), **majority of the negative impacts identified can be mitigated to low significance** if all mitigation measures identified and included in the Environmental Management Programme (EMPr) attached in Appendix F. Owing to the fact that the project is for the provision of the requirement to serve as voice, data as well as other telecommunications and ancillary services for Eskom staff and contractors which are meant to improve service levels and efficiencies to ensure volume growth, to meet core telecommunication specifications in support of maintenance standards, most of the impacts resulting from the project aspects are anticipated to be positive more so in the long-term of the implementation of the project, these benefits of the project are expected to occur beyond the local area therefore the benefits partially offset the localised environmental costs of the project.

The most significant impact flagged is the tower collision mortality risk posed to threatened bird species as the project is situated on a highly elevated ground and hence sensitive position in any area often subject to poor visibility due to low cloud and mist. The specialist has proposed two mitigation actions to reduce the potential impacts by i) co-locating the new communication equipment on existing towers at the site, and ii) if this is not possible, that no lateral support cable be used in the tower design.

According to Eskom technical team, the two proposed mitigations are not technically feasible: Sharing with existing third party sites are not suitable due to the fact that the communication network that Eskom is providing is to monitor and control the power grid/system and it is imperative that this system is secure, safe and in control of Eskom to maintain and perform it duties when called upon to do so. Eskom cannot rely on third party should an emergency situation arise and Eskom personnel is required to access the site. Usually, building a site close or next to a third part site was also considered but found not suitable due mainly to having no LOS to existing sites. However, the proposed structure will be situated in an existing tower farm and at 60 m which is not particularly tall; in an attempt to mitigate some foreseen impacts. *On the second point, Eskom have moved away from monopoles structures, this type as it is very difficult to maintain during its lifetime. In addition, Eskom doesn't have access to well proven technology in SA to ascertain the technical properties of the structure over its lifespan due to degradation that may occur due to any external factors. Eskom has also found that Lattice structures are more robust and durable for their network needs.*

The findings this report indicate that there are no significant environmental fatal flaws associated with the proposed development, the majority of the negative impacts associated with the project are minor, the positive impacts outweigh the negatives considerably and thus, with the application of effective mitigation measures, the proposed project is regarded to be feasible and sustainable. Environmental constraints as listed on section 8.3 and shown in the environmental sensitivity map (**Figure 24**) includes are features that could be avoided during the detail design phase of the project, by careful placing of tower footprint. Responsible environmental management will be required on site, during the planning and construction phases of the project. It is therefore the **opinion of the EAP that the proposed development could proceed** as all impacts identified are localised and manageable provided that the mitigation measures set out in this report (refer to section 8.5) and in the EMPr (Appendix F) are diligently implemented to limit the potential impacts on sensitive ecological and visual aspects of the project during construction and operation of the development.

8.5. Recommendations

The **EAP recommends** that the **construction of the proposed Paulpietersburg Telecommunication Radio Tower be authorised**. The construction activities and relevant rehabilitation of disturbed areas should be monitored against the approved EMPr, the Environmental Authorisation, specialist report recommendations and all other relevant environmental legislation. The following relevant **conditions would be required** to be included within an authorisation issued for the project.

- An independent Environmental Control Officer (ECO) should be appointed to monitor compliance with the specifications of the EMPr for the duration of the construction period.
- Security lighting for on-ground facilities, equipment, and infrastructure should be avoided. If not possible, lighting should be motion or heat-sensitive, down-shielded, and of a minimum intensity to reduce night-time bird attraction and eliminate constant night-time illumination while still allowing safe night-time access to the site.
- Creation of new access roads should be minimised as far as possible. Rock outcrop habitats must be avoided by access / service roads
- Stormwater Management Plan is established for the Service Road. All erosion protection measures must be established to reflect the natural slope of the surface and located at the natural ground-level.
- Threatened and Protected Plant Search and Rescue: Prior to construction commencing, the following must be undertaken:
    - The protected *Moraea* individuals within and in the vicinity of the development footprint must be relocated to the primary grassland areas downslope by a person with suitable horticultural experience, and in particular experience in relocating indigenous plants within natural habitats. The translocation should occur in mid-summer to ensure that all individuals are picked up during the relocation.
    - Permits to translocate such species must be acquired and a search and rescue plan must be compiled and implemented.
- A detailed method statement for the construction activities within all primary grasslands must be compiled and appended to the construction (EMPr) prior to construction commencing. The final method statement must be reviewed by the ECO prior to commencement and must include all measures provided in this section where relevant and applicable
- Demarcation of 'No-Go' areas and construction corridors
- Should any archaeological artefacts be exposed during excavation, work on the area where the artefacts were found, shall cease immediately and the ECO shall be notified as soon as possible. Any archaeological sites exposed during construction activities may not be disturbed prior to authorisation by the South African Heritage Resources Agency.
- All relevant practical and reasonable mitigation measures detailed within this report and within the EMPr must be implemented. The implementation of this EMPr for all life cycle phases of the proposed project is considered key in achieving the appropriate environmental management standards as detailed in this report
- All declared alien plants must be identified and managed in accordance with the Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983). The implementation of a monitoring programme in this regard is recommended.
- Care must be taken with the topsoil during and after construction on the site. If required, measures to reduce erosion to be employed until a healthy plant cover is again established.
- Contractors must be informed before construction starts on the possible types of heritage sites and cultural material they may encounter and the procedures to follow when they find sites.
- The developer should obtain all necessary permits prior to the commencement of construction.

- On-going monitoring of the development sites must be undertaken to detect and restrict the spread of alien plant species.

9 APPENDICES

Appendix A: Maps

- Appendix A1: Locality Maps
- Appendix A2: Sensitivity Maps
- Appendix A3: Composite Environmental Sensitivity Map

Appendix B: Facility illustration(s)

Appendix C: **DFFE Correspondence**

Appendix D: Public Participation Process

- Appendix D1: Proof of Site Notice
- Appendix D2: Proof of newspaper advertisements
- Appendix D3: Written Notifications
- Appendix D4: Previous Correspondences with I&APs
- Appendix D5: Comments from I&APs on Draft Report
- Appendix D6: Minutes of meetings
- Appendix D7: Comments and Responses Report
- Appendix D8: List of registered I&Aps

Appendix E: Specialist reports

- Appendix E1: Aquatic and Wetland Impact Assessment
- Appendix E2: Terrestrial Ecological Impact Assessment
- Appendix E3: Avifauna Impact Assessment
- Appendix E4: Heritage Impact Assessment
- Appendix E5: Palaeontological (Desk-Top) Impact Assessment:
- Appendix E6: Visual Impact Assessment
- Appendix E7: Agriculture Potential Assessment

Appendix F: Environmental Management Programme (EMPr)

Appendix G: Additional Information

- Appendix G1: Details of EAP (and expertise) and affirmation
- Appendix G2: Specialist's declaration of interest
- Appendix G3: Screening Report