Appendix D2

Visual Impact Assessment Report

VISUAL IMPACT REPORT

UMZINTO NORTH
TELECOMMUNICATIONS MAST
BASIC ASSESSMENT
MARCH 2023

VISUAL IMPACT REPORT

SBA Towers (Pty) Ltd Umzinto North Telecommunications Mast, Kwa Zulu Natal

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ACRONYMS, ABBREVIATIONS AND GLOSSARY

Acronyms & Abbreviations	
BAR	Basic Assessment Report
EIA	Environmental Impact Assessment
EMPr	Environmental Management Programme
GYLA	Graham Young Landscape Architect
MAST	Overhead Line
SACLAP	South African Council for the Landscape Architectural Profession
VAC	Visual Absorption Capacity
VIA	Visual Impact Assessment
Glossary	
Aesthetic Value	Aesthetic value is the emotional response derived from the experience of the environment with its natural and cultural attributes. The response can be either to visual or non-visual elements and can embrace sound, smell and any other factor having a strong impact on human thoughts, feelings, and attitudes (Ramsay, 1993). Thus, aesthetic value encompasses more than the seen view, visual quality, or scenery, and includes atmosphere, landscape character and sense of place (Schapper, 1993).
Aesthetically significant place	A formally designated place visited by recreationists and others for the express purpose of enjoying its beauty. For example, tens of thousands ofpeople visit Table Mountain on an annual basis. They come from around the country and even from around the world. By these measurements,one can make the case that Table Mountain (a designated National Park) is an aesthetic resource of national significance. Similarly, a resource thatis visited by large numbers who come from across the region probably has regional significance. A place visited primarily by people whose place of origin is local is generally of local significance. Unvisited places either have no significance or are "no trespass" places. (After New York, Department of Environment 2000).
Aesthetic impact	Aesthetic impact occurs when there is a detrimental effect on the perceived beauty of a place or structure. Mere visibility, even startling visibility of a Project proposal, should not be a threshold for decision making. Instead, a Project, by its visibility, must clearly interfere with or reduce (i.e., visual impact) the public's enjoyment and/or appreciation of the appearance of a valued resource e.g., cooling tower blocks a view from a National Park overlook (after New York, Department of Environment 2000).
Cumulative Effects	The summation of effects that result from changes caused by a development in conjunction with the other past, present, or reasonably foreseeable actions.
Glare	The sensation produced by luminance within the visual field that is sufficiently greater than the luminance to which the eyes are adapted, which causes annoyance, discomfort, or loss in visual performance and visibility. *See* Glint. (USDI 2013:314)
Glint	A momentary flash of light resulting from a spatially localized reflection of sunlight. *See* Glare. (USDI 2013:314)
Landscape Character	The individual elements that make up the landscape, including prominent or eye-catching features such as hills, valleys, woods, trees, water bodies, buildings, and roads. They are generally quantifiable and can be easily described.

Landscape Impact	Landscape effects derive from changes in the physical landscape, whichmay give rise to changes in its character and how this is experienced (Institute of Environmental Assessment & The Landscape Institute 1996).
Study area	For the purposes of this report this Project the study area refers to the proposed Project footprint / Project site as well as the 'zone of potential influence' (the area defined as the radius about the centre point of the Project beyond which the visual impact of the most visible features will be insignificant) which is a 5,0km radius surrounding the proposed Project footprint / site.
Project Footprint / Site	For the purposes of this report the Project *site / footprint* refers to theactual layout of the Project as described.
Sense of Place (Genius loci)	Sense of place is the unique value that is allocated to a specific place or area through the cognitive experience of the user or viewer. *A genius locus literally means* 'spirit of the place'.
Sensitive Receptors	Sensitivity of visual receptors (viewers) to a proposed development.
Viewshed analysis	The two-dimensional spatial pattern created by an analysis that defines areas, which contain all possible observation sites from which an object would be visible. The basic assumption for preparing a viewshed analysis is that the observer eye height is 1,8m above ground level.
Visibility	The area from which Project components would potentially be visible.Visibility depends upon general topography, aspect, tree cover or other visual obstruction, elevation, and distance.
Visual Exposure	Visibility and visual intrusion qualified with a distance rating to indicate the degree of intrusion and visual acuity, which is also influenced by weatherand light conditions.
Visual Impact	Visual effects relate to the changes that arise in the composition of available views because of changes to the landscape, to people's responses to the changes, and to the overall effects with respect to visual amenity available views because of changes to the landscape, to people's responses to the changes, and to the overall effects with respect to visualamenity.
Visual Intrusion	The nature of intrusion of an object on the visual quality of the environment resulting in its compatibility (absorbed into the landscape elements) or discord (contrasts with the landscape elements) with the landscape and surrounding land uses.
Visual absorption capacity	Visual absorption capacity is defined as the landscape's ability to absorb physical changes without transformation in its visual character and quality. The landscape's ability to absorb change ranges from low- capacity areas, in which the location of an activity is likely to cause visual change in the character of the area, to high-capacity areas, in which the visual impact of development will be minimal (Amir & Gidalizon 1990).
Worst-case Scenario	Principle applied where the environmental effects may vary, for example, seasonally or collectively to ensure the most severe potential effect isassessed.
Zone of Potential Visual Influence	By determining the zone of potential visual influence, it is possible to identify the extent of potential visibility and views which could be affected by the proposed development. Its maximum extent is the radius around an object beyond which the visual impact of its most visible features will be insignificant primarily due to distance.

EXECUTIVE SUMMARY

Project Site and Study Area

EnviroAfrica CC has been appointed by SBA Towers to manage the process of applying for an environmental authorisation. The Umzinto telecommunications mast of approximately 45m in height and associated structures and infrastructure is proposed on Erf 33, Umzinto North, Umdoni Local Municipality, Ugu District DC 21. The telecommunications mast and associated base station structures and infrastructure will have a development footprint of approximately 100m^2. Eco-Thunder Consulting was commissioned by EnviroAfrica CC to carry out a Visual Impact Assessment (VIA) of the proposed telecommunication mast.

An active sugarcane farm exists on Erf 33, Umzinto North and proposed site is located within a sugarcane field that has been transformed from its natural state by yearly sugarcane growing and harvesting activities. The site is proposed in an area which is mostly untransformed and aesthetically pleasing with natural features which is significant to the area. The cellular mast will be visible to all surrounding landowners who live within a close proximity to the proposed mast.

The VIA focuses on the potential impact of the physical aspects of the proposed developments (i.e., form, scale, and bulk), and their potential impact within the local landscape and receptor context.

The general requirement is a 45m tapered steel lattice tower with either a square or triangular base. The masts shall be painted red and white and shall have a Direct Current (DC) powered navigation light on top. The proposed telecommunications mast is sheltered to some degree by the topography of the landscape.

Commented [CP1]: Client to confirm

For the purposes of conducting the VIA, guidance has been taken from the Provincial Government the Western Cape, Department of Environmental Affairs and Development Planning (DEA&DP) Guideline for Involving Visual and Aesthetic Specialists in the EIA Process (Oberholzer, 2005).

Approach to Study

The VIA is determined according to the nature, extent, duration, intensity or magnitude, probability, and significance of the potential visual impacts, and will propose management actions and/or monitoring programs and may include recommendations related to the proposed mast.

The visual impact is determined for the highest impact-operating scenario (worst-case scenario) and varying climatic conditions (i.e., different seasons, weather conditions, etc.) are not considered.

The VIA considers potential cumulative visual impacts, or alternatively the potential to concentrate visual exposure/impact within the region.

The determination of the potential visual impacts is undertaken in terms of nature, extent, duration, magnitude, probability and significance of the construction and operation of the proposed infrastructure.

Anticipated issues related to the potential visual impact of the proposed development include the following:

- The visibility of the facility to, and potential visual impact on, observers travelling along the major local roads traversing south and west of the proposed facility.
- The visibility of the facility to, and visual impact on, the larger built-up centres or populated places as well as the homesteads (farm residences) located within close proximity of the site.
- Potential cumulative visual impacts (or alternately, consolidation of visual impacts) with specific reference to the existing power line infrastructure adjacent to the proposed development area.
- The potential visual impact of the construction of ancillary on observers in close proximity of the facility.
- The potential visual impact of operational, safety and security lighting of the facility at night on observers residing in proximity of the facility.
- The visual absorption capacity of natural or planted vegetation (if applicable).
- Potential visual impacts associated with the construction phase.

- The potential to mitigate visual impacts and inform the design process.

It is envisaged that the issues listed above may constitute a visual impact at a local scale.

Conclusion

Accommodate change from a particular development, without detrimental effects on its character" (GLVIA, 2002). The uncluttered openness of the landscape is greatly responsible for the simplistic and essentially secluded landscape character. Vast uninterrupted landscapes and vistas are dominated by low growing and low stunted vegetation. The unspoilt, panoramic landscape is an amenity that greatly contributes to the pristine and remote character of the landscape.

Previous human induced activities and interventions have minimally impacted the original landscape character. In this case, existing infrastructure, including power lines, roads, amongst others, can be classified as landscape disturbances and elements that cause a reduction in the condition of the affected landscape type and negatively affect the quality of the visual resource.

The significance of visual impact is based on the worst-case scenario This assumption is also based on the nature of the visual impact and the fact that receptors would experience all facilities in the same visual envelope from their respective locations or as they travel along adjacent roads.

The anticipated visual impact is not considered to be a fatal flaw from a visual perspective, considering the low incidence of visual receptors occurring within the region.

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1. INTRODUCTION

1.1. Project Overview and Background

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An active sugarcane farm exists on Erf 33, Umzinto North and proposed site is located within a sugarcane field that has been transformed from its natural state by yearly sugarcane growing and harvesting activities. The site is proposed in an area which is mostly untransformed and aesthetically pleasing with natural features which is significant to the area. The cellular mast will be visible to all surrounding landowners who live within a close proximity to the proposed mast.

The VIA focuses on the potential impact of the physical aspects of the proposed developments (i.e., form, scale, and bulk), and their potential impact within the local landscape and receptor context.

The general requirement is a 45m tapered steel lattice tower with either a square or triangular base. The masts shall be painted red and white and shall have a Direct Current (DC) powered navigation light on top. The proposed telecommunications mast is sheltered to some degree by the topography of the landscape.

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1.2. Project site and study area

The development is located in Umzinto North in the Umdoni Local Municipality. The Ugu DM (district code DC21) is a Category C municipality situated in the south of KZN. The district is bordered by Umgungundlovu District Municipality (DM) (north), eThekwini Municipality (north-east), Harry Gwala DM (west) and the Eastern Cape (south-west). The Indian Ocean forms the eastern border of the district.

The study area consists of vacant and uninterrupted land as well as cultivated, residential, subsistence farming, and the Vernon Crook Nature reserve. Sugarcane farming activities are concentrated around the small towns with several drainage lines crisscrossing the area, including a non-perennial water course that runs past the site itself and the nearest residential area is 380m to the south-east of the site.

Human settlements are scattered throughout the study area and the landscape is degraded around these settlements. Landscape types are distinguished by differences in topographical features, vegetation communities and patterns, land use and human settlement patterns. The assessment is done on a macro-scale and discusses the predominant landscape conditions and visual characteristics found in a particular landscape type.

The Vernon Crook reserve conserves a representative and well managed example of the coastal grasslands and coastal forest habitats of southern KwaZulu-Natal, and the biodiversity that these habitat types support. Boasting a wide variety of different habitats, including scarp forest, extensive grasslands, rivers, wetlands, cliff faces, and dams which provide a haven and shelter for a wide variety of wildlife which exist in the reserve.

Named after the Mzinto River, Umzinto is located on the Umdoni Coast in KwaZulu Natal, South Africa. The planters and millers started growing cane on the hilly terrain around the Mzinto River from 1857. Today however, Umzinto remains a busy town with a mixture of colonial and Indian architecture.

1.3. Objective of the Specialist Study

The main aim of the study is to document the baseline and to ensure that the visual/aesthetic consequences of the proposed Project are understood. The report therefore aims to identify scenic resources, and visually sensitive areas or receptors. It also aims to identify key concerns or issues relating to potential visual impacts arising from the Project, and which must be addressed in the assessment phase.

The DEA&DP guideline suggests various triggers for conducting a Visual Impact Assessment (VIA). With respect to the proposed Telecommunication Mast, a number of aspects of the development that would suggest the need for a VIA. These include:

- Areas lying outside a defined urban edge line;
- A significant change to the townscape or streetscape;
- Possible visual intrusion in the landscape; and
- Obstruction of views of others in the area. The purpose of conducting a VIA is to determine:
- The visibility of the proposed project;
- The potential visual impact on visual/scenic resources;
- The nature, extent, duration, magnitude, probability and significance of impacts, as well as measures to mitigate negative impacts and enhance benefits; and
- The character and visual absorption capacity of the landscape.

1.4. Terms and Reference

A specialist study is required to establish the visual baseline and to identify and potential visual impacts arising from the proposed development based on the general requirements for a comprehensive VIA. The following terms of reference were established:

- Data collected allows for a description and characterization of the receiving environment.
- Describe the landscape character, quality and assess the visual resource of the study area.
- Describe the visual characteristics of the components of the Project.
- Identify issues that must be addressed in the impact assessment phase.
- Propose mitigation options to reduce the potential impact of the Project.

1.5. Specialist Details

Eco-Thunder Consulting (ETC) is a 100% woman-owned, private company that specializes in a range of specialist studies, such as Visual Impact Assessments, socio-economic research, economic development planning, development programme design and implementation as well as community trust management.

Eco-Thunder Consulting is registered with ECSA with interest and experience in landscape architecture, urban design, and environmental planning. The company has carried out visual impact assessments throughout Africa and specialize in project optimization in the environmental space. Aspects of this work also include landscape characterization studies, end-use studies for quarries, and computer modelling and visualization.

Based in Johannesburg, South Africa, Eco-Thunder has established itself as an expert on the conditions, needs and assets of communities that are linked to independent power generation facilities.

ETC also implements development programmes in energy communities, which ensures a comprehensive understanding of the how to drive positive social impact.

1.6. Level of Confidence

Level of confidence[1] is determined as a function of:

- The information available, and understanding of the study area by the practitioner:

[1] Adapted from Oberholzer (2005).

- 3: A high level of information is available of the study area and a thorough knowledge base could be established during site visits, surveys etc. The study area was readily accessible.
- 2: A moderate level of information is available of the study area and a moderate knowledge base could be established during site visits, surveys etc. Accessibility to the study area was acceptable for the level of assessment.
- 1: Limited information is available of the study area and a poor knowledge base could be established during site visits and/or surveys, or no site visit and/or surveys were carried out.

- The information available, understanding of the study area and experience of this type of project by the practitioner:
  - 3: A high level of information and knowledge is available of the project and the visual impact assessor is well experienced in this type of project and level of assessment.
  - 2: A moderate level of information and knowledge is available of the project and/or the visual impact assessor is moderately experienced in this type of project and level of assessment.
  - 1: Limited information and knowledge is available of the project and/or the visual impact assessor has a low experience level in this type of project and level of assessment.

The level of confidence for this assessment is determined to be **9** and indicates that the author's confidence in the accuracy of the findings is high:

- The information available, and understanding of the study area by the practitioner is rated as **3** and
- The information available, understanding and experience of this type of project by the practitioner is rated as **3**.

1.7. Assumptions, Uncertainties, and Limitations

The following assumptions and limitations have been made in the study:

- The assessment has been based on the requirements of the Western Cape Guidelines.
- Whilst the majority of homesteads and housing areas were visited during the site visit in order to confirm their nature and likely visibility of the development, it was not possible to visit all homesteads and housing areas.
- The description of project components is limited to what has been supplied to the author before the date of completion of this report.
- The Project report uses the concept of 'worst case scenario' to identify issues and rate visual impacts. This scenario assumes that all facilities along with the associated mast infrastructure and sub-stations would be constructed at the same time. At the time of writing there was no evidence to the contrary. This assumption is also based on the nature of visual impact and the fact that receptors would experience all facilities with in the same visual envelope from their respective locations or as they travel along adjacent roads.
- The assessment of cumulative impacts is partly based on information provided by the DFFE Website .

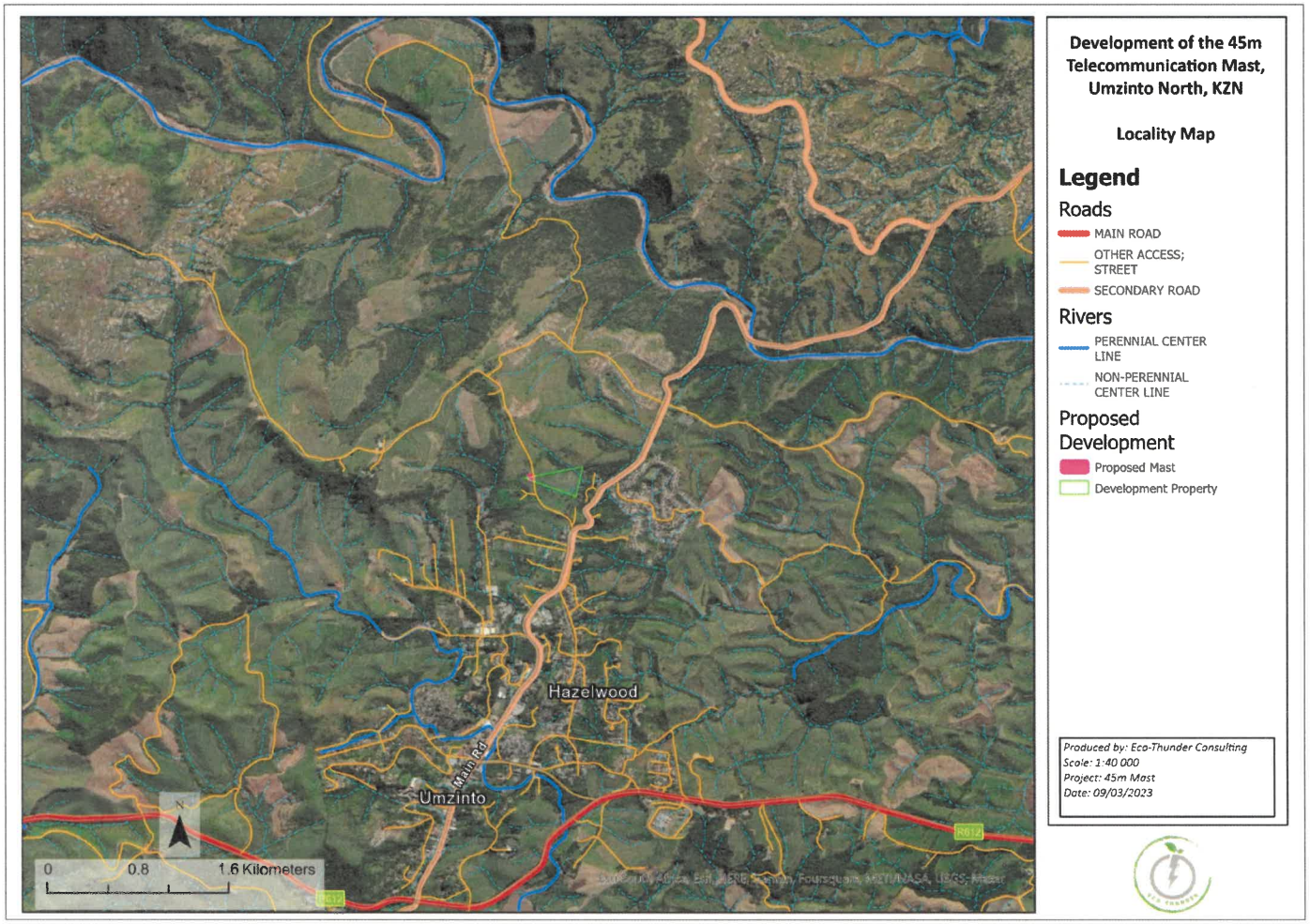

Figure 1: Proposed Development location map

2. LEGAL REQUIREMENTS AND GUIDELINES

This report adheres to the following legal requirements and guideline documents.

2.1. National Legislation and Guidelines

National Environmental Management Act (Act 107 of 1998), EIA Regulations

The specialist report is in accordance with the specification on conducting specialist studies as per Government Gazette (GN) R 982 of the National Environmental Management Act (NEMA) Act 107 of 1998. The mitigation measures as stipulated in the specialist report can be used as part of the Environmental Management Programme (EMPr) and will be in support of the Environmental Impact Assessment (EIA) and Appendix 6 of the EIA Regulations 2014, as amended on 7 April 2017.

Specialist Screening Protocols are also required by the 2014 EIA Regulations. These were taken into consideration for each of the five projects. However, the Landscape Theme Sensitivity was referenced as there is no specific 'visual' protocol.

Western Cape Department of Environmental Affairs & Development Planning: Guideline for Involving Visual and Aesthetic Specialists in EIA Processes Edition 1 (CSIR, 2005)

Although the guidelines were specifically compiled for the Province of the Western Cape[4], they provide guidance that is appropriate for any EIA process. The Guideline document also seeks to clarify instances when a visual specialist should get involved in the EIA process.

[4] The Western Cape Guidelines are the only official guidelines for visual impact assessment reports in South Africa and can be regarded as best practice throughout the country.

3. APPROACH AND METHODOLOGY

3.1. Approach

VIAs become more critical where wilderness or protected landscapes are involved, as well as when high density urban development or large-scale infrastructure are being considered. The project area is considered in this report to be of low scenic, cultural or historical significance and the surrounding areas have been disturbed. Based on the figures 2 and 3 below, it is deemed that a "Moderate Visual Impact" is expected for the proposed telecommunication mast.

Category 1 development:
e.g. nature reserves, nature-related recreation, camping, picnicking, trails and minimal visitor facilities.

Category 2 development:
e.g. low-key recreation / resort / residential type development, small-scale agriculture / nurseries, narrow roads and small-scale infrastructure.

Category 3 development:
e.g. low density resort / residential type development, golf or polo estates, low to medium-scale infrastructure.

Category 4 development:
e.g. medium density residential development, sports facilities, small-scale commercial facilities / office parks, one-stop petrol stations, light industry, medium-scale infrastructure.

Category 5 development:
e.g. high density township / residential development, retail and office complexes, industrial facilities, refineries, treatment plants, power stations, wind energy farms, power lines, freeways, toll roads, large-scale infrastructure generally. Large-scale development of agricultural land and commercial tree plantations. Quarrying and mining activities with related processing plants.

Figure 2: Types of Categories for Developments

Type of environment	Type of development / Low to high intensity				
	Category 1 development	Category 2 development	Category 3 development	Category 4 development	Category 5 development
Protected/wild areas of international, national, or regional significance	Moderate visual impact expected	High visual impact expected	High visual impact expected	Very high visual impact expected	Very high visual impact expected
Areas or routes of high scenic, cultural, historical significance	Minimal visual impact expected	Moderate visual impact expected	High visual impact expected	High visual impact expected	Very high visual impact expected
Areas or routes of medium scenic, cultural or historical significance	Little or no visual impact expected	Minimal visual impact expected	Moderate visual impact expected	High visual impact expected	High visual impact expected
Areas or routes of low scenic, cultural, historical significance / disturbed	Little or no visual impact expected Possible benefits	Little or no visual impact expected	Minimal visual impact expected	Moderate visual impact expected	High visual impact expected
Disturbed or degraded sites / run-down urban areas / wasteland	Little or no visual impact expected Possible benefits	Little or no visual impact expected Possible benefits	Little or no visual impact expected	Minimal visual impact expected	Moderate visual impact expected

Figure 3: Visual Impact based on type of environment vs development category

Very high visual impact expected:
Potentially significant effect on wilderness quality or scenic resources;
Fundamental change in the visual character of the area;
Establishes a major precedent for development in the area.

High visual impact expected:
Potential intrusion on protected landscapes or scenic resources;
Noticeable change in visual character of the area;
Establishes a new precedent for development in the area.

Moderate visual impact expected:
Potentially some effect on protected landscapes or scenic resources;
Some change in the visual character of the area;
Introduces new development or adds to existing development in the area.

Minimal visual impact expected:
Potentially low level of intrusion on landscapes or scenic resources;
Limited change in the visual character of the area;
Low-key development, similar in nature to existing development.

Little or no visual impact expected:
Potentially little influence on scenic resources or visual character of the area;
Generally compatible with existing development in the area;
Possible scope for enhancement of the area.

Figure 4: Description of the key categories of visual impact expected

The effects of the development on a landscape resource and visual amenity are complex since it is determined through a combination of quantitative and qualitative evaluations. When assessing visual impact,the worst-case scenario is considered. Landscape and visual assessments are separate, although linked, procedures. The landscape, its analysis, and the assessment of impacts on the landscape all contribute to the baseline for visual impact assessment studies. The assessment of the potential impact on the landscape is carried out as an impact on an environmental resource, i.e., the physical landscape. Visual impacts, on the other hand, are assessed as one of the interrelated effects on people (i.e., the viewers and the impact of an introduced object into a view or scene).

The study was undertaken using Geographical Information Systems (GIS) software as a tool to generate viewshed analyses and to apply relevant spatial criteria to the proposed infrastructure. A detailed Digital Terrain Model (DTM) for the study area was created from topographical data.

3.2. Factors

It is necessary to explore some generic aspects of visual impact associated with developments and structures before exploring the site-specific impacts.

The larger a structural feature, the more it is likely to be visible. Spatial footprint is also an important factor, as the larger the spatial footprint of a development, the more it will be likely to occupy a large portion of a landscape, thus having a greater potential to alter the visual character of the landscape.

3.2.1. Viewing distance

The distance of the viewer / receptor location away from an object is the most important factor in the context of the experiencing of visual impacts. Beyond a certain distance, even large structural features tend to be much less visible and are difficult to differentiate from the surrounding landscape. The visibility of an object is likely to decrease exponentially with increasing distance away from the object, with maximum impact being exerted on receptors at a distance of 500m or less. The impact decreases exponentially as one moves away from the source of impact, with the impact at 1000m being a quarter of the impact at 500m away At 5000m away or more, the impact would be negligible.

3.2.2. Presence of receptors

It is important to note that visual impacts are only experienced when there are receptors present to experience the impact; thus, in a context where there are no human receptors or viewers present there are not likely to be any visual impacts experienced.

3.2.3. Viewer perception

Value can be placed in a landscape in terms of its aesthetic quality, or in terms of its sense of identity or sense of place with which it is associated. If no such values are held with respect to a landscape, there is less likely to a perception of visual impact if the landscape is visually altered. On the opposite side of the scale, development within a landscape may not be perceived negatively at all if the development is associated with progress or upliftment of the human condition.

The perception of visual impacts is thus highly subjective and thus involves 'value judgements' on behalf of the receptor.

The context of the landscape character, the scenic / aesthetic value of an area, and the types of land use practiced tend to affect the perception of whether new developments are considered to be an unwelcome intrusion into that landscape. Sensitivity to visual impacts is typically most pronounced in areas set aside for the conservation of the natural environment (such as protected natural areas or conservancies), or in areas in which the natural character or scenic beauty of the area acts as a draw card for visitors (tourists) to visit an area, and accordingly where amenity and utilitarian ecological values are associated with the landscape. When landscapes have a highly natural or scenic character, amenity values are typically associated with such a landscape. Structural features such as high voltage power lines are not a feature of the natural environment but are rather representative of human (anthropogenic) change to a landscape. Thus when placed in a largely natural landscape, such structural features can be perceived to be highly incongruous in the context of the setting, especially if they affect or change the visual quality of a landscape. It is in this context of incongruity with a natural setting that new developments are often perceived to be a source of visual impact.

3.2.4. Landform (topographical) and micro-topographical context

The landform context of the environment in which the object is placed is an important factor. The location of the feature within the landform setting – i.e. in a valley bottom or on a ridge top is important in determining the relative visibility of the feature. In the latter case, the feature would be much more visible and would 'break' the horizon, if a viewer was located 'inferior' to the object in the topographical context. Similarly the landform context in which the viewer is located is important in that topography can inherently block views towards an object if the viewer is located in a setting such as a steep-sided valley or on an aspect facing away from the object. The morphological character of a slope is important in determining visibility of objects from other parts of the slope; typically where a slope is concave topography does not screen objects from view, but convex slopes reduce the visibility of the objects on the same slope. The micro-topography within the landscape setting in which the viewer and object are located is also important; the presence of micro-topographical features and objects such as buildings or vegetation that would screen views from a receptor position to an object can remove any visual impact factor associated with it.

3.2.5. Landscape development context

The presence / existence of other anthropogenic objects associated with the built environment may influence the perception of whether a new development is associated with a visual impact. Where buildings and other infrastructure exists, the visual environment could be considered to be already altered from a natural context and thus the introduction of a feature into this setting may be considered to be less of a visual impact than if there was no existing built infrastructure visible.

3.2.6. Receptor type and nature of the view

Visual impacts can be experienced by different types of receptors, such as people driving along roads, or people living / working in the area in which the structural feature is visible. The receptor type in turn affects the nature of the typical 'view' of a potential source of visual impact, with views being permanent in the case of a residence or other place of human habitation, or transient in the case of vehicles moving along a road. The nature of the view experienced affects the intensity of the visual impact experienced.

3.2.7. Weather and visibility

Meteorological factors, such as weather conditions (presence of haze, or heavy mist) which would affect visibility can impact the nature and intensity of a potential visual impact associated with a structural feature.

The VIA is determined according to the nature, extent, duration, intensity or magnitude, probability, and significance of the potential visual impacts, and will propose management actions and/or monitoring programs and may include recommendations related to the proposed mast.

The VIA considers potential cumulative visual impacts, or alternatively the potential to concentrate visual exposure/impact within the region.

The determination of the potential visual impacts is undertaken in terms of nature, extent, duration, magnitude, probability and significance of the construction and operation of the proposed infrastructure.

Anticipated issues related to the potential visual impact of the proposed development include the following:

- The visibility of the mast to, and potential visual impact on, observers travelling along the major local roads
- The visibility of the mast to, and visual impact on, the larger built-up centres or populated places as well as the homesteads (farm residences) located within close proximity of the site.
- Potential cumulative visual impacts (or alternately, consolidation of visual impacts) with specific reference to the existing power line infrastructure adjacent to the proposed development area.
- The potential visual impact of the construction of ancillary infrastructure on observers in close proximity of the development servitude.
- The visual absorption capacity of natural or planted vegetation (if applicable).
- Potential visual impacts associated with the construction phase.
- The potential to mitigate visual impacts and inform the design process.

It is envisaged that the issues listed above may constitute a visual impact at a local scale.

3.2.8. Significance of Visual Impact

A combined quantitative and qualitative methodology, as supplied by the Environmental Practitioner, was used to describe the significance of impacts. Significance of impact is rated as *consequence* of impact multiplied by the *probability* of the impact occurring. Consequence is determined using intensity, spatial scale, and duration criteria. A summary of each of the qualitative descriptions along with the equivalent quantitative rating scale is given in Annexure C.

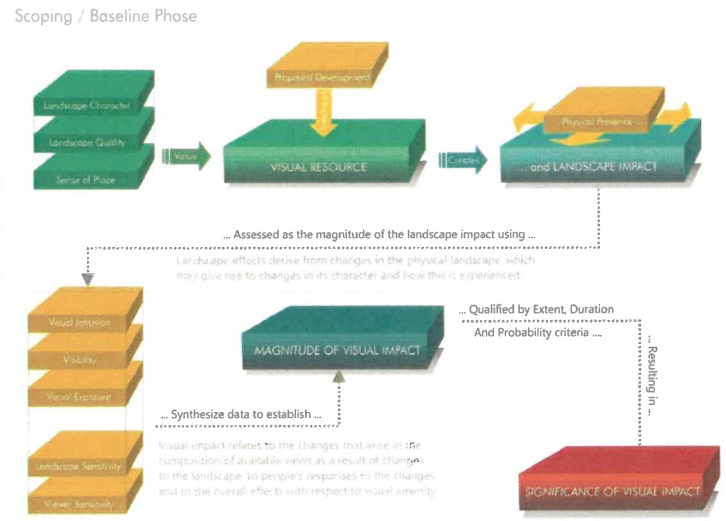

Figure 5: VIA Process

3.3. Methodology

The following method was used:

- Site visit: A field survey was undertaken so the extent of the receiving environment could be documented and adequately described. The climate conditions were mostly sunny with some cloud cover.
- Project components: The physical characteristics of the Project components were described and illustrated based on information supplied by EnviroAfrica Consultants.
- General landscape characterization: The visual resource (i.e., receiving environment) was mapped using the field survey, Google Earth imagery, and Mucina and Rutherford's (2006) reference book, The Vegetation of South Africa, Lesotho, and Swaziland. The description of the landscape focused on the nature of the land rather than the response of a viewer.
- The character of the landscape was described and rated in terms of its aesthetic appeal using recognized contemporary research in perceptual psychology as the basis, and its sensitivity as a landscape receptor.
- The sense of place of the study area was described as to its uniqueness and distinctiveness. The primary informant of these qualities was the spatial form and character of the natural landscape together with the cultural transformations associated with the historic/current use of the land.
- The creation of viewshed analyses from the proposed Project site in order to determine the visual exposure and the topography's potential to absorb the potential visual impact. The viewshed analyses consider the dimensions of the proposed structures and activities.
- The potential impact on the visual environment of the proposed Projects were identified; and rated according to EnviroAfrica's significance rating criteria.
- Measures to mitigate the negative impacts of the proposed Project were recommended.

4. DESCRIPTION OF THE PROJECT

4.1. Project Facilities

The current roll out of telecommunication infrastructure by cellular network providers is undertaken to upgrade and improve network coverage and quality to all customers. Telecommunication networks experience peak demand in the evenings between 19:00 and 23:00.

This is due to the fact that during these times people are at their homes and use internet intensive devices. As a result, a large portion of the network upgrade is aimed at residential areas. Business and other activity areas have been prioritised over the past 20 years, for commercial reasons and given the fact that legislation and policies steered proposals of this nature, towards non-residential areas.

Modern advances in telecommunication technology (LTE/4G) provide reliable internet connections to an increased number of users which alleviates the pressure on the various base stations, however their operational range are limited in comparison to older technologies. Locations for telecommunication infrastructure are primarily chosen within areas where a need exists for coverage. If a need for coverage does not exist in a specific area, no company would invest capital to build a telecommunication base station in said area. The fact that there are only a few telecommunications base stations in the surrounding area supports the statement that there is a clear need for coverage in the area. The need for coverage is however not the only determining factor when identifying a possible position for a telecommunication base station. Other determining factors include altitude, zoning and the visual impact of the proposed base station. In most cases a list of possible positions for the base station is provided to the client, who chooses the optimal location.

A height of 45m was required to provide sufficient coverage and to accommodate more service providers (thereby requiring less masts in the area). A Lattice Mast would be able to provide sufficient height and be able to accommodate the service providers and is also cheaper to construct than a tree mast, it's visual impact would be higher and would stand out more.

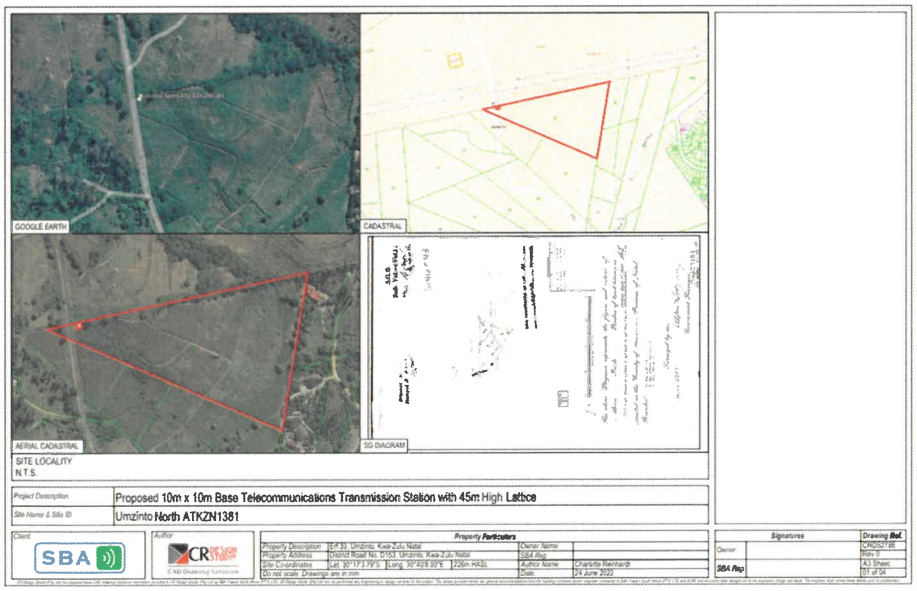

Figure 6: Site Locality

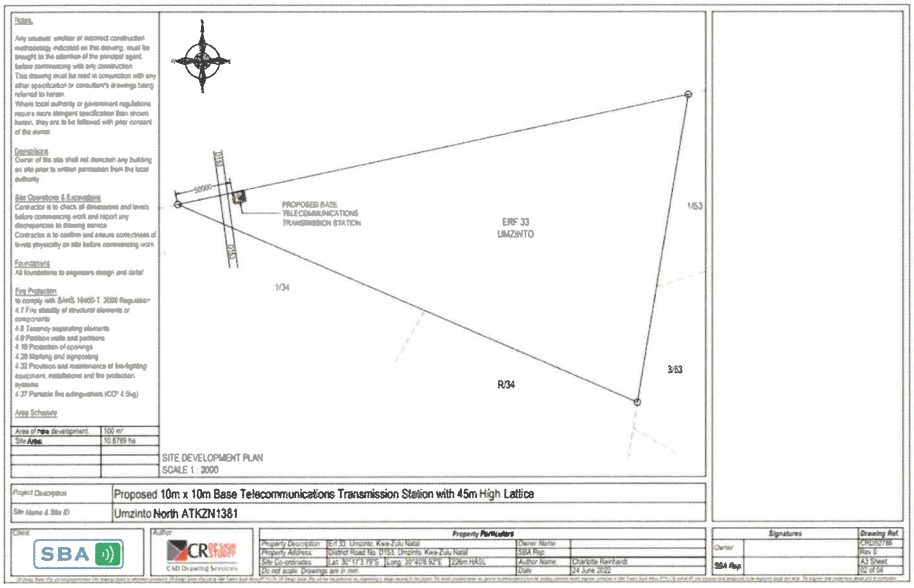

Figure 7: Site Development Plan

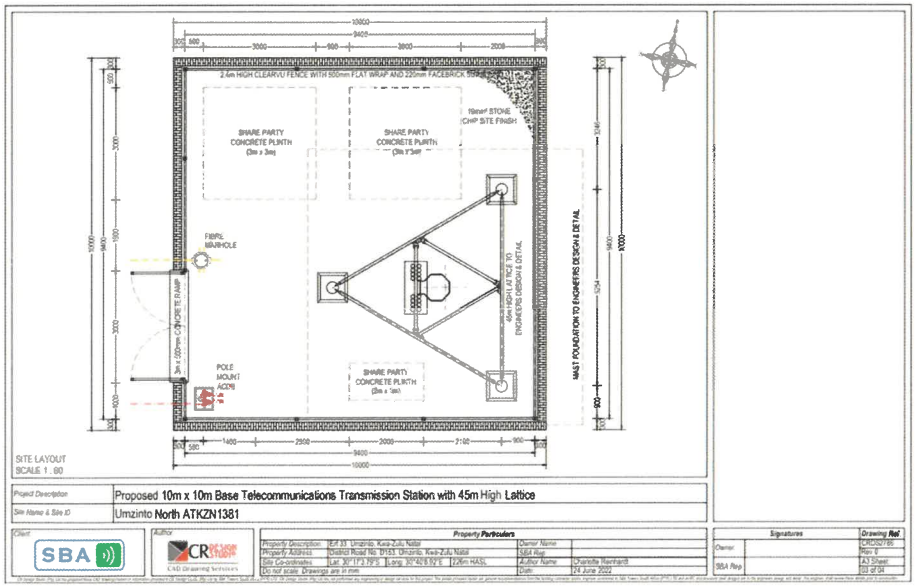

Figure 8: Telecommunications mast layout

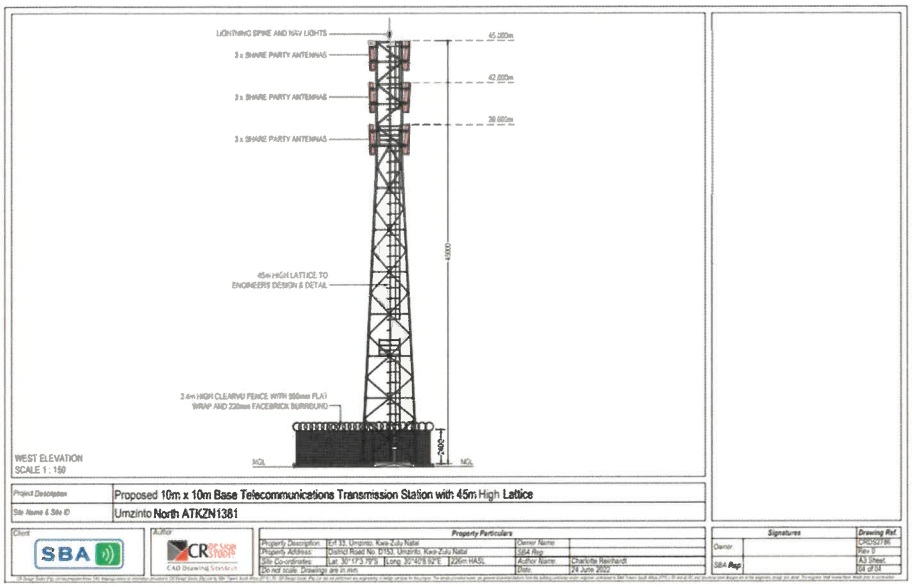

Figure 9: Telecommunications mast west elevation profile

Figure 10: Examples of lattice tower with palisade fencing

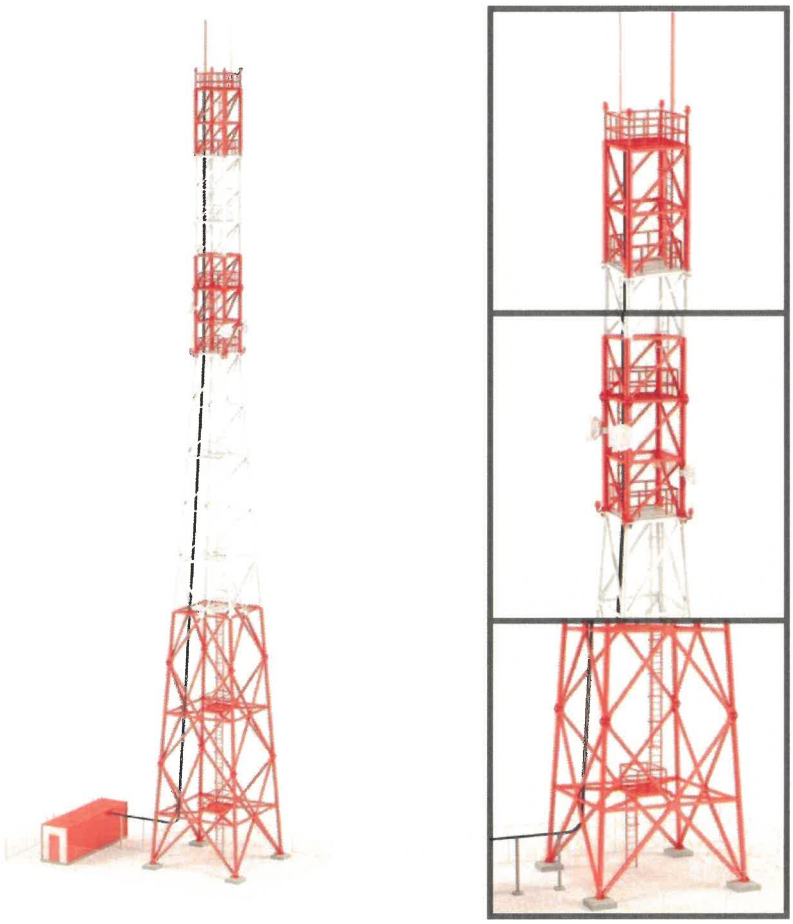

Figure 11. Example of a 3D view of a telecomunication mast

4.1.1. Access Roads

There is an extensive network of provincial surfaced roads that form the access backbone to the study area. Secondary district gravel roads provide access to farms on which the mast will be located. Access roads to the proposed mast may therefore only need to be constructed for short distances on private and tribal land in the south of the study area where there are no existing roads.

4.2. Project Phases and Activities

Activities to be undertaken during each of the phases are described below:

- The establishment of a construction camps will be required for the construction of the mast. The exact position of the construction camps will be negotiated with the relevant landowners. Strict conditions, including the approval of the location of the construction camp by the Environmental Control Officer (ECO), as well as for the use and management of resources are set out in the Construction Environmental Management Plan Construction (EMP) and will have to be adhered to.

- An 100m wide strip directly under the position of the mast will be cleared of all vegetation for construction

purposes. Any plants that could interfere with the construction, maintenance or operation of the mas, will be removed or trimmed. Standards to be adhered to for vegetation clearing and protected species management have been specified in the EMP.

- Existing roads will be used as far as possible. Any additional authorisations (from DWAF, MDALA or DAEA) is a condition of the EMP and must be obtained during the implementation phase of the project. Gates will be installed on access fences. Any existing infrastructure will be maintained in its existing condition. Access points and roads will be negotiated with the relevant landowners.
- Foundations may be drilled, mechanically excavated, or dug by hand. No blasting will take place. Concrete is then placed.
- Any incomplete excavations will be protected to prevent animals and people from injury. All foundations are backfilled and stabilised through compaction and capped with concrete at ground level. Towers are lifted into position by cranes or helicopters. Ongoing maintenance of the mast will be required throughout its lifespan.

5. ENVIROMENTAL SETTING

5.1. Landscape Character

The climate of area is described as being sub-tropical. The mean annual maximum temperature is 28.6°C, with the maximum mean average occurring in January at 32.4°C. The mean annual minimum is 15.9°C with the mean minimum of 8.6°C occurring in June/July. The climate is characterised by high humidity.

The 30 year mean annual rainfall at is 584 mm. The rainfall pattern can typically be of heavy downpours followed by long dry spells. The only long-term evaporation data available is that for Makhathini Agricultural Research Station where the average annual recorded evaporation is 1,983 mm.

The study area is characterised by a series of tall north-south aligned ridges and associated enclosed valleys. From a macro-geomorphological perspective, the incised terrain of valleys surrounded by hills reflects landscape-level erosional processes that have resulted in faster erosion of the softer shales, with the harder quartzites forming the ridges. Three such longitudinal valleys are present within the wider study area.

The study area is rural in nature, and rural land uses largely predominate. The nature of the mountainous topography (and as a result, very shallow, rocky soils) prohibits the practising of cultivation over much of the study area, and as such livestock raising or game farming occurs as the predominant rural land use. This has allowed the natural vegetation to be retained over large parts of the study area. Cultivation only occurs in spatially limited areas but is intensive where it occurs.

An important component of the land use in the study area is conservation. In such areas conservation land use has allowed the natural vegetation to be retained and there is limited (low density) or no development apart from the creation of ecotourism facilities. Vegetation cover is intrinsically related to land use as described above; vegetation in that is highly effective in screening even large objects from view.

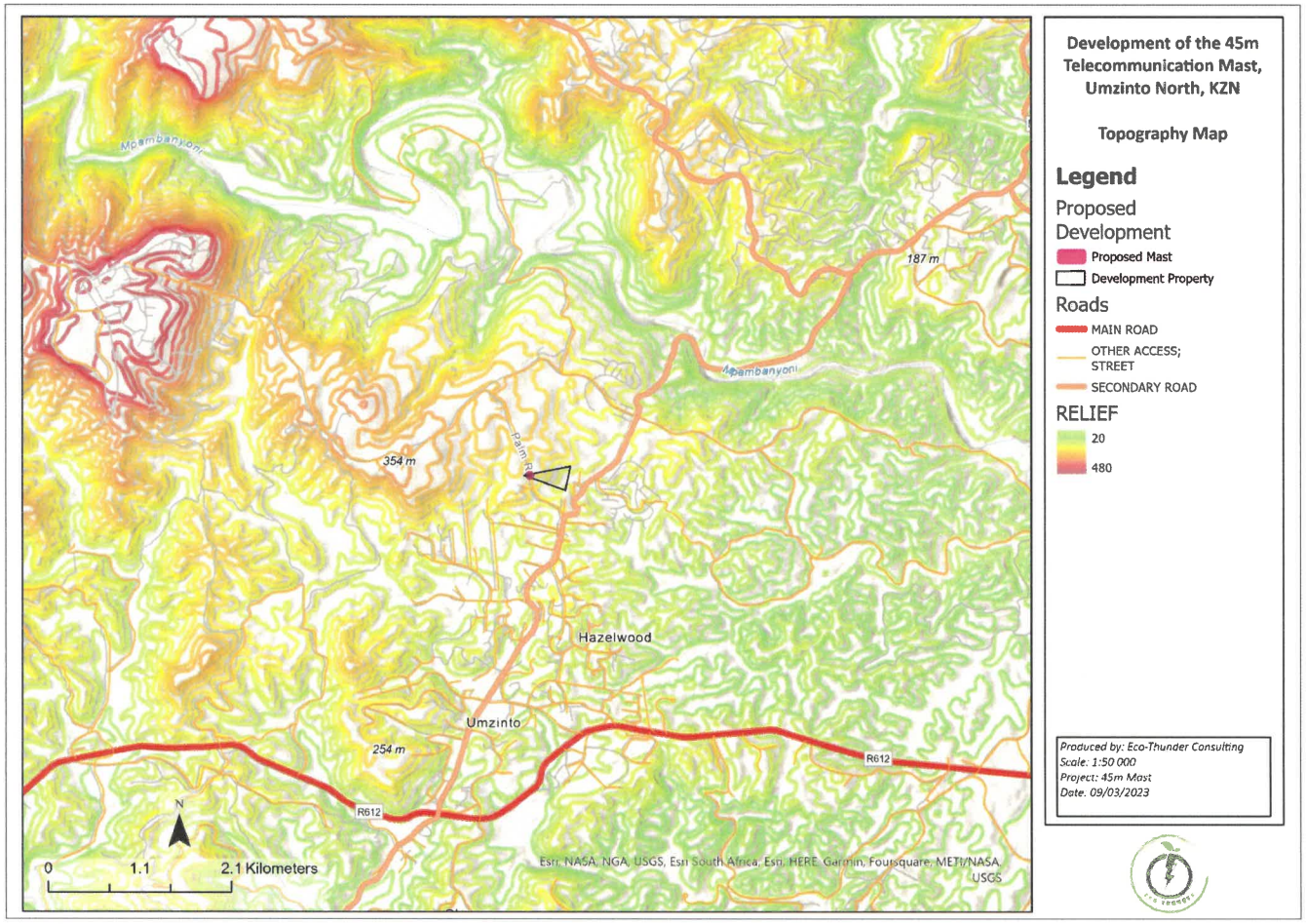

Figure 12 Topographical Map

Agriculture is one of the most important economic activities in the study area and accounts for a significant proportion of land use.

Due to the nature of the geology in the study area there is no potential seismic sensitivities. The study area is considered very flat and ranges from 227 mamsl (metres above mean sea level) to 226 mamsl. Figure 12 is an illustration of the topography of the site.

5.2. Land Use

Permanent buildings: These dwelling consist of a mix of modern and traditional structures made out of a mix of materials.

Land: The majority of the areas where households are engaged in crop and small-scale livestock farming Majority of the area is utilized for agriculture.

The following farm settlements or residences are located within the study area:

- Umzinto
- Hazelwood
- Emahlathini
- Scottburgh

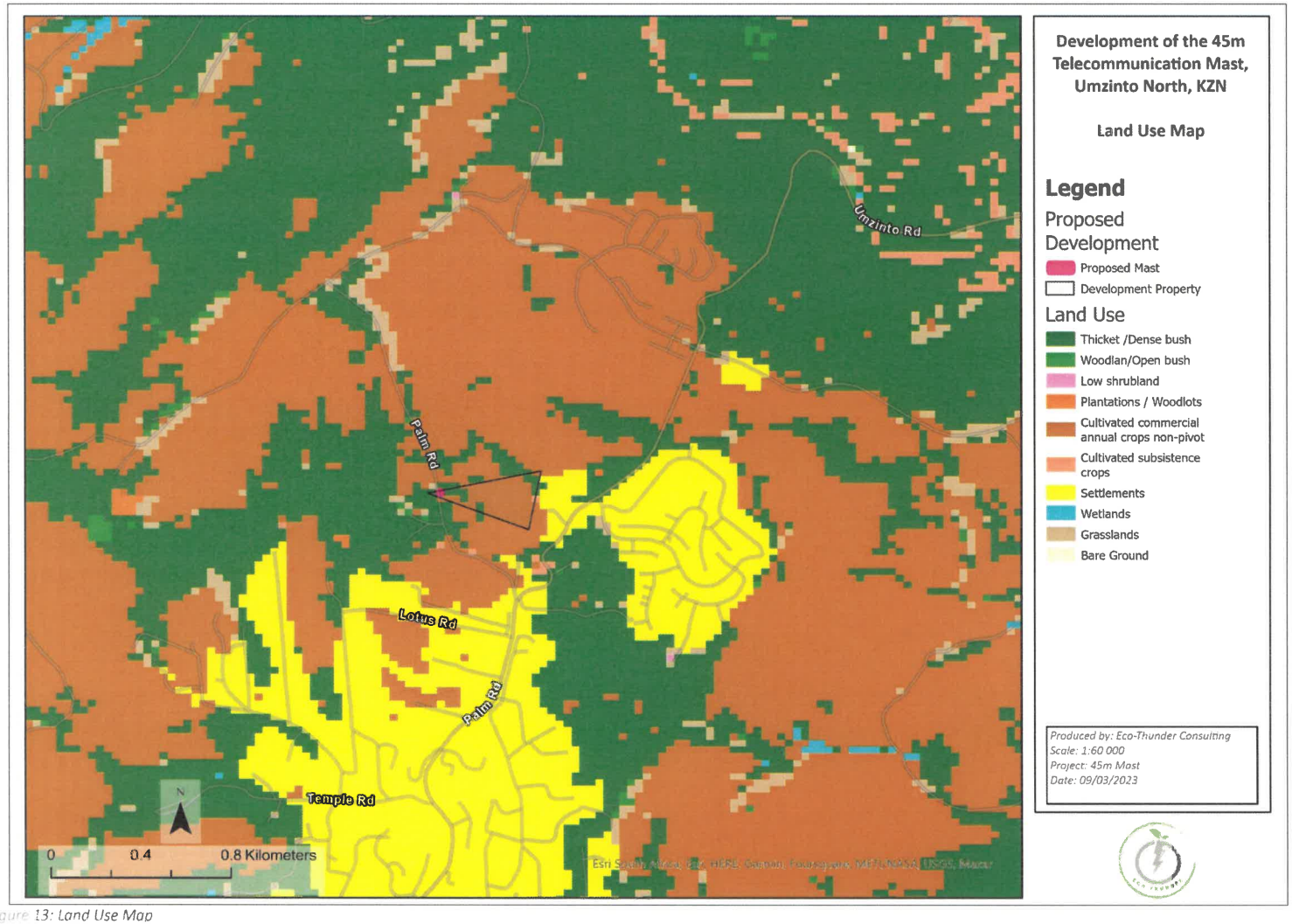

Figure 13: Land Use Map

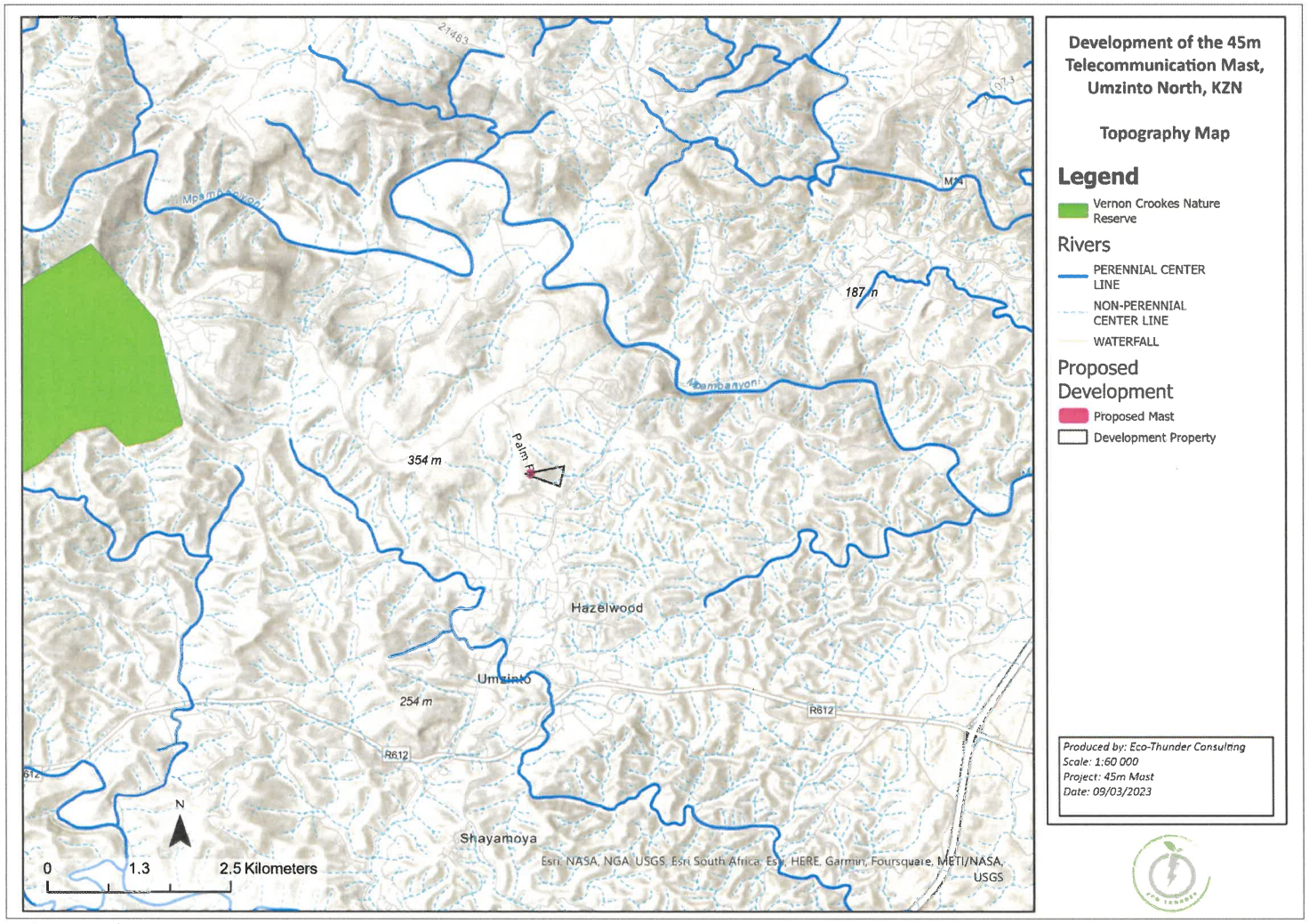

Figure 14. Protected areas map

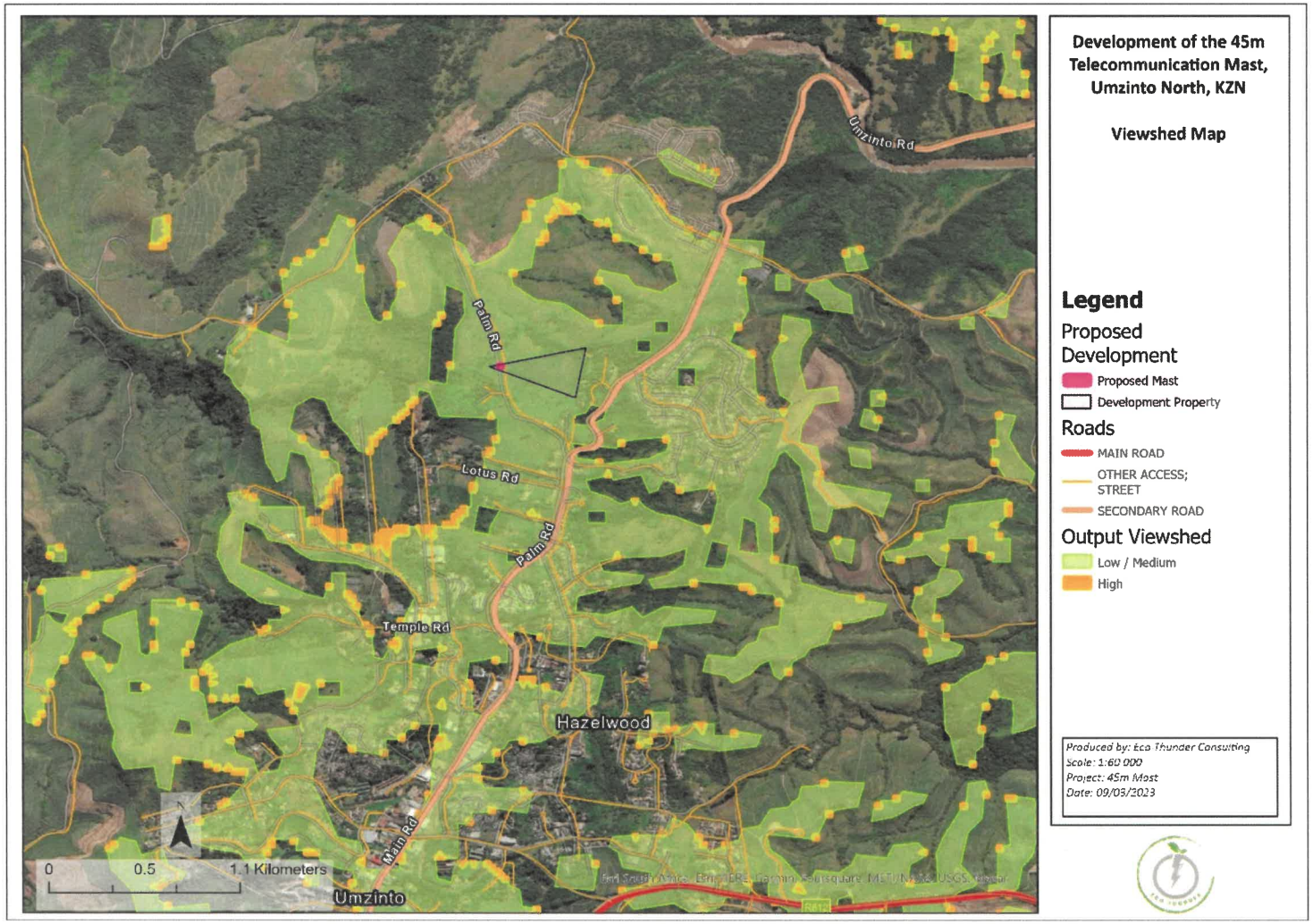

Figure 15: Viewshed analysis of the proposed development

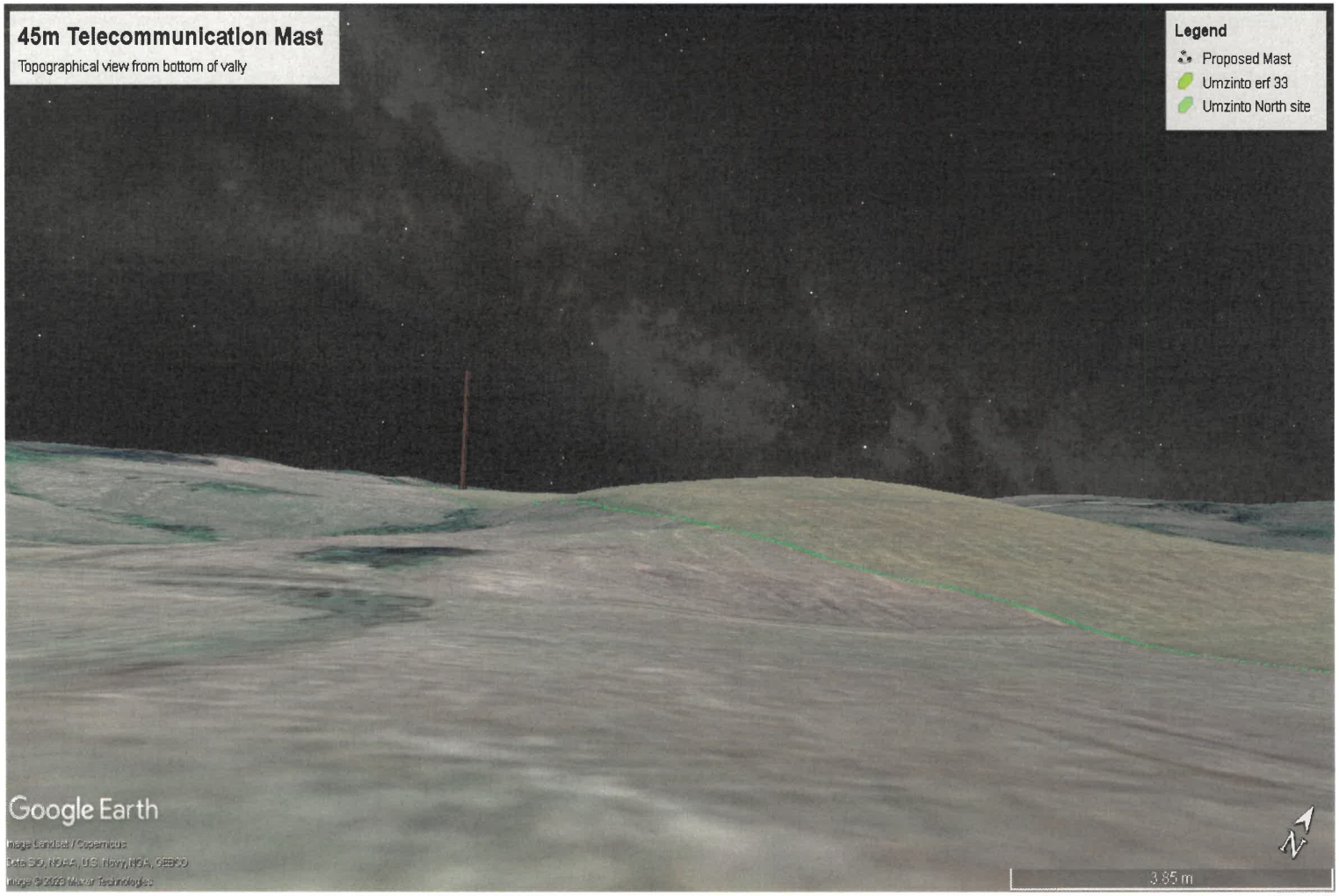

Figure 16: Topographical view of development from the south

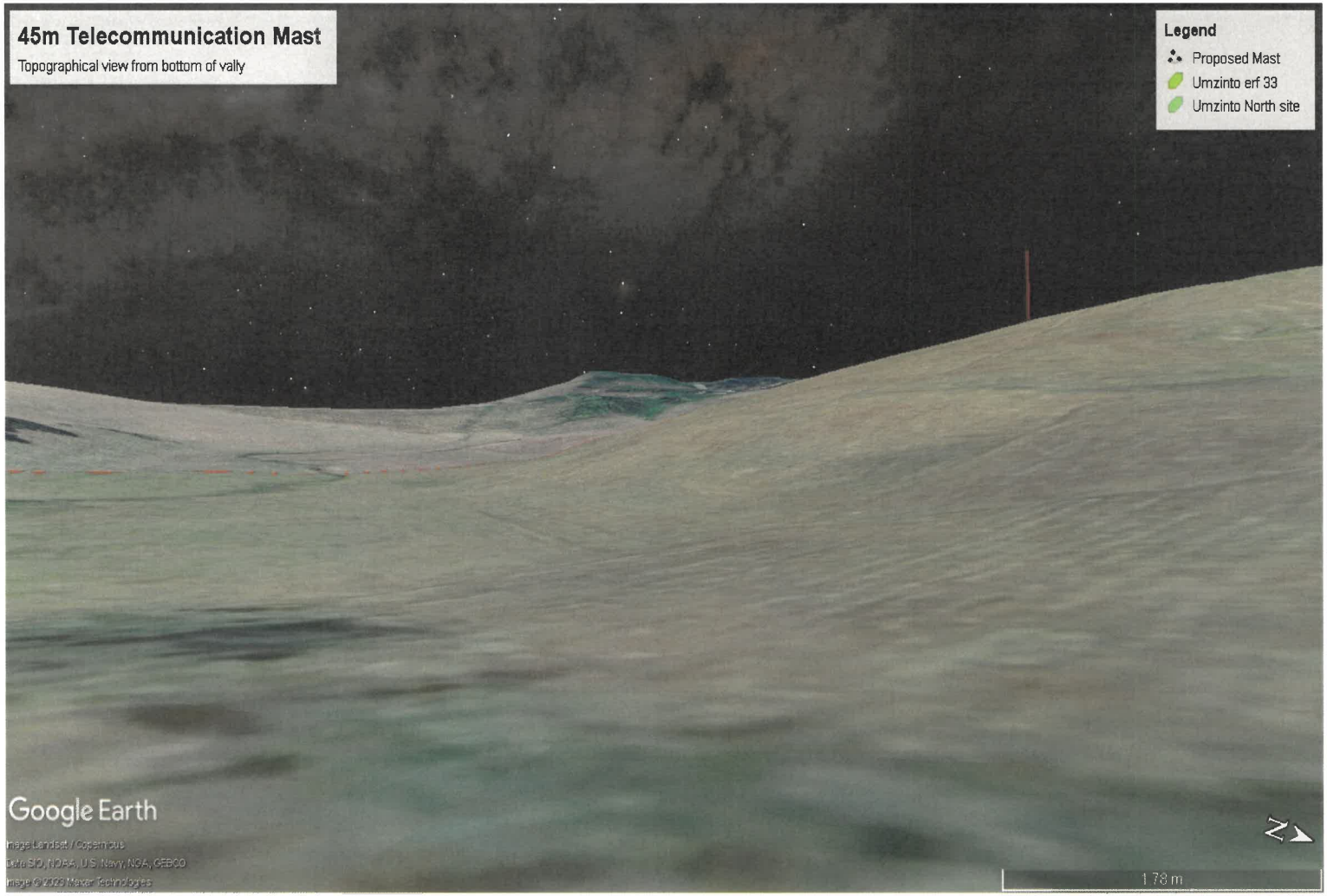

Figure 17. Topographical view of development from the south b

Figure 18: Topographical view of development from the east

Figure 19: Streetview from closest home

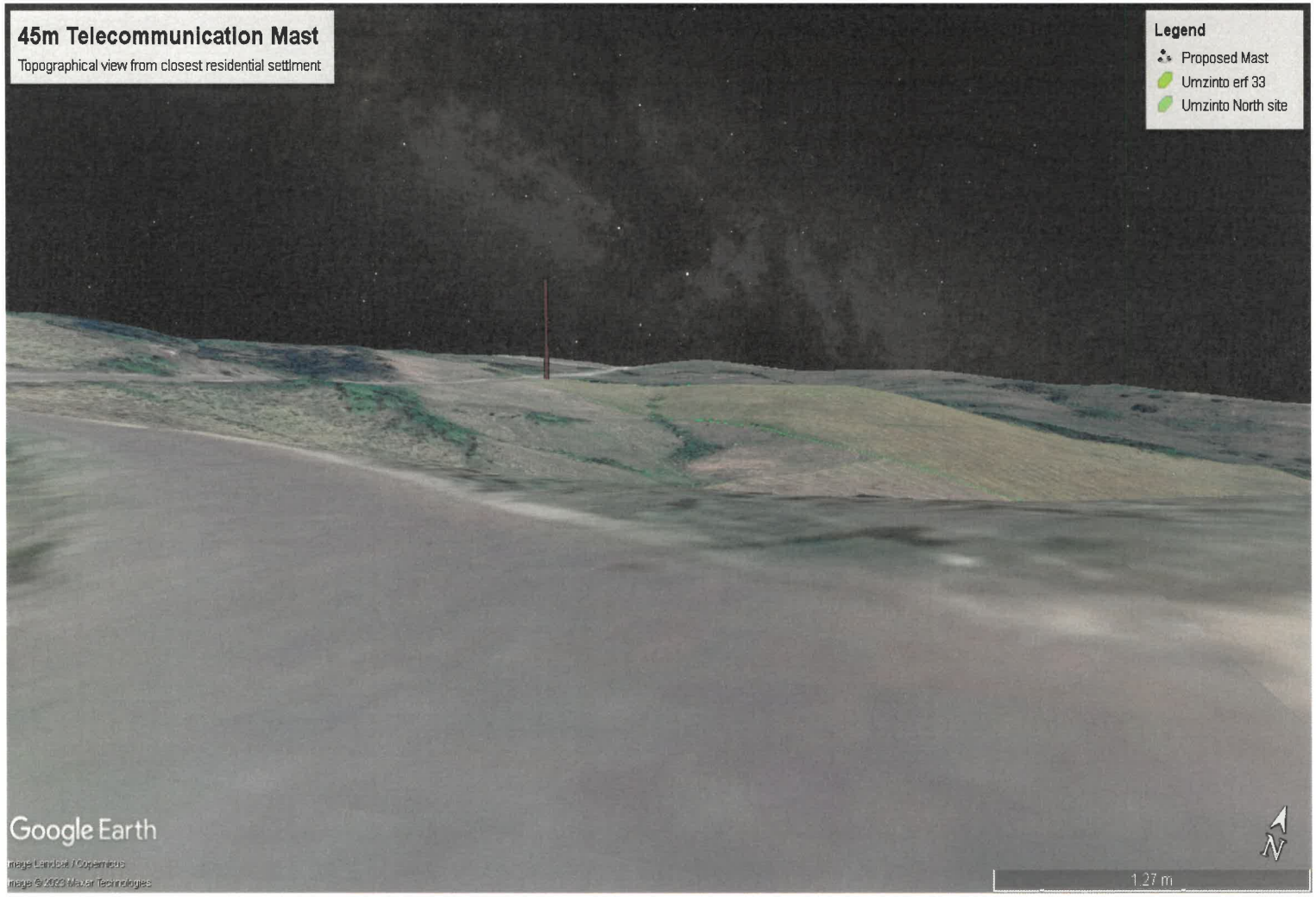

Figure 20: Topographical view from home

Figure 21 Streetview from P189-3, blue indicating proposed site

Figure 22: Streetview from unnamed road next to site

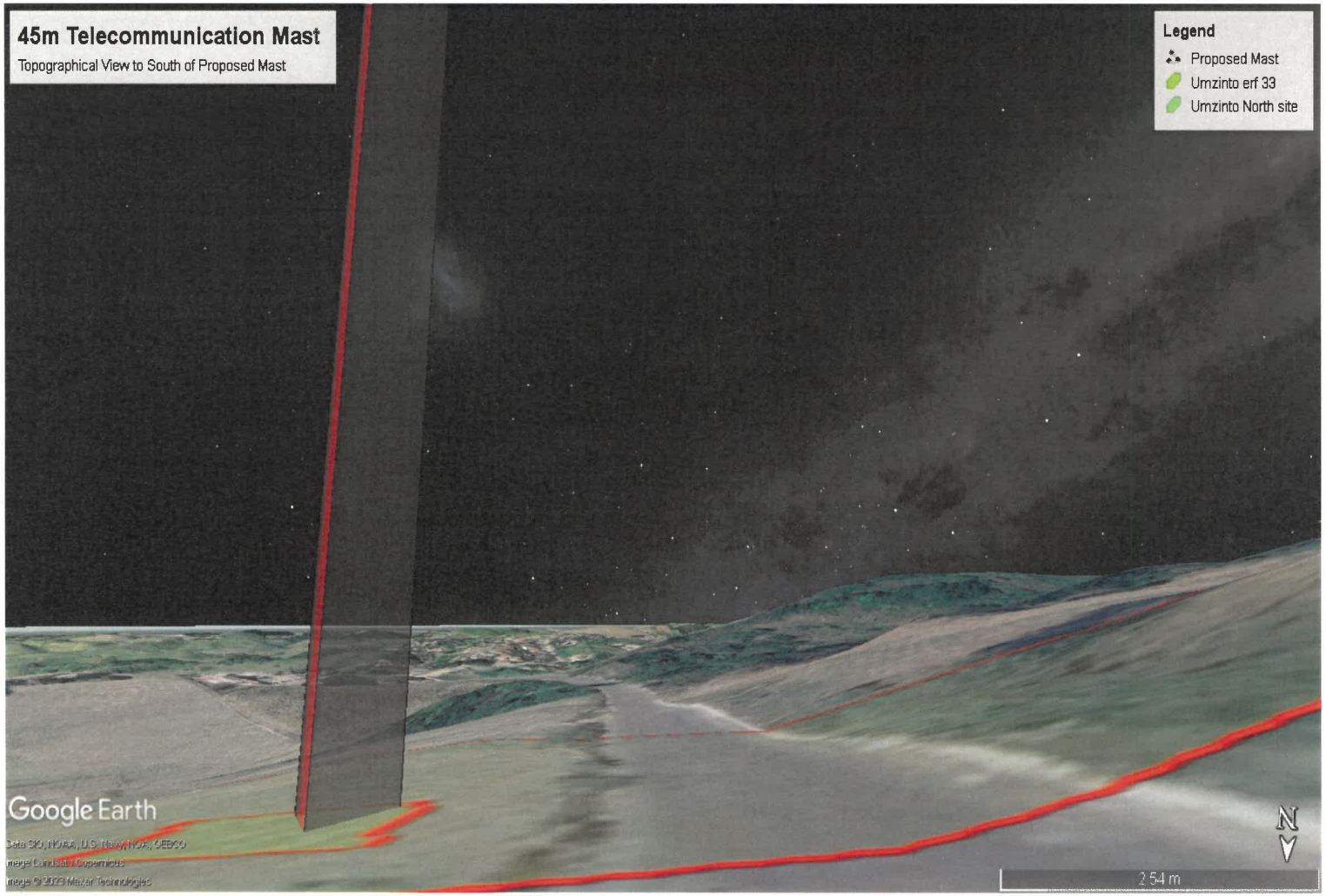

Figure 23: Topographical view from site

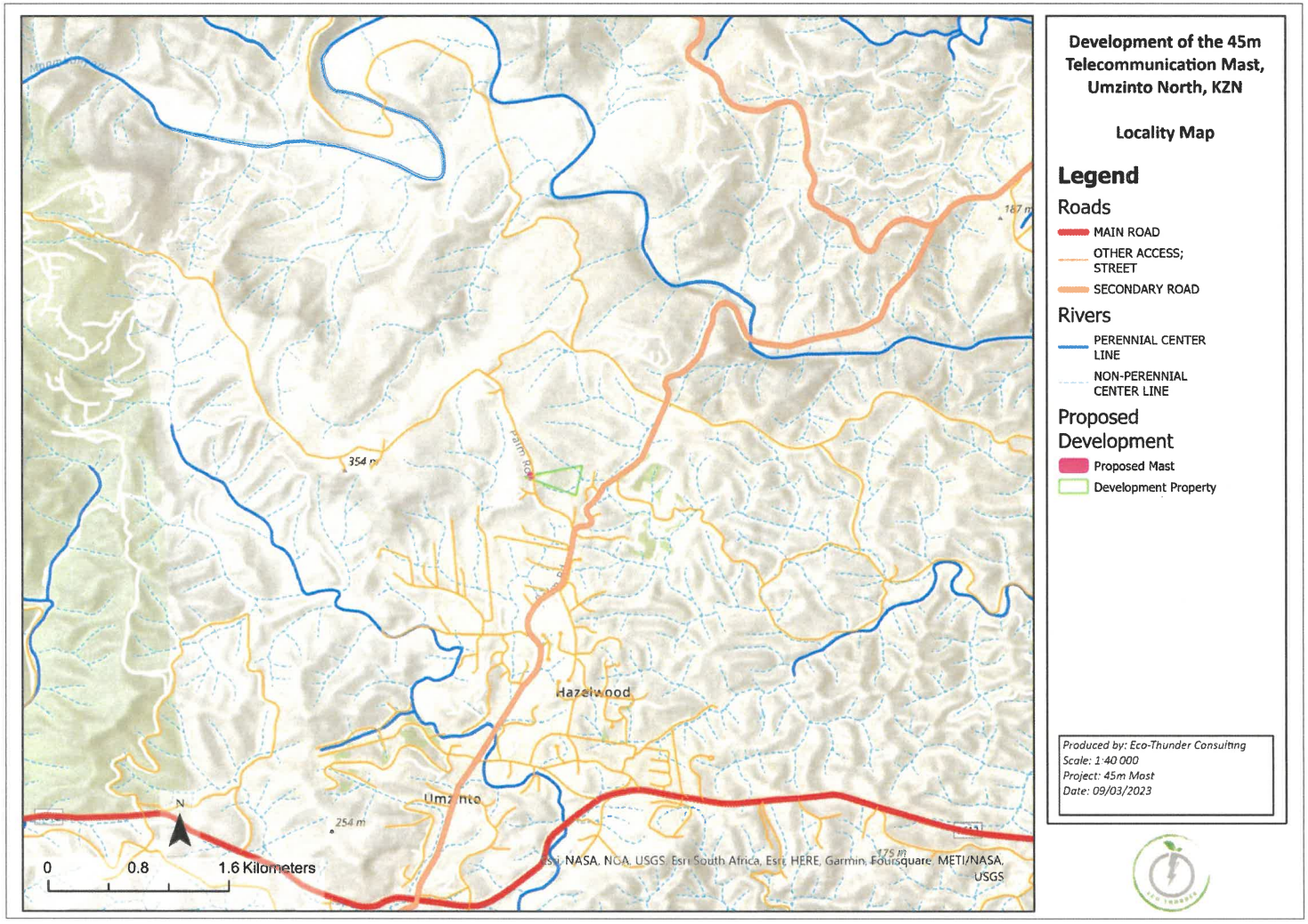

Figure 24: Locality Map


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Longitude : 30.667974046466437°
Altitude : 269.0 meter
Date : 03/01/2023 09:47 AM
Accuracy : 5.0 meter
Time zone : SAST
Note : Captured by Note cam


Note cam lite
Address : KwaZulu-Natal,South Africa
Latitude : -30.282646613542198°
Longitude : 30.668728735232005°
Altitude : 269.0 meter
Date : 03/01/2023 09:49 AM
Accuracy : 5.0 meter
Time zone : SAST
Note : Captured by Note cam


Note cam lite
Address : KwaZulu-Natal,South Africa
Latitude : -30.282646613542198°
Longitude : 30.668728735232005°
Altitude : 269.0 meter
Date : 03/01/2023 09:49 AM
Accuracy : 5.0 meter
Time zone : SAST
Note : Captured by Note cam


Note cam lite
Address : Umzinto,KwaZulu-Natal,South Africa
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Longitude : 30.669184237428077°
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Time zone : SAST
Note : Captured by Note cam


Note cam lite
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Time zone : SAST
Note : Captured by Note cam


Note cam lite
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Longitude : 30.66898089887773°
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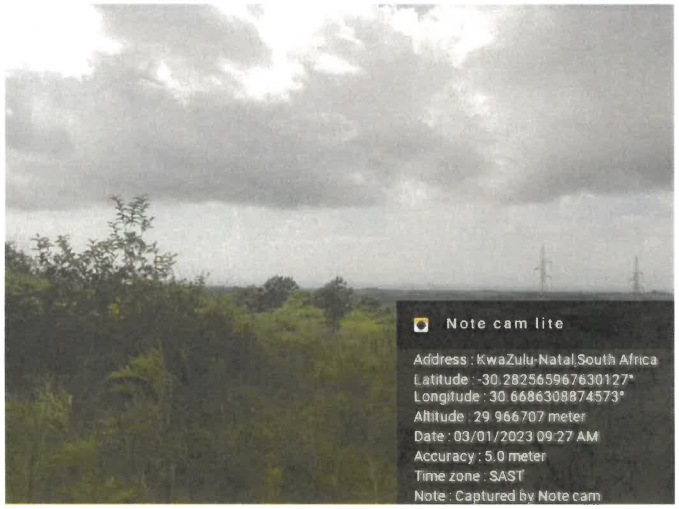
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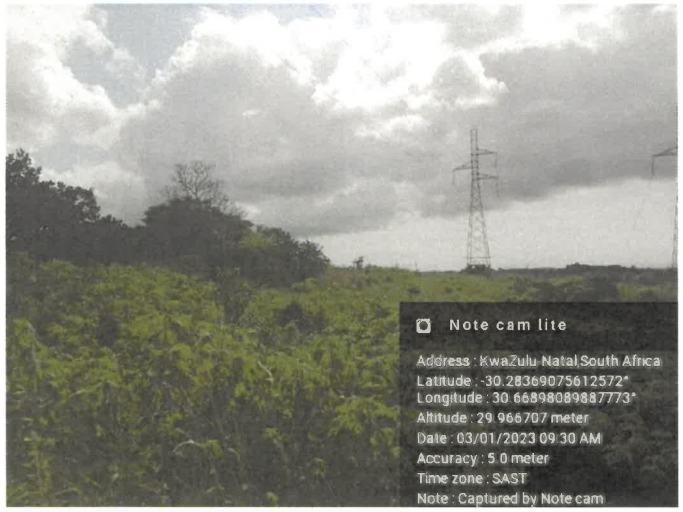
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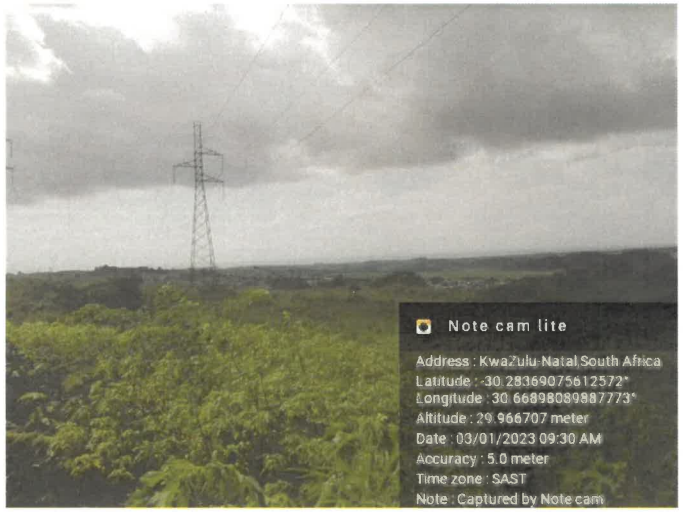
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Longitude : 30.668980898877 73°
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Accuracy : 5.0 meter
Time zone : SAST
Note : Captured by Note cam


Note cam lite
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Longitude : 30.670823754537544°
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Accuracy : 5.0 meter
Time zone : SAST
Note : Captured by Note cam


Note cam lite
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Figure 25 - 38 Site Photos

6. VISUAL RESOURCE

6.1. Visual Resource Value, Scenic Quality and Landscape Sensitivity

The size of the transmission line tower (45m high) will alter the visual character and quality of the landscape over which it traverses. The visual impact study is intended to assess the extent of the visual intrusion on the existing landscape and to identify alternatives that will have the least visual impact. In addition, visual impact mitigation guidelines will be presented.

The assessment of tourism and eco-tourism issues take place within the context of "sense of place." The concept of sense of place is applicable to tourist areas. People go on holiday for various and different reasons, e.g., to escape, to be entertained, to enjoy nature, to socialise, etc. In choosing a destination the image of the place is being considered, e.g. its authenticity, its offering, and/or its status.

The way in which these landscapes are managed are important to maintain the image (e.g. signs of erosion), and badly managed interference (e.g. not rehabilitating the land once a mast has been erected) could negatively affect the image of a tourist destination. In essence, expectations of an area have to be met. For example, people will not be accepting of a pylon in the middle of an area marketed as "pristine."

Experience has shown that it is possible to cultivate land around masts, but it does complicate the process, and land for cultivation is lost. This is because the use of implements, equipment and infrastructure can be problematic.

Masts on grazing land pose fewer problems, as cattle move around these. During the construction and operational phase it has happened that construction/maintenance teams leave gates open, don't follow access roads, and cut through fences. The effect could be less land available for cultivation and grazing, cross breeding of cattle, erosion, and loss of cattle and sheep.

The visual impact of the project and associated structures will reduce exponentially as the viewer moves further away from the proposed structures (Hull and Bishop, 1988).

Critical views were determined during the field trip, land cover maps and from the 1:50 000 topographical maps. The major critical viewing area is the area identified as having a medium to high visual sensitivity.

6.2. Visual Character

Visual character is based on human perception and the observer's response to the relationships between and composition of the landscape, the land uses and identifiable elements in the landscape. The description of the visual character includes an assessment of the scenic attractiveness regarding those landscape attributes that have aesthetic value and contribute significantly to the visual quality of the views, vistas and / or viewpoints of the study area (ALA, 2013).

6.3. The Viewshed

The viewshed represents the area from which the proposed site would potentially be visible. The extent of the viewshed is influenced primarily by the combination of topography and vegetation, which determine the extent to which the site would be visible from surrounding areas. The viewshed was determined by Eco Thunder through the following steps and presumptions: The likely viewshed was determined by desktop study (ArcGIS) using contour plans (20m interval); and an offset of 2m (maximum) for the observer and an offset of 45m (maximum) for the proposed mast was utilized during the spatial analysis.

Site visibility is an assessment of the extent to which the proposed mast would potentially be visible from surrounding areas. It takes account of the context of the view, the relative number of viewers, duration of view and view distance. Based on a combination of all these factors an overall rating of visibility was applied to each observation point. For the purpose of this report, categories of visibility have been defined as high (H), moderate (M) or low (L).

The cone of vision is relatively wide and the viewer tends to scan back and forth across the landscape. In contrast views from a moving vehicle are dynamic as the visual relationship between the proposed mast is constantly changing as well as the visual relationship between the proposed mast in which they see it. The view cone for motorists, particularly drivers, is generally narrower than for static views.

The elevation of the viewer relative to the object observed significantly influences the visibility of the object by changing the background and therefore the visual contrast. In situations where the viewer is at a higher elevation than the building/structure it will be seen against a background of landscape. The level of visual contrast between the proposed mast and the background will determine the level of visibility. A white/bright coloured structure seen against a background of dark/pale coloured tree-covered slopes will be highly visible compared to a background of light-coloured slopes covered by yellow/brown dry vegetation.

The visibility of structures will increase with the period over which they are seen. The longer the period of view the higher the level of visibility. However, it is presumed that over an extended period the level of visibility declines as people become accustomed to the new element in the landscape.

Long term views of the proposed mast will generally be associated with farm houses, informal settlements and a couple of towns located within the viewshed. Short term and moderate term views will generally relate to commuters moving through the viewshed mostly by vehicle.

Potential views to the proposed mast are likely to be blocked in some localized situations by buildings, vegetation or local landform features at specific locations within the viewshed. Similarly, glimpses of the proposed mast may be available from some isolated high-elevation locations outside the plotted viewshed.

When the criteria are considered and understood within the context of the sub-region, a visual resource value of low (power utility and mining areas), moderate (drainage lines, open farmland, and urban recreation development), and high (bush-covered low hills), is allocated.

Table 1: Value of the Visual Resource
(After: LiEMA 2013)

High	Moderate	Low
This landscape type is considered to have a *high* value because it is a: Distinct landscape that exhibits an extremely positive character with valued features that combine to give the experience of unity, richness, and harmony. It is a landscape that may be of particular importance to conserve, and which has a strong sense of place.	This landscape type is considered to have a *moderate* value because it is a: Common landscape that exhibits some positive character, but which has evidence of alteration / degradation / erosion of features resulting in areas of more mixed character.	This landscape type is considered to have a *low* value because it is a: Minimal landscape generally negative in character with few, if any, valued features.
Sensitivity: It is sensitive to change in general and will be detrimentally affected if change is inappropriately dealt. with.	Sensitivity: It is potentially sensitive to change in general and change may be detrimental if inappropriately dealt with.	Sensitivity: It is not sensitive to change in general and change may be detrimental if inappropriately dealt with.

6.4. Sense of Place

According to Lynch (1992), a sense of place is the extent to which a person can recognize or recall a place as being distinct from other places - as having a vivid, unique, or at least particular character of its own. The sense of place for

the study area derives from a combination of the local landscape types described above, their relative 'intactness', and their impact on the senses.

Sense of place goes hand in hand with place attachment, which is the sense of connectedness a person/community feels towards certain places. Place attachment may be evident at different geographic levels, e.g. site specific (e.g. a house, burial site, or tree where religious gatherings take place), area specific (e.g. Zululand), and physiography specific (e.g. wetlands). Territorial behaviour is viewed as a set of behaviours and cognition a group exhibits based on perceived ownership. The concept of sense of place attempts to integrate the character of a setting with the personal emotions and memories associated with it.

Much of what is valuable in a culture is embedded in place, which cannot be measured in monetary terms. It is because of a sense of place and belonging that people are loath to be moved from their dwelling place, despite the fact that they will be compensated for the inconvenience and impact on their lives. Places/natural resources should be assessed in terms of its cultural value by studying visiting and consumption patterns, behaviour patterns, etc.

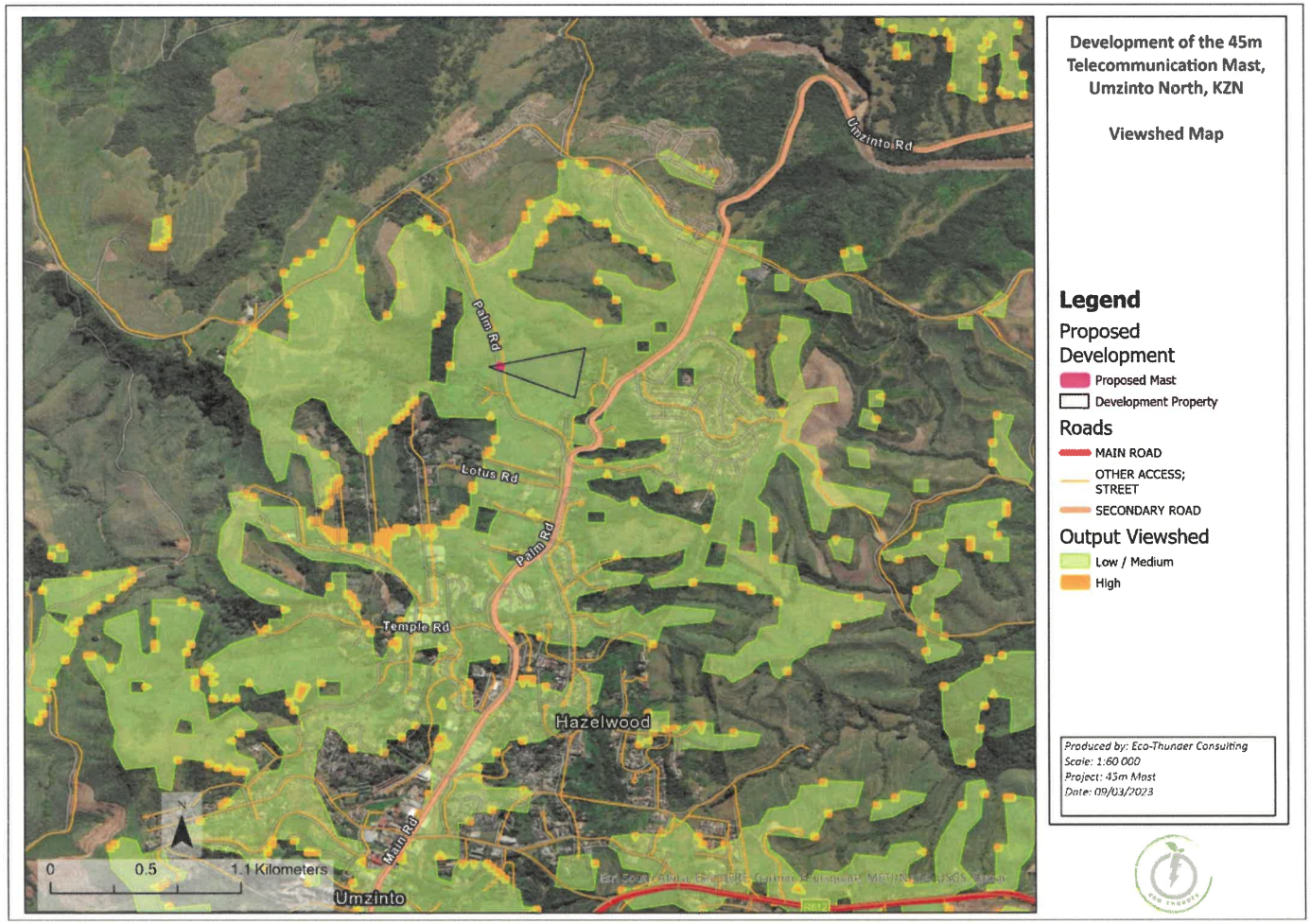

Figure 39: Viewshed analysis

7. VISUAL IMPACT ASSESSMENT

A GIS was used to calculate viewshed(s) for the proposed telecommunication mast. Other associated infrastructure may be built. However, the visual impact of these features is not considered as important as those of the mast. For this reason, such other structures were not considered in the VIA. The viewsheds and information gathered during the field survey were used to define criteria such as visibility, viewer sensitivity, visual exposure and visual intrusion for the proposed development. These criteria are, in turn, used to determine the intensity of potential visual impacts on sensitive viewers. All information and knowledge acquired as part of the assessment process were then used to determine the potential significance of the impacts according to the standardized rating methodology as described in Section 7.2 of this document.

The approach to the first phase was to gain an overall impression of the terrain through which the proposed mast will pass. This was achieved by desktop assessments and by driving through the general areas identified for the routes.

The traversing of the route provided a broad overview of topographic and specific constraints (e.g., pans, irrigated areas) from a visual impact viewpoint, in addition human scale interpretation of the route. Maps of land cover were used to correlate visual and mapped features.

Landscape impacts are alterations to the fabric, character, visual quality and visual value which will either positively or negatively affect the landscape character. During the construction and operational phases, the project components are expected to impact on the landscape character of the landscape types it traverses. Within the receiving environment, specific viewers (visual receptors) experience different views of the visual resource and value it differently. They will be affected because of alterations to their views due to the proposed project. The visual receptors are grouped according to their similarities. The visual receptors included in this study are:

- Residents.
- Tourists; and
- Motorists.

The intensity of impact is assessed through a synthesis of visual intrusion, visibility, visual exposure, and viewer sensitivity criteria. Once the intensity of impact has been established this value is further qualified with spatial, duration and probability criteria to determine the significance of the visual impact.

7.1. Visual Absorption Capacity

The criteria used to determine the intensity of the visual impact of the proposed mast on the area includes the area from which the mast can be seen (the viewshed), the viewing distance, the capacity of the landscape to visually absorb structures and forms placed upon it (the visual absorption capacity), and the appearance of the project from important or critical viewpoints.

The spirit, or sense, of place is that quality imparted by the aspects of scale, colour, texture, landform, enclosure, and in particular, the land-use. According to K. Lynch (1992) "it is the extent to which a person can recognise or recall a place as being distinct from other places as having a vivid, or unique, or at least a particular, character of its own."

The quality of Genius Loci is a function of attributes such as the scenic beauty or uniqueness and distinctive character of the built and cultural landscape.

7.2. VIA Rating Methodology

This section will attempt to quantify the potential visual impacts in their respective geographical locations and in terms of the identified issues related to the visual impact.

The methodology for the assessment of potential visual impacts states the **nature** of the potential visual impact (e.g.,

the visual impact on users of major roads in the vicinity of the proposed mast and includes a table quantifying the potential visual impact according to the following criteria:

- **Extent** - long distance (very low = 1), medium to longer distance (low = 2), short distance (medium = 3) and very short distance (high = 4)[2].
- **Duration** - very short (0 – 1yrs. = 1), short (2 – 5yrs. = 2), medium (5 – 15yrs. = 3), long (>15 yrs. = 4), and permanent (= 5).
- **Magnitude** - None (= 0), minor (= 2), low (= 4), medium / moderate (= 6), high (= 8) and very high (= 10)[3].
- **Probability** – very improbable (= 1), improbable (= 2), probable (= 3), highly probable (= 4) and definite (= 5).
- **Status** (positive, negative, or neutral).
- **Reversibility** - reversible (= 1), recoverable (= 3) and irreversible (= 5).
- **Significance** - low, medium, or high.

The *significance* of the potential visual impact is equal to the *consequence* multiplied by the *probability* of the impact occurring, where the consequence is determined by the sum of the individual scores for magnitude, duration, and extent (i.e., *significance = consequence (magnitude + duration + extent) x probability*).

The significance weighting for each potential visual impact (as calculated above) is as follows:

- <30 points: Low (where the impact would not have a direct influence on the decision to develop in the area)
- 31-60 points: Medium / moderate (where the impact could influence the decision to develop in the area)
- >60: High (where the impact must have an influence on the decision to develop in the area)

7.3. Visual Impact Assessment

The identification and assessment of environmental impacts is a multi-faceted process, using a combination of quantitative and qualitative descriptions and evaluations. It involves applying scientific measurements and professional judgement to determine the significance of environmental impacts associated with the proposed project. The process involves consideration of, inter alia: the purpose and need for the Project; views and concerns of interested and affected parties (I&APs); social and political norms, and the public's interest.

The following tables summarise the consequence and significance of the visual impact of the Project. These results are based on worst-case scenario when the impacts of all aspects of the Project are taken together. Consequence of impact is a function of intensity, duration, and spatial extent (SLR 2020). Intensity of impact is taken from the worst-case situation. These facilities are rated together, from a visual impact perspective, as the one would not exist without the other and they must be understood as the collective / cumulative.

7.3.1. Construction Phase

Table 2: Construction of a 45m high 100m² Mast
The visual impact for the construction will occur on a local scale. During construction, there may be an increase in heavy vehicles utilising the roads to the mast that may cause, at the very least, a visual nuisance to other road users and landowners in the area. Construction equipment such as cranes could be visually intrusive, albeit for a short time period. Site (Servitude) clearing and removal of vegetation could partially alter the landscape as viewed from the surrounds of the site, with the emergence of an exposed strip of bare soil. During construction, the area around the towers will be disturbed. The construction camps and lay-down yards are anticipated to disturb a much larger area.

[2] Long distance = > 3km. Medium to longer distance = 1.5 – 3km. Short distance = 0.5 – 1.5km. Very short distance = < 0.5km (refer to Section 6.3. Visual distance / observer proximity to the mast).
[3] This value is read from the visual impact index. Where more than one value is applicable, the higher of these will be used as a worst case scenario.

Construction activities may potentially result in a **low** (significance rating = 28), temporary visual impact, that may be mitigated to **very low** (significance rating = 18).

	Rating	Motivation	Significance
Prior to Mitigation			
Duration	Short (2)	Changes in the physical characteristics by changing the fabric and character of the landscape	**Low (27)**
Extent	Short Distance (3)	Partial loss of features that contribute to the existing landscape by the introduction of new elements and structures	
Magnitude	Low (4)		
Probability	Probable (3)	If development is approved there is a probability the landscape will be impacted	

Mitigation/Enhancement Measures

Mitigation:

- Retain and maintain natural vegetation (if present) immediately adjacent to the development footprint.
- Ensure that vegetation cover adjacent to the development footprint (if present) is not unnecessarily removed during the construction phase, where possible.
- Plan the placement of laydown areas and temporary construction equipment camps to minimise vegetation clearing (i.e., in already disturbed areas) wherever possible.
- Restrict the activities and movement of construction workers and vehicles to the immediate construction site and existing access roads.
- Ensure that rubble, litter, and disused construction materials are appropriately stored (if not removed daily) and then disposed regularly at licensed waste facilities.
- Reduce and control construction dust using approved dust suppression techniques as and when required (i.e., whenever dust becomes apparent).
- Restrict construction activities to daylight hours whenever possible to reduce lighting impacts.
- Rehabilitate all disturbed areas (if present / if required) immediately after the completion of construction works.
- Take land use into consideration when choosing pylon types, it is recommended that smaller footprint pylons be used in cultivated areas;
- Spread absorbent sand on areas where oil spills are likely to occur, such as the refuelling area in the hard park; Oil-contaminated soils are to be removed to a contained storage area and bioremediated or disposed of at a licensed facility;

Post Mitigation/Enhancement Measures			
Duration	Short (2)	Changes in the physical characteristics by changing the fabric and character of the landscape	**Low (18)**
Extent	Very Short (1)	Partial loss of features that contribute to the existing landscape by the introduction of new elements and structures	
Magnitude	Minor (3)		
Probability	Probable (2)	If development is approved there is a small probability the landscape will be impacted	

Cumulative Impacts:

The construction of the mast is expected to increase the cumulative visual impact within the region, considering the visual exposure of the powerlines and other infrastructure already present at this locality

Residual Risks:

The visual impact will be removed after decommissioning, provided the Mast infrastructure is removed and the site is rehabilitated to its original (current) status. Failing this, the visual impact will remain.

Table 3: Impact of Mast on Roads in Close Proximity

There is an extensive network of provincial tar roads that form the access backbone to the study area. Secondary district dirt roads provide access to all the more rural areas, plantations and farms through which the proposed lines will pass. Access to the proposed mast only need to be constructed where there are no existing roads and for the last short distances on private

land serviced by the existing road network.

Other roads in the area provide linkages between different rural settlements and are generally of a poor standard and poorly maintained. This prevents physical integration and encourages segregation due to physical constraints and distances between settlements.

The area has existing infrastructure, such as power lines and pylons which will have set a level of acceptance for this type of development. The extent of the disturbances will generally affect a relatively small footprint area.

Considering the moderately low VAC throughout most of the study area, the disturbed condition of parts of the landscape and the recovery rate of the endemic vegetation, the severity of landscape impact during the construction stage is expected to be moderate. Surface disturbances are also minimised through, for example, utilising existing roads.

	Rating	Motivation	Significance
Prior to Mitigation			
Duration	Long term (4)	Development of the roads as well as the MAST infrastructure and servitude will be maintained and exist for the entire life cycle.	**Moderate (39)**
Extent	Local (3)	Only road users in the area will be subjected to the impact	
Magnitude	Moderate (6)		
Probability	Probable (3)	Road users, although not primary roads will most likely be able to see the MAST when traversing parts of the development.	

Mitigation/Enhancement Measures

Mitigation:

Mitigation of this impact is not possible therefore additional specific measures as well as general "best practice" measures are recommended to reduce / mitigate the potential visual impact to **low**. The table below illustrates this impact assessment.

General mitigation / management:

Planning:

- Retain and maintain natural vegetation in all areas outside of the development footprint.

Operations:

- Maintain the general appearance of the surrounding environment.
- For access / service roads and servitudes avoid straight edges and corridors. These lines should complement the landscape through which they pass
- Avoid unnecessary removal of vegetation cover. Use existing access roads as far as possible; If a new road is constructed, ensure that some measure of erosion prevention is followed.

Post Mitigation/Enhancement Measures			
Duration	Long Term (4)	Development of the MAST will be visible for its entire lifespan	**Low (27)**
Extent	Local (3)	Only road users in the area will be subjected to the impact	
Magnitude	Low (2)		
Probability	Probable (3)	Vegetation will shield any possible visual intrusion	

Cumulative Impacts:

The construction of the mast is expected to increase the cumulative visual impact within the region, considering the visual exposure of the already present at this locality.

Residual Risks:

The visual impact will be removed after decommissioning, provided the MAST infrastructure is removed and the site is rehabilitated to its original (current) status. Failing this, the visual impact will remain.

Table 4: Visual Impact on Residence and Homesteads in Close Proximity

The visibility of the proposed mast will vary between static and dynamic view types. In the case of static views, such as views from a farmhouse or homestead, the visual relationship between the proposed mast and the landscape will not change. The cone of vision is relatively wide, and the viewer tends to scan back and forth across the landscape. In contrast views from a moving vehicle are dynamic as the visual relationship between the mast infrastructure is constantly changing as well as the visual relationship between mast and the landscape in which they are seen.

Additional sensitive visual receptors are located at the farm residences (homesteads) throughout the study area. It is expected that the viewer's perception, unless the observer is associated with (or supportive of) the mast, would generally be negative. Due to the very remote location of the proposed development and the ill populated nature of the receiving environment, there are only seven potential sensitive visual receptor sites located within the study area.

Where homesteads and settlements occur, some more significant vegetation and trees may have been planted, which would contribute to the visual absorption capacity (i.e. shielding the observers from the infrastructure). As this is not a consistent occurrence, however, VAC will not be taken into account for any of the homesteads or settlements, thus assuming a worst-case scenario in the impact assessment.

	Rating	Motivation	Significance
Prior to Mitigation			
Duration	Long term (4)	The residence surrounding the development will be able to see the powerline for the duration of its lifecycle	**Moderate (42)**
Extent	Local (4)	The development is proposed to only disrupt local visual receptors	
Magnitude	Moderate (6)		
Probability	Probable (3)	Residence will most likely be able to see the MAST especially in areas where the topography allows	
Mitigation/Enhancement Measures			
Mitigation: **General mitigation/management:** Planning: • Retain and maintain natural vegetation in all areas outside of the development footprint. Operations: • Maintain the general appearance of the facility as a whole. Decommissioning: • Remove infrastructure not required for the post-decommissioning use of the facility. • Rehabilitate all areas. Consult an ecologist regarding rehabilitation specifications. • Monitor rehabilitated areas post-decommissioning and implement remedial actions.			
Post Mitigation/Enhancement Measures			
Duration	Long term (4)	The MAST will be visible for its entire lifespan	**Low (24)**
Extent	Local (4)	The development is proposed to only disrupt local visual receptors	
Magnitude	Low (4)		
Probability	Probable (3)	With the correct mitigation measures in place, it is highly unlikely that there would be permanent impact on local residence	
Cumulative impacts: The construction of the MAST is expected to increase the cumulative visual impact within the region, considering the visual exposure of the power line infrastructure already present at this locality.			
Residual Risks: None			

7.3.2. Operation Phase

Table 5: Visual Exposure

Visual exposure is determined by qualifying the visibility of an object, with a distance rating to indicate the degree of intrusion and visual acuity. As distance between the viewer and the object increases, the visual perception of the object reduces exponentially as generally changes in form, line, colour, and texture in the landscape become less perceptible with increasing

distance.

It is expected that the mast may theoretically be visible within their respective 3km visual corridors and potentially highly visible within a 0.5 – 1.5km radius of the structure due to the generally flat terrain it traverses. Beyond 1.5km the visibility becomes more scattered due to the undulating nature of the topography as well as the presence of hills and ridges. Although the majority of the exposed areas fall within vacant open space, generally devoid of observers or potential sensitive visual receptors.

	Rating	Motivation	Significance
Prior to Mitigation			
Duration	Long term (4)	The development will be visible for its life cycle duration	**Moderate (42)**
Extent	Local (4)	Visual receptors within the local area will be subjected to this impact	
Magnitude	Moderate (6)		
Probability	Probable (3)	Without mitigation there is a high level of certainty that this impact will take place	
Mitigation/Enhancement Measures			

Mitigation:

General mitigation/management:

Planning:

- Retain and maintain natural vegetation in all areas outside of the development footprint.

Operations:

- Maintain the general appearance of the facility as a whole.

Decommissioning:

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

Site specific mitigation measures:

- The mitigation measures for the mast during operation will need to focus on effective rehabilitation of the work sites. These specifications must be explicit and detailed and included in the contract documentation (Environmental Management Plan) so that the tasks can be costed and monitored for compliance and result.
- The galvanising of the mast should be allowed to weather to a matt grey finish rather than be painted silver, as is often the case.
- Should it be necessary to paint, it is recommended that a neutral matt finish be used.

Post Mitigation/Enhancement Measures			
Duration	Long term (4)	The development will be visible for its life cycle duration	**Low (24)**
Extent	Local (4)	Visual receptors within the local area will be subjected to this impact	
Magnitude	Low (4)		
Probability	Improbable (2)	With Mitigation this impact is likely to be significantly reduced	

Cumulative Impacts:

The construction of the MAST is expected to increase the cumulative visual impact within the region, considering the visual exposure of the power line infrastructure already present at this locality.

Residual Risks:

None

Table 6: Sense of place

Sense of place refers to a unique experience of an environment by a user, based on his or her cognitive experience of the place. Visual criteria, specifically the visual character of an area (informed by a combination of aspects such as topography, level of development, vegetation, noteworthy features, cultural / historical features, etc.), plays a significant role.

An impact on the sense of place is one that alters the visual landscape to such an extent that the user experiences the environment differently, and more specifically, in a less appealing or less positive light.

The environment surrounding the proposed MAST has a predominantly rural and undeveloped character. These generally undeveloped landscapes are considered to have a high visual quality.

The anticipated visual impact of the proposed MAST on the regional visual quality, and by implication, on the sense of place, is difficult to quantify, but is generally expected to be of **low** significance. This is due to the relatively low viewer incidence within close proximity to the proposed development site and the presence of existing activities within the region.			
	Rating	**Motivation**	**Significance**
Prior to Mitigation			
Duration	Long term (4)	The development will be visible for its life cycle duration	**Low (22)**
Extent	Regional (3)	Visual receptors within the local area will be subjected to this impact	
Magnitude	Low (4)		
Probability	Improbable (2)	There is a small chance that this will impact visual receptors.	
Mitigation/Enhancement Measures			
Mitigation: • For access / service roads and servitudes avoid straight edges and corridors. These lines should complement the landscape through which they pass (Litton, 1980). • Special attention should be focussed on the width of servitude actually required for the construction and operational phases. There is a tendency to make these servitudes wider than necessary. • access roads built to a higher engineering specification than required for a single lane 4x4 maintenance vehicle track. • Vegetation stripping should be done in a manner where the edges are organic (non-geometric) or curvilinear rather than straight or sharp edged as viewers tend to form positive visual impressions such as "gentleness" and "delicacy" and tend to object to negative visual impressions such as "rough", "rugged" or "violent" (Ribe, 1989). • It is essential that all cut and fill slopes, as well as all areas disturbed by construction activity, are suitably topsoiled and vegetated as soon as is possible after final shaping. The progressive rehabilitation measures will allow the maximum growth period before the completion of the project. • All areas affected by the construction works will need to be rehabilitated and re-vegetated. This includes the areas beyond the works area such as temporary access roads, construction campsites, workers campsites, borrow pits, laydown areas, etc. • The special conditions of contract must include for the stripping and stockpiling of topsoil from the construction areas for later re-use. Topsoil is considered to be at least the top 300 mm of the natural soil surface and includes grass, roots and organic matter. • The areas to be cleared of topsoil should be all areas that will be covered by structures, roads and construction camps. • The presence of degraded and disused roads and areas left over after development that are not rehabilitated, could present a high perceptual visual impact. These areas should be topsoiled and re-vegetated. • All existing large trees that fall outside the earthworks area must be retained.			
Post Mitigation/Enhancement Measures			
Duration	N/A		
Extent	N/A		
Magnitude	N/A		
Probability	N/A		
Cumulative impacts: The combined effects of these changes will negatively affect the overall character of the landscape.			
Residual Risks:			

7.3.3. Cumulative Effects

Cumulative landscape and visual effects (impacts) result from additional changes to the landscape or visual amenity caused by the proposed development in conjunction with other developments (associated with or separate to it), or actions that occurred in the past, present or are likely to occur in the foreseeable future. They may also affect how the landscape is experienced. Cumulative effects may be positive or negative. Where they comprise a range of benefits, they may be considered to form part of the mitigation measures.

Cumulative effects can also arise from the intervisibility of a range of developments and /or the combined effects of individual components of the proposed development occurring in different locations or over some time. The separate effects of such individual components or developments may not be significant, but together they may create an unacceptable degree of adverse effect on visual receptors within their combined visual envelopes. Intervisibility depends upon general topography, aspect, tree cover or other visual obstruction, elevation, and distance as this affects visual acuity, which is also influenced by weather and light conditions (LI-IEMA (2013)).

Cumulative effect of the Project

The cumulative impact of the Project, the facilities and infrastructure taken together, is significant, along with the existing power infrastructure that exists in the study area. Intervisibility for the proposed Project and the existing infrastructure would be evident. The VAC for the study area is relatively low, and the combined effect over time of these developments would result in the study area being impacted upon in a moderate manner beyond the anticipated negative impacts of the proposed Project alone.

Table 7: Cumulative Impact

Nature of Impact: The potential cumulative visual impact of the MAST on the visual quality of the landscape.		
	Overall impact of the proposed project considered in isolation. (With mitigation)	***Cumulative impact of the project and other projects within the area (with mitigation)***
Extent	Long Distances **(1)**	Long distance **(1)**
Duration	Long term **(4)**	Long term **(4)**
Magnitude	Moderate **(6)**	Low **(4)**
Probability	Probable **(4)**	Probable **(3)**
Significance	Moderate **(44)**	Low **(27)**
Status (positive, neutral, or negative)	Negative	Negative
Reversibility	Reversible **(1)**	Reversible **(1)**
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	No, only best practise measures can be implemented	
Generic best practise mitigation/management measures: Planning: ➢ Retain/re-establish and maintain natural vegetation (if present) immediately adjacent to the development footprint where possible. Operations: ➢ Maintain the general appearance of the development area as a whole. Decommissioning: ➢ Remove infrastructure not required for the post-decommissioning use. ➢ Rehabilitate all affected areas. Consult an ecologist regarding rehabilitation specifications.		
Residual impacts: The visual impact will be removed after decommissioning. Failing this, the visual impact will remain.		

7.4. Impact Statement

In order to better understand the visual impacts associated with the proposed mast on receptor locations in the surrounding areas, a visual contrast assessment has been undertaken. This is done in order to quantify the degree of visual contrast or change that would be caused by the proposed ash disposal facility at certain key observation locations.

Empirical research indicates that the visibility of a telecommunications tower, and hence the severity of visual impact, decreases as the distance between the observer and the tower increases. The landscape type, through which the transmission line crosses, can be mitigated through the topographical or vegetative measures.

In some cases, the tower may dominate the view for example, silhouetted against the skyline, or in some cases be

absorbed in the landscape. A complex landscape setting with a diverse land cover and topographical variation has the ability to decrease the severity of visual impact more than a mundane landscape (Bishop et al, 1985).

Visual receptors within 1 km from the alignment are most likely to experience the highest degree of visual intrusion, hence contributing to the severity of the visual impact. This is considered as the zone of highest visibility after which the degree of visual intrusion decreases rapidly at distances further away.

The anticipated visual impact is not considered to be a fatal flaw from a visual perspective, considering the low incidence of visual receptors occurring within the region.

The following is a summary of impacts remaining, assuming mitigation as recommended, is exercised:

- During construction, there may be a noticeable increase in heavy vehicles utilising the roads to the development site that may cause, at the very least, a visual nuisance to other road users and landowners in the area. Construction activities may potentially result in low, temporary visual impact that may be mitigated to **low**.

- The MAST is expected to have a **moderate** (to potentially **high**) visual impact on observers travelling along the secondary roads. Some homesteads and other visual receptors are found in the area. The impacts may be contained to **Low** significance if the proposed impact mitigation measures are implemented.

- The anticipated visual impact resulting from the construction of on-site ancillary infrastructure is likely to be of **low** significance both before and after mitigation.

- The anticipated visual impact of the proposed MAST on the regional visual quality, and by implication, on the sense of place, is difficult to quantify, but is generally expected to be of **low** significance. This is due to the relatively low viewer incidence within close proximity to the proposed development site and the presence of existing mining and industrial activities within the region.

- The anticipated cumulative visual impact of the proposed MAST is expected to be of **low** significance.

The anticipated visual impacts listed above (i.e., post mitigation impacts) range from **moderate** to **low** significance. **Anticipated visual impacts on sensitive visual receptors (if and where present) in close proximity to the proposed facility are not considered to be fatal flaws for the proposed MAST and Facility.**

Considering all factors, it is recommended that the development of the facility as proposed be supported; subject to the implementation of the recommended mitigation measures (**Section 7.4.**) and management programme (**Section 9.**).

8. CONCLUSION

The sensitivity of the landscape character is an indication of "the degree to which a particular landscape can accommodate change from a particular development, without detrimental effects on its character" (GLVIA, 2002). The uncluttered openness of the landscape is greatly responsible for the simplistic and essentially secluded landscape character. Vast uninterrupted landscapes and vistas are dominated by low growing and low stunted vegetation. The unspoilt, panoramic landscape is an amenity that greatly contributes to the pristine and remote character of the landscape.

Previous human induced activities and interventions have minimally impacted the original landscape character. In this case, existing infrastructure, including power lines, roads, amongst others, can be classified as landscape disturbances and elements that cause a reduction in the condition of the affected landscape type and negatively affect the quality of the visual resource.

The significance of visual impact is based on the worst-case scenario This assumption is also based on the nature of the visual impact and the fact that receptors would experience all facilities in the same visual envelope from their respective locations or as they travel along adjacent roads.

The cause of these anticipated visual impacts would be:

Construction Phase:

- Removal of vegetation, the building of access roads, earthworks, and exposure of earth to establish the areas to be developed.
- Physical presence of construction camps and the movement of construction vehicles within the site and along local roads.
- Generation of dust by construction activities.

Operational Phase

- Reduction in the rural sense of place for the study area.
- Light pollution.

Decommissioning Phase

- Physical presence of the activities associated with removing the structures and rehabilitating the site.

9. MITIGATION AND MANAGEMENT MEASURES

In considering mitigation measures three rules are considered - the measures should be feasible (economically), effective (how long will it take to implement and what provision is made for management / maintenance), and acceptable (within the framework of the existing landscape and land use policies for the area). To address these, the following principles have been established:

- Mitigation measures should be designed to suit the existing landscape character and needs of the locality.
- They should respect and build upon landscape distinctiveness.
- It should be recognized that many mitigation measures, especially the establishment of planted screens and rehabilitation, are not immediately effective.

The primary visual impact, namely the appearance of the MAST is not possible to mitigate. The functional design of the MAST cannot be changed in order to reduce visual impacts. Mitigation is however possible if the recommended general actions are followed.

9.1. Preparatory Works and Construction Concerns

Mitigation of visual impacts associated with the construction phase, albeit temporary, would entail proper planning, management, and rehabilitation of the construction site. Recommended mitigation measures include the following:

- Ensure that vegetation is not unnecessarily cleared or removed during the construction period.
- Reduce the construction period through careful logistical planning and productive implementation of resources.
- Plan the placement of lay-down areas and any potential temporary construction camps in order to minimise vegetation clearing (i.e., in already disturbed areas) wherever possible.
- Restrict the activities and movement of construction workers and vehicles to the immediate construction site and existing access roads.
- Ensure that rubble, litter, and disused construction materials are appropriately stored (if not removed daily) and then disposed regularly at licensed waste facilities.
- Reduce and control construction dust through the use of approved dust suppression techniques as and when required (i.e., whenever dust becomes apparent).
- Restrict construction activities to daylight hours in order to negate or reduce the visual impacts associated with lighting.
- Rehabilitate all disturbed areas, construction areas, roads, slopes, etc. immediately after the completion of construction works. If necessary, an ecologist should be consulted to assist or give input into rehabilitation specifications.
- With the preparation of the portions of land onto which activities will take place the minimum amount of existing vegetation and topsoil should be removed. Large trees should be saved were possible, specifically along the highways.
- Ensure, wherever possible, natural indigenous vegetation is retained and incorporated into the site rehabilitation.
- All topsoil that occurs within the proposed footprint of an activity must be removed and stockpiled for later use. The construction contract must include the stripping and stockpiling of topsoil. Topsoil would be used later during the rehabilitation phase of disturbed areas. The presence of degraded areas and disused construction roads, which are not rehabilitated, will increase the overall visual impact.
- Specifications with regards to the placement of construction camps, as well as a site plan of the construction camp, indicating waste areas, storage areas, and placement of ablution facilities should be included in the EMPr. These areas should either be screened or positioned in areas where they would be less visible from human settlements and main roads.
- Construction activities should be limited to between 08:00 and 17:00 or in conjunction with the ECO.
- Adopt responsible construction practices aimed at strictly containing the construction / establishment activities to specifically demarcated areas.

- Building or waste material discarded should be undertaken at an authorised location, which should not be within any sensitive areas.

9.2. Earthworks

- Earthworks should be executed in such a way that only the footprint and a small 'construction buffer zone' around the proposed activities are exposed. In all other areas, the naturally occurring vegetation should be retained, especially along the periphery of the sites.
- All cut and fill slopes (if any) and areas affected by construction work should be progressively top soiled and re-vegetated as soon as possible.
- Any soil must be exposed for the minimum time possible once cleared of vegetation to avoid prolonged exposure to wind and water erosion and to minimise dust generation.

9.3. Landscaping and Ecological Approach

- It is recommended that the existing vegetation cover be maintained / established in all areas outside of the actual development footprint, both during construction and operation of the proposed facility. This will minimise visual impact as a result of cleared areas, mast areas denuded of vegetation.
- Where new vegetation is proposed to be introduced to the site, an ecological approach to rehabilitation as opposed to a horticultural approach should be adopted. For example, communities of indigenous plants will enhance biodiversity, a desirable outcome for the area. This approach can significantly reduce long-term costs as less maintenance would be required over conventional landscaping methods as well as the introduced landscape being more sustainable.
- Progressive rehabilitation of all construction areas should be carried out immediately after they have been established.
- Undertake planting of screening vegetation along the eastern and southern boundaries of the Project sites.

9.4. Mounting Structures and Associated Infrastructure

- Paint the mounting structures with colours that reflect and compliment the colours of the surrounding landscape.
- Ensure the perimeter fence is of a 'see through' variety and that its colour blends with the environment.

9.5. Good housekeeping

- "Housekeeping" procedures should be developed for the Project to ensure that the Project site and lands adjacent to the Project site are kept clean of debris, garbage, graffiti, fugitive trash, or waste generated onsite; procedures should extend to control "track out" of dirt on vehicles leaving the active construction site and controlling sediment in stormwater runoff.
- During construction, temporary fences surrounding the material storage yards and laydown areas should be covered with 'shack' cloth (khaki coloured).
- Operating facilities should be actively maintained during operation.

9.6. Operation Phase

- During operation, the maintenance of the MAST and Facility, ancillary structures and infrastructure will ensure that the facility does not degrade, preventing aggravation of the visual impact. Roads must be maintained to forego erosion and to suppress dust, and rehabilitated areas must be monitored for rehabilitation failure. Remedial actions must be implemented as and when required. Once the facility has exhausted its life span, the main facility and all associated infrastructure not required for the post rehabilitation use of the site should be removed and all disturbed areas appropriately rehabilitated. An ecologist should be consulted to give input into rehabilitation specifications. All rehabilitated areas should be monitored for at least a year following decommissioning, and remedial actions implemented as and when required. Where sensitive visual receptors are likely affected, it is recommended that the developer enter into negotiations regarding the potential screening of visual impacts, either at the receptor site or along the perimeter of the facility. This may entail the planting of vegetation or the construction of landscaped berms or screens.

9.7. Lighting

Light pollution is largely the result of bad lighting design, which allows artificial light to shine outward and upward into the sky, where it is not wanted, instead of focusing the light downward, where it is needed. Ill- designed lighting washes out the darkness of the night sky and radically alters the light levels in rural areas where light sources shine as 'beacons' against the dark sky and are generally not wanted.

Of all the pollutions faced, light pollution is perhaps the most easily remedied. Simple changes in lighting design and installation yield immediate changes in the amount of light spilled into the atmosphere. The following are measures that must be considered in the lighting design of the Project, particularly at the management and service platforms:

Mitigation measures include the following:

- Shielding the sources of light by physical barriers (walls, vegetation, or the structure itself).
- Limiting mounting heights of lighting fixtures, or alternatively using footlights or bollard level lights.
- Making use of downward directional lighting fixtures.
- Making use of minimum lumen or wattage in fixtures.
- Making use of down-lighters, or shielded fixtures.
- Making use of Low-Pressure Sodium lighting or other types of low impact lighting.
- Making use of motion detectors on security lighting. This will allow the site to remain in relative darkness, until lighting is required for security or maintenance purposes.

In terms of ancillary infrastructure, it is recommended that access roads and other on-site infrastructure be planned so that the clearing of vegetation is minimised. Consolidate infrastructure as much as possible and make use of already disturbed areas rather than pristine sites, wherever possible. Mitigation of lighting impacts includes the pro-active design, planning and specification lighting for the facility. The correct specification and placement of lighting and light fixtures for the proposed MAST will go far to contain rather than spread the light.

9.8. Branding and Marketing

The applicants may wish to give consideration, where appropriate, to the development and installation of viewing areas, interpretation panels, visitor, or educational facilities as part of the development proposal. This may appeal to tourists visiting the area who may be curious about renewable energy projects.

10. REFERENCES

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