



## Report:

Visual impact assessment report for the proposed residential development on a portion of the farm Vaale Valley 219, Mossel Bay

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## GLOSSARY

Aesthetics	Relates to the pleasurable characteristics of a physical environment as perceived through the five senses of sight, sound, smell, taste, and touch.
Adverse visual impact	Any modification in landforms, water bodies, vegetation or any introduction of structures which negatively impacts the visual character of the landscape and disrupts the harmony of the basic elements (i.e. form, line, colour and texture).
Basic elements	The four design elements (form, line, colour and texture) which determine how the character of a landscape is perceived.
Contrast	Opposition or unlikeness of different forms, lines, colours or textures in a landscape and therefore the degree to which project components visually differs from its landscape setting.
Colour	The property of reflecting light of a particular intensity and wavelength (or a mixture of wavelengths) to which the eye is sensitive. It is the major visual property of surfaces.
Form	The mass or shape of an object(s) which appears unified, such as a vegetative opening in a forest, a cliff formation or a water tank.
Integration	The degree to which a development component can be blended into the existing landscape without necessarily being screened from view.
Interfluve	The area of higher ground which separates two rivers/watercourses which flow into the same drainage system
Key viewing locations	One or more points on a travel route, use area or a potential use area, where the view of a management activity would be most revealing.
Landscape character	The arrangement of a particular landscape as formed by the variety and intensity of the landscape features and the four basic elements of form, line, colour and texture. These factors give the area a distinctive quality which distinguishes it from its immediate surroundings.
Landscape features	Land and water form, vegetation and structures which compose the characteristic landscape.
Line	The path (real or imagined) that the eye follows when perceiving abrupt differences in form, colour or texture. Within landscapes, lines may be found as ridges, skylines, structures, changes in vegetative types or individual trees and branches.
Micro-topography	Small scale variations in the height and roughness of the ground surface; in the context of this report the definition includes structures such as buildings and larger-sized vegetation that can restrict views
Mitigation measures	Methods or procedures designed to reduce or lessen the adverse impacts caused by management activities.
Mountain, hill or ridge	Is a physical landscape feature, elevated above the surrounding landscape. It includes the foot/base, slopes and crest of the mountain, hill or ridge
Rehabilitation	A management alternative and/or practice which restores landscapes to a desired scenic quality.
Ridgelines	Ridgelines are defined as the line formed by the meeting of the tops of sloping surfaces of land. Significant ridgelines are ridgelines which, in general, are highly

	visible and dominate the landscape.
Scale	The proportionate size relationship between an object and the surroundings in which the object is placed.
Sense of place	The unique quality or character of a place, whether natural, rural or urban and relates to uniqueness, distinctiveness or strong identity. It is also sometimes referred to as genius loci meaning 'spirit of the place.
Texture	The visual manifestations of the interplay of light and shadow created by the variations in the surface of an object or landscape.
Visual modification	A measure of the visual interaction between a development and the landscape setting within which it is located.
Viewshed	The creation of a computer generated probable viewshed to define the extent to which the planned infrastructure is visible from key viewing locations.
Visual Sensitivity	The degree to which a change to the landscape will be perceived adversely.
Visual Impact	A measure of joint consideration of both visual sensitivity and visual modification

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# 1. INTRODUCTION

## 1.1 General

Visual impact assessments should not be an obstacle in the approval process of a proposed development. Visual input, especially at the early concept stage of the project, can play an important role in helping to formulate design alternatives, as well as minimising impacts, and possibly even costs, of the project

It is in the nature of visual and scenic resources to include abstract qualities and connotations that are by their nature difficult to assess or quantify as they often have cultural or symbolic meaning. An implication of this is that impact ratings cannot simply be added together. Instead, the assessment relies on the evaluation of a wide range of considerations, both objective and subjective, including the context of the proposed project within the surrounding area.

The analysis of the interaction between the existing visual environment and the planned infrastructure provides the basis for determining visual impacts and mitigation strategies. This visual impact assessment provides an overview of the landscape character of the locality and assesses the degree to which the proposed development would be visually appropriate.

## 1.2 Methodology

### 1.2.1 The sequence of work employed in this study

A desktop survey using 1:50,000 topographical survey maps, Google Earth, and ArcMap (Esri, ArcGIS software) was undertaken. Following the desktop information gathering process, a site visit was conducted to test the conclusions of the terrain analysis, identify receptors and appraise the local landscape.

The methodology employed by this visual assessment is based on the following methodologies:

- The United States Department of Agriculture: Forestry Service - *Landscape Aesthetics*;
- The United States Bureau of Land Management Visual Resources Management;
- The Landscape Institute and the Institute of Environmental Management & Assessment - *Guidelines for Landscape and Visual Impact Assessment*; and
- The Provincial Government of the Western Cape's Guideline for involving visual and aesthetic specialists in EIA processes and the *Guidelines for Landscape*

### 1.2.2 Written and drawn material was made available

- Hartland Estate marketing material
- Visual Impact Assessment Terms of Reference

### 1.2.3 Receiving site

The receiving site was assessed, and areas of the locality from where the development appeared to be likely visible, adjacent lands, and local roads.

This study was conducted in September 2022. The weather on the days of the site visit was clear and open. A photographic survey of the site and surrounding areas was carried out.

The visual assessment was undertaken using standard criteria such as geographic view-sheds and viewing distances as well as qualitative criteria such as compatibility with the existing landscape character and settlement pattern. Potentially sensitive areas were assessed, and mitigation measures were evaluated.

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## 1.3 Assumptions and limitations

It should be noted that the 'experiencing' of visual impacts is subjective and largely based on the perception of the viewer or receptor. The presence of a receptor in an area potentially affected by the proposed development does not thus necessarily mean that a visual impact would be experienced.

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 be a perception of a visual impact if the landscape becomes subject to visual alteration. 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 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 practised tending to affect the perception of whether landscape change (through development) would be considered an unwelcome intrusion.

The abovementioned landscape values can be interlinked, but can also be conflicting, e.g. amenity values associated with a landscape held by a certain group of people as described above may conflict with economic values associated with the market or development possibility of the landscape that is held by others. It is in this context that visual impact associated with a potential development often arises as an issue in environmental impact assessments.

### 1.3.1 Data

The best currently and readily available datasets were utilized for the visual impact assessment. It is important to note that variations in the quality, format and scale of available datasets could limit the scientific confidence levels of the visual impact assessment outcomes.

### 1.3.2 Viewshed analysis

Slope and aspect are very important in the context of views. Topography expressed in the form of slope and aspect can perform an important role in limiting views or 'focusing' views in a certain direction. Viewers located low down within an enclosed valley would experience a limited visual envelope or viewshed, as the rising topography around them would prevent wider views of the surrounding terrain beyond the immediate valley.

Similarly, an object placed lower down in such an enclosed valley would have a limited viewshed, being shielded or partly shielded by the terrain surrounding it. A viewer located on a hill slope with a certain aspect would only be able to view the surrounding terrain in the direction of the aspect of the slope. Conversely, a viewer on a higher-lying interfluvium will be exposed to potentially wide-ranging views over the surrounding terrain, and large objects placed in these terrain settings could similarly be visible from a wide area.

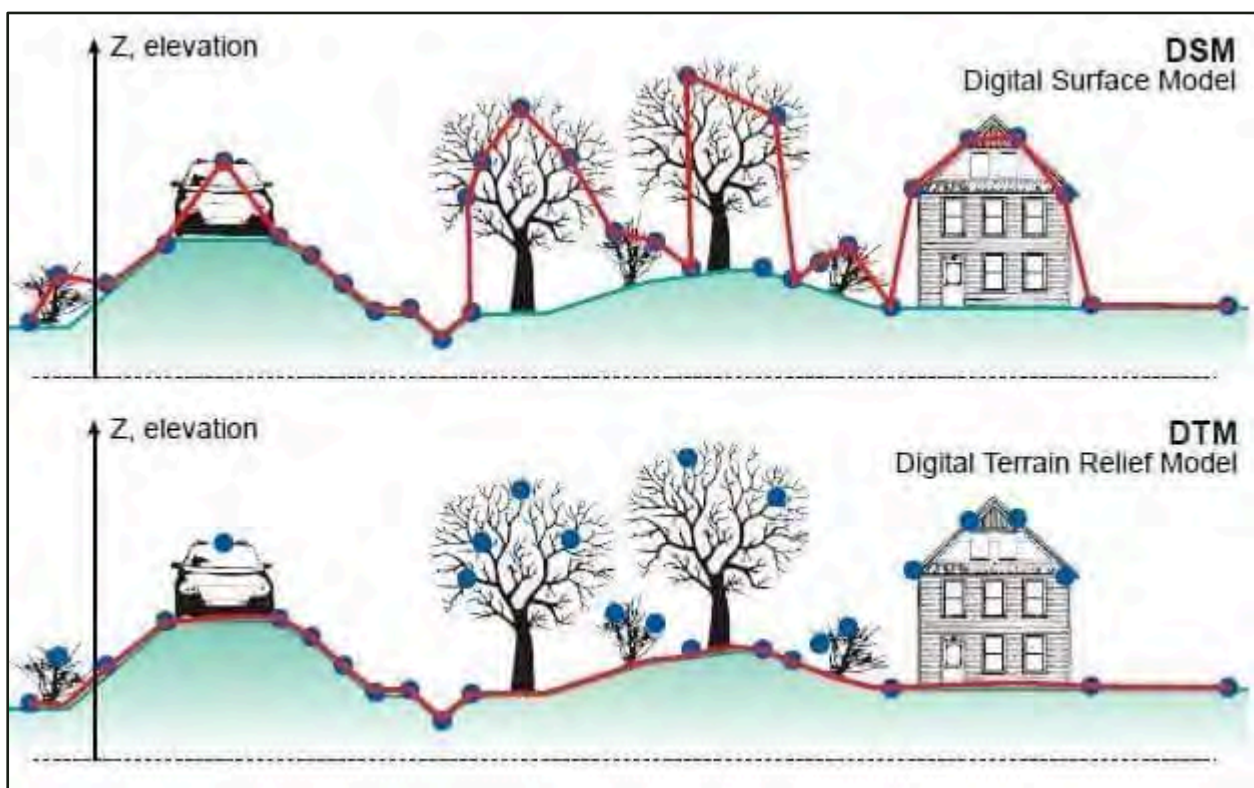
The micro-topography within the landscape setting in which the viewer and object are located is also important. The presence of micro-topographical features and objects such as buildings or vegetation that would screen views from a receptor position to an object can remove any visual impact factor associated with it.

Fischer (1995) analysed the effects of data errors on viewsheds calculated by Geographic Information Systems and has shown that the calculations are extremely sensitive to small errors in the data and the resolution of the data and the errors in viewer location and elevation. Other studies have also shown that

a viewshed calculated using the same data but with eight different Geographic Information Systems can produce eight different results.

Hankinson (1999) also states that viewsheds are never accurate, and they contain several sources of error and may not always be feasible to separate these errors or to estimate their size and potential effects. It is, therefore, better to describe a viewshed analysis as a probable view-shed that must be subjected to subsequent field testing and verification.

A probable viewshed can be based on topography only and shows areas that will be screened by intervening hills, mountains etc. A probable topographic (digital terrain relief model) view-shed does not consider heterogeneous and complex natural and man-made elements in the surrounding landscape (Figure 1). A digital terrain model (DTM) can be created from existing contour data. A viewshed based on a digital surface model (DSM) does consider intervening vegetation, buildings or small variations in topography, such as road cuttings (Figure 1). Digital surface models are expensive and not a viable option for small projects



**Figure1:** Terrain models

Therefore, a probable viewshed is a conservative assessment of those areas that may be visually impacted by the planned infrastructure. Increasing sophistication/accuracy of the probable viewshed by the addition of data (DSM) on complex natural and man-made elements in the landscape is desirable, but it will introduce further errors of detail and interpretation in the viewshed analysis.

### 1.3.3 Visualisation

It must be remembered that any visualisation (3D models, photomontages, photos and maps) of complex natural and man-made elements produce perceptions, interpretations and value judgements that are not always consistent with those that would be produced by actual encounters with the elements represented. Visualisations should, therefore, be considered an approximation of the three-dimensional visual experiences that an observer would receive in the field and must be subjected to subsequent field testing and verification



Photomontage is the superimposition of an image onto a photograph to create a realistic representation of proposed or potential changes to any view. The overall aim of photography and photomontage is to represent the landscape context under consideration and the proposed development, both as accurately as is practical. It must be kept in mind that the human eye sees differently than a camera lens, both optically and figuratively.

The focusing mechanisms of human eyes and camera lenses are different. Human vision is binocular, and dynamic compared to a camera that tends to flatten an image.

## 2. APPLICABLE POLICIES AND GUIDELINES

Several government policies and plans, guidelines, environmental management instruments and other decision-making instruments are relevant to the site and development and have been reviewed. These include:

### 2.1 The Western Cape Provincial Spatial Development Framework (PSDF)

Makes provision for:

- the protection and sustainable use of Landscape and Scenic Resources,
- the protection, management and enhancement of the provinces Sense of Place, Heritage and Cultural Landscape

### 2.2 The Mossel Bay Spatial Development Framework

The Mossel Bay Spatial Development Framework (MSDF) states that any development or construction proposal that will impact view corridors, ridgelines, cultural landscape assets and existing vistas must be considered with caution and evaluated in terms of the cumulative impact on the broader environment

The MSDF recognizes the following:

- Development on slopes steeper than 1:4 should only be considered in exceptional cases and with caution concerning visual impact, erosion and cut-and-fill scars.
- Gateway precincts must be designed and maintained in a visually aesthetically acceptable way that welcomes visitors to Mossel Bay. This principle applies to the entrances to Mossel Bay town at points where the first urban built-up areas are experienced.
- Scenic landscapes and features must be safeguarded.
- Scenic routes create a sense of place in the region for the public moving on them. The routes and the land use alongside these routes should be managed in a way that will not compromise the views offered but that maintains the sense of place and harmonised experience of the landscapes. Significant scenic routes in the larger Mossel Bay area are as follows:

- The N2 from Hartenbos eastwards
- The northbound road to the Robinson pass
- The road to Herbertsdale
- The rural road to the coastal towns towards the Gouritz river.

### 2.3 The Garden Route Environmental Framework

This document provides baseline data on the Topographical, Visual and 'Sense of Place' aspects in the Garden Route, the sensitivity, constraints and development guidelines for the area assist in informing decision-making.

Management Guidelines are provided for Ecologically Sensitive Geographical Areas. Of particular reference to this report are the guidelines for development in:

- Topographically Sensitive Geographical Areas;
- Conservation and Protected Areas; and
- Visually Sensitive Landscape Geographical Areas.

Risks include:

- Erosion of steep slopes;
- The potential for visual and light pollution;
- Destruction of visual topographical quality;
- Development impact of sensitive topographical features and landscapes;
- Inappropriate large-scale development;
- Sprawling urbanization; and
- Large-scale change of land use developments outside of the urban edge.

Objectives include:

- Maintain the integrity of the Garden Route Landscape;
- Limit development on steep slopes;
- Enhance and protect the topographical landscape backdrop to the Garden Route;
- Manage development on steep slopes, discouraging development;
- Limit development densities
- Retain the 'sense of place' of villages and hamlets;
- Enforce building control and aesthetics;
- Protect the 'sense of place' of the Garden Route;
- Protect and enhance the visual quality of prominent tourism routes, meanders and nodes;
- Protect the visual integrity of the South African National Park asset, as well as provincial nature reserves; and
- Limit and prohibit development on prominent visually sensitive and exposed features.


## 2.4 Heritage and Scenic Resources: Inventory and Policy Framework for the Western Cape

The study provides input on cultural and scenic resources and provides a guide for the identification and conservation of these resources. The report focuses on the broader regional scale rather than the local landscapes or individual site scales and is, therefore, an overview rather than a detailed inventory of cultural and scenic resources.

## 2.5 DEA&DP Guideline for Management of Development on Mountains, Hills & Ridgelines

Key decision-making criteria regarding development on mountains, hills and ridges, relevant to this visual impact assessments, are:

- to avoid inappropriate development (i.e. intrusive and consumptive development) on mountains, hills and ridges taking into account the character of the existing environment;
- to ensure that where development does take place, that its layout and design takes account of sensitive features and environmental constraints, thereby promoting environmentally sensitive development of projects on mountains, hills and ridges where development is authorized;
- to preserve landform features through ensuring that the siting of facilities is related to environmental resilience and visual screening capabilities of the landscape;
- to ensure that the scale, density and nature of the developments are harmonious and in keeping with the sense of place and character of the area.



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Environmental characteristics such as steep slopes (steeper than 1:4) and development on the crest of a mountain, hill or ridge will serve as key indicators of environmental sensitivity.

### **3. PROJECT DESCRIPTION**

#### **3.1 Project location**

The development will be located on Farm 219 located between the Hartenbos River in the west and the Klein Brak River in the east. The N2 national road is located on the northern boundary and the George to Mosselbay railway line is on the southern boundary (Figure 2).



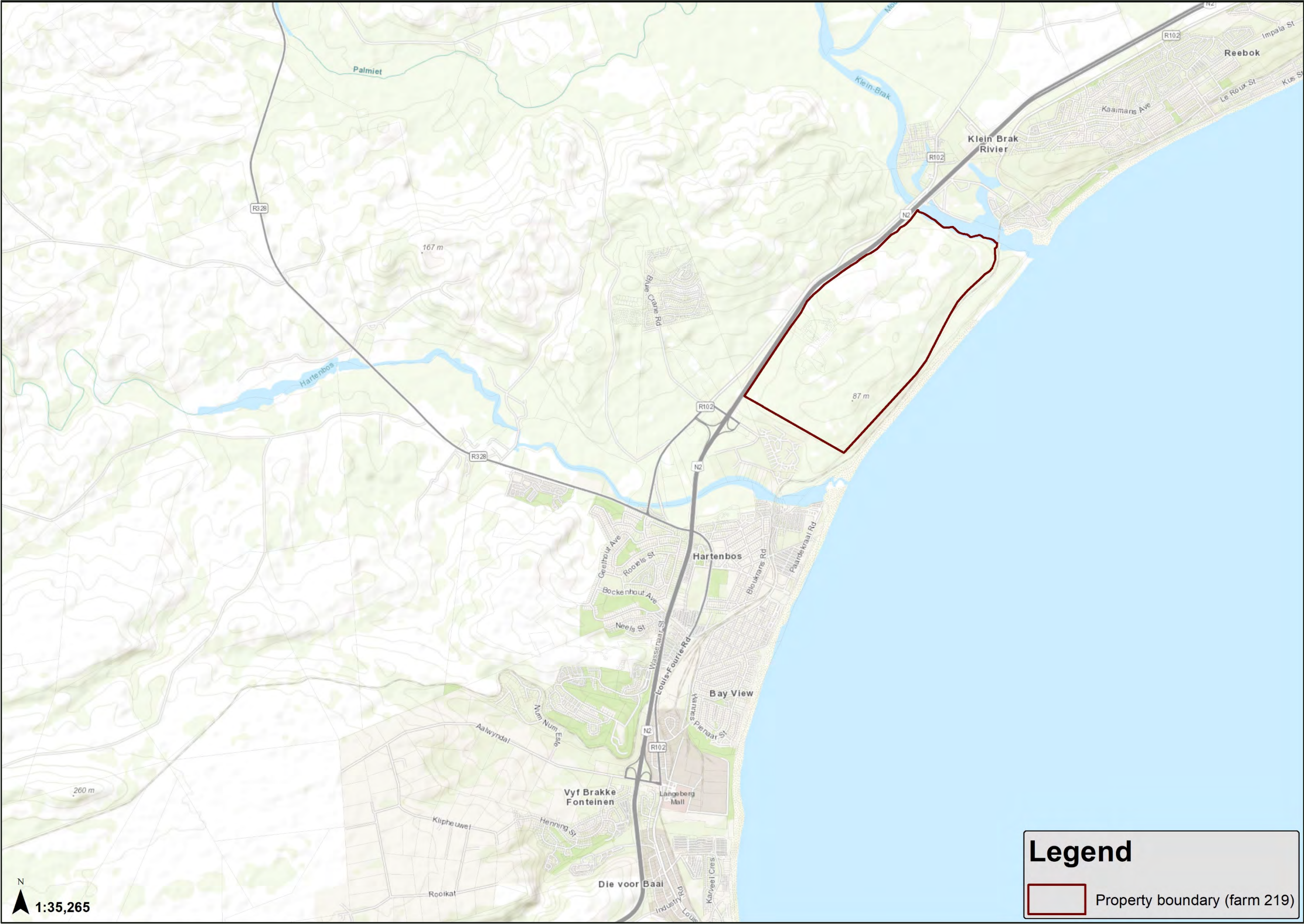


Figure 2: Project location

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### 3.2 Development description

An Environmental Authorisation was granted in 2009 for the development of a residential area consisting of:

- 1265 residential erven (zoned Residential I),
- Five townhouse erven (zoned Residential III that includes 150 social housing units, a multipurpose community centre and a  $\pm 300$  m<sup>2</sup> split zoned Business II site located on Ptn. 1302),
- An open space network and recreation area (zoned Open Space II) and a  $\pm 3\,500$  m<sup>2</sup> split zoned Business II site located on Ptn. 1306,
- A road network and associated infrastructure services
- The remainder of the property will be managed as a nature reserve.

The applicant proposes to amend the current layout HB/C/204/10. The proposed amendments will not increase the total footprint of the development, only re-align internal roads and the density of the houses.

Additionally, as part of the initial authorization, the municipality negotiated with the developer to accommodate 150 social housing units, a community hall and a split zoned business. It is however understood that the residents of Power Town (the beneficiaries of the social housing do not wish to relocate and as such the social housing aspect has become redundant). A new agreement with the Mossel Bay Municipality has been reached and is being implemented in line with the municipal densification policy. This area will now be used for a sports field and school.





Figure 3: Project layout



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## 4. METHODOLOGY

It is in the nature of visual and scenic resources to include abstract qualities and connotations that are by their nature difficult to assess or quantify as they often have cultural or symbolic meaning. It is necessary therefore to include both quantitative criteria (such as viewing distances), and qualitative criteria (such as sense of place), in visual impact assessments.

An implication of this is that impact ratings cannot simply be added together. Instead, the assessment relies on the evaluation of a wide range of considerations, both objective and subjective, including the context of the proposed project within the surrounding area. The phrase “beauty is in the eye of the beholder” is often quoted to emphasize the subjectivity in undertaking a visual impact assessment

The analysis of the interaction between the existing visual environment (landscape character and sense of place) and the planned infrastructure provides the basis for determining visual impacts and mitigation strategies. This is completed by defining the visual effect of the planned infrastructure and visual sensitivity of viewing locations to determine impact.

The evaluation of the existing visual environment consists of the assessment of both the landscape setting and key viewing locations within it. The landscape setting can be defined in terms topography, vegetation, hydrology and land-use features. These elements define the existing visual character of the landscape with which the planned infrastructure interacts.

The use of the basic elements of form, line, colour and textures has become the standard in describing and evaluating landscapes. Modifications in a landscape which repeat the landscape’s basic design elements are said to be in harmony with their surroundings. Modifications which do not harmonize, often look out of place and are said to contrast or stand out in unpleasing ways.

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 be a perception of a visual impact if the landscape becomes subject to visual alteration. 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 practised tend to affect the perception of whether landscape change (through development) would be considered to be an unwelcome intrusion. 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 drawcard 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 power lines and other electricity transmission developments and related infrastructure 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.



## 4.1 Observer locations

Observer locations (views from communities, major roads, conservation areas etc.) are those areas where people (receptors) are likely to obtain a view of the planned infrastructure. These viewing locations have different significance based on numerous factors, collectively evaluated though land use and viewing distance to the planned infrastructure.

The selection of the key viewing locations is based on their location within the defined view-shed where they would have a clear view of the planned infrastructure.

Factors that will be considered in selecting the key viewing locations are:

- **The angle of observation** - The apparent size of a project is directly related to the angle between the viewer's line-of-sight and the slope upon which the planned infrastructure is to take place. As this angle nears 90 degrees (vertical and horizontal), the maximum area is viewable.
- **Numbers of viewers** - Areas seen and used by large numbers of people are potentially more sensitive. Protection of visual values usually becomes more important as the number of viewers increase.
- **Length of time the project is in view** - If the viewer has only a brief glimpse of the planned infrastructure, the contrast may not be of great concern. If, however, the planned infrastructure is subject to view for a long period, as from an overlook, the contrast may be very significant.
- **Distance from the project** - The greater the viewing distances, the lower the visual sensitivity. The visual modification of a development is assumed to be the highest when the observer is very close to it and has a direct line of sight. The visual modification then decreases with distance and is also known as distance decay (Hull & Bishop, 1988).
- **Field of vision** - The visual impact of a development can be quantified to the degree of influence on a person's field of vision both horizontally and vertically. The visual impact of a development will vary according to the proportion in which a development impacts on the central field of vision. Within the central field of vision images are sharp, depth perception occurs and colour discrimination is possible. Developments, which take up less than 5% of the central field of vision, are usually insignificant in most landscapes (Human Dimension and Design, 1979).
- **Visibility** - Viewed by the human eye 1.8 m from the ground across a "flat" surface such as the sea, the horizon will be of the order of 6 km distant, due to the curvature of the earth. Viewed at an elevation of 60 m, the horizon will be of the order of 32 km distant and from the top of a 1000 m mountain, the horizon will be at a distance of approximately 113 km. A tall structure standing above the horizon would, of course, increase these distances significantly; for example, for an observer at 1.8 m who is viewing a man-made structure 50 m tall, the effective distance to the horizon is 34 km and for a 100 m structure the distance is 46 km (Miller & Morrice, no date). In addition, mist, haze or other atmospheric conditions may significantly affect visibility (Hill et al, 2001).

## 4.2 Visual sensitivity

Visual sensitivity is a measure of how critically a change to the existing landscape is viewed by people from different land-use areas in the vicinity of a development.

The degree of visual sensitivity of an area is closely related to the aesthetic quality of the area, as well as to the value placed in the aesthetic quality of the landscape but is also related to the area's socio-economic profile. In this regard, residential, tourist and/or recreation areas generally have a higher visual sensitivity than other land use areas (e.g. industrial, agricultural or transport corridors), because they use the scenic amenity values of the surrounding landscape and may be used as part of a leisure experience and often over extended viewing periods.

It is important to note that the presence of natural / perceived natural and rural elements or areas within the landscape as viewed from the surrounds of the project area can engender perceptions of aesthetic quality or

value to the landscape. Many studies of landscape conservation have highlighted the value placed by people in rural or natural landscapes. A rural landscape can be defined as an area where an interaction between humans and nature over time has led to the development of a landscape that has its characteristics, and which is a middle ground between an urban landscape and wilderness, consisting of human activities that are related to the natural environment, such as agriculture and pastoral activities (Mazehan et al, 2013). A natural landscape, as defined in this report is close in appearance to how the landscape would appear without human alteration – i.e. mimicking or closely resembling that of a wilderness.

Placing value in a landscape is a psychological and cultural practice; values and meanings are not intrinsic to the landscape, but rather they are phenomena created by humans through their cultural practices (Pun, 2004). It is thus important to note that perceptions of a landscape may not be universally shared, and different individuals or groups of people may perceive or treat the same landscape differently, in turn ascribing different values and meanings to it (Pun, 2004). Values and meanings ascribed by local people may not be evident to an outsider.

There are different types of values that can be placed on a landscape; i.e. economic values (e.g. the relevance of the landscape for business enterprises, or the market possibility of products from the landscape), amenity values (values related to the non-material benefits associated with it) and security values (Pun, 2004). Amenity values can be subdivided into different sub-categories; “intrinsic” ecological value, scientific and educational value, aesthetical and recreational value, and orientational and identity value.

Landscapes and the viewing of landscapes have also been shown to have positive psychological and health benefits; Velarde et al (2007), have shown through an examination of various environmental psychology studies that visual exposure to natural landscapes (e.g. by means of viewing natural landscapes during a walk, or viewing from a window) generally has a beneficial impact on human health (e.g. reduced stress, facilitating recovery from illness, and behavioural changes that improve mood and general well-being).

Landscape as a source of beauty is prevalent within the arts and is a strong drawcard for recreational activities. In addition, the landscape is an element in the ability of people to orient themselves and is strongly related to people’s cultural identity and sense of place. It is in this context that value is placed in natural or rural landscapes, and it follows that such value would be placed on views in an area such as the study area which is largely natural, and which has high aesthetic value by virtue of its scenic nature.

The above values can be interlinked, but can also be conflicting, e.g. amenity values associated with a landscape held by a certain group of people as described above may conflict with economic values associated with the market or development possibility of the landscape that is held by others. It is in this context that visual impact associated with a potential development often arises as an issue in environmental impact assessments.

The latter three sub-categories of amenity value described above – aesthetic, identity and psychological health value are typically involved in the perception of visual impact and constitute the elements of the ‘visual sensitivity’ associated with that landscape, as development within a landscape can change the landscape to the degree to which the amenity value associated with a landscape would be considered to be degraded or no longer present.

Visual sensitivity may range from high to low, depending on the following additional factors:

- **The visual absorption capacity** - The potential of the landscape to conceal the proposed project will reduce or increase visual sensitivity.
- **Viewing distance** – The greater the viewing distance, the lower the visual sensitivity. The visual modification of a development is assumed to be the highest when the observer is very close to it and has a direct line of sight. The visual modification decreases with distance and is also known as distance decay (Hull & Bishop 1988).

- **Length of time** the project is in view - If the viewer has only a brief glimpse of the planned infrastructure, the contrast may not be of great concern and the visual sensitivity low. If, however, the planned infrastructure is subject to view for a long period, as from an overlook, the contrast may be very significant.
- **General orientation** - General orientation of residences to landscape areas affected by a project. Residential, tourist and/or recreation areas with a strong visual orientation towards the planned infrastructure (i.e. those with areas such as living rooms and/or verandas orientated towards it), will have a higher visual sensitivity than those not orientated towards the planned infrastructure.
- **Relative planned infrastructure size** - The contrast created by the project is directly related to its size and scale as compared to the surroundings in which it is placed.
- **Type of users** - Visual sensitivity will vary with the type of users. Recreational sightseers may be highly sensitive to any changes in visual quality, whereas workers who pass through the area regularly may not be as sensitive to change.
- **Numbers of viewers** - Areas seen and used by large numbers of people are potentially more sensitive. Protection of visual values usually becomes more important as the number of viewers increases.
- **Adjacent land uses** - The inter-relationship with land uses in adjacent lands can affect the visual sensitivity of an area. For example, an area within the view-shed of a residential area may be very sensitive, whereas an area surrounded by commercially developed lands may not be visually sensitive.
- **Special areas** - Management objectives for special areas such as natural areas, wilderness areas, conservation areas, scenic areas, scenic roads or trails frequently require special consideration for the protection of the visual values. This does not necessarily mean that these areas are scenic, but rather that one of the management objectives may be to preserve the natural landscape setting. The management objectives for these areas may be used as a basis for assigning sensitivity levels.

Landscapes are subdivided into three (3) distanced zones based on relative visibility from travel routes or observation points (receptors). The three zones are:

- **Foreground-Middle ground Zone** - This is the area that can be seen from each travel route for a distance of 0 to 5 kilometres where management activities might be viewed in detail. The outer boundary of this distance zone is defined as the point where the texture and form of individual plants are no longer apparent in the landscape. In some areas, atmospheric conditions can reduce visibility and shorten the distance normally covered by each zone.
- **Background Zone** - This is the remaining area which can be seen from each travel route to approximately 24 kilometres but does not include areas in the background which are so far distant that the only thing discernible is the form or outline. To be included within this distance zone, vegetation should be visible at least as patterns of light and dark.
- **Seldom-Seen Zone** - These are areas that are not visible within the foreground-middle ground and background zones and areas beyond the background zones.

Land-use areas are generally characterised in terms of low, moderate or high visual sensitivity, as follows:

- **Low visual sensitivity** - industrial areas, local roads, mining and degraded areas.
- **Moderate visual sensitivity** - tourist roads, major roads, sporting or recreational areas and places of work.
- **High visual sensitivity** - rural residences, recreation areas, conservation areas, scenic routes or trails.

### 4.3 Visual modification

Visual modification is a measure of the level of visual contrast and integration of the planned infrastructure with the existing landscape.

An existing landscape has certain visual characteristics expressed through the visual elements of form, shape, line colour and texture. A development that has different visual characteristics than the existing landscape will create contrast with the existing landscape. If similar infrastructure already forms part of the existing landscape,

the visual effects of the planned infrastructure will borrow visual character from these operations, reducing visual modification.

The degree to which the visual characteristics of the planned infrastructure contrast with the existing landscape will determine the level of visual modification. For example, a newly created mine will have a high visual modification due to strong contrast. An extension of operations in an existing mine will have a lesser visual modification. A successfully rehabilitated mine area will also have a lower visual modification due to limited contrast with the existing landscape.

Similarly, a project is said to be integrated with the existing landscape based on issues of scale, position in the landscape and contrast. High visual integration is achieved if a development is dominated by the existing landscape, and is of small scale and/or limited contrast.

The level of visual modification generally decreases with distance and is categorised as follows:

- **Negligible (or very low) level of visual modification** – where the development is distant and/or relates to a small proportion of the overall view-shed.
- **Low level of visual modification** - where there are minimal visual contrast and a high level of integration of form, line, shape, pattern, colour or texture values between the development and the landscape. In this situation, the development may be noticeable but does not markedly contrast with the landscape.
- **Moderate level of visual modification** - where a component of the development is visible and contrasts with the landscape, while at the same time achieving a level of integration. This occurs where surrounding topography, vegetation or existing modified landscape provide some measure of visual integration or screening.
- **High level of visual modification** - where the major components of the development contrast strongly with the existing landscape and demand attention.

The following factors must be considered when applying visual modification categories:

- **Length of time the project is in view** - If the viewer has only a brief glimpse of the project, the contrast may not be of great concern. If, however, the project is subject to view for a long period, from a viewing location, the contrast may be very significant.
- **Relative size or scale** - The contrast created by the project is directly related to its size and scale as compared to the surroundings in which it is placed.
- **Recovery time** - The amount of time required for successful re-vegetation should be considered. Recovery usually takes several years and goes through several phases (e.g. bare ground to grasses, to shrubs, to trees, etc.). It may be necessary to conduct contrast ratings for each of the phases that extend over long time periods. Those conducting contrast ratings should verify the probability and timing of vegetative recovery.
- **Atmospheric conditions** - The visibility of planned infrastructure due to atmospheric conditions, such as air pollution or natural haze, should be considered
- **Motion** - Movement such as waterfalls, vehicles or plumes draw attention to a project.
- **Form** - Contrast in form results from changes in the shape and mass of landforms or structures. The degree of change depends on how dissimilar the introduced forms are to those continuing to exist in the landscape.
- **Line** - Contrasts in line result from changes in edge types and interruption or the introduction of edges, bands, and silhouette lines. New lines may differ in their sub-elements (boldness, complexity, and orientation) from existing lines.
- **Colour** - Changes in value and hue tend to create the greatest contrast. Other factors such as chroma, reflectivity and colour temperature, also increase the contrast.

- **Texture** - Noticeable contrast in texture usually stems from differences in the grain, density and internal contrast. Other factors such as irregularity and directional patterns of texture should also be considered.

## 5. VISUAL ASSESSMENT OF THE SITE AND PROPOSED DEVELOPMENT

The DEA&DP Guideline for involving visual & aesthetic specialists in EIA processes Document provides a number of criteria that relate specifically to Visual Impact Assessments namely:

- Visibility of the project;
- Visual exposure;
- Visual sensitivity of the area;
- Visual sensitivity of receptors;
- Visual Absorption Capacity; and
- Visual Intrusion.

It is recommended that the proposed project should be assessed against these criteria before attempting to assess the visual impact of the proposed development.

### 5.1 Description of the affected area and the scenic resources

The development is situated in the Garden Route, in the southeastern extent of the Western Cape (Figure 2). The area is a scenic, coastal area with a rich, visual diversity. This diverse and beautiful coastal area is a landscape formed over millions of years and numerous sea-level changes. The Outeniqua mountain, which consists of hard and folded Table Mountain Quartzite, forms a majestic backdrop to a coastal platform, in the north (Figure 4).



**Figure 4:** A view of the undulating coastal platform and Outeniqua mountains in the Garden Route

**From: The Garden Route Environmental Framework (2010)**

*“The landscape of the Garden Route comprises an intricate mosaic of landforms, which further supports its diverse ecological features. These features extend from coastal features, through to the lake system, framed by the backdrop of the high Outeniqua mountains. The area is similarly dissected by numerous rivers draining the highlands to the coast. The coastal landscape is characterised by sensitive foredune systems which are prone to erosion, and which perform critical ecological functions, and which similarly are sought after for residential property development. The area is characterised by cover sands on steep slopes surrounding the lakes and estuaries, which are unstable and unsuitable for development activity.*”



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and

*The Garden Route has been named as such due to the visual and aesthetic quality attached to the region. Similarly, the region is considered as one of the most scenic in the country, attracting significant numbers of domestic and international tourist throughout the year. This asset is, unfortunately, one of the regions limiting factors. Due to the perceived high - quality of life associated with the region underpinned by scenic topography, quaint villages and hamlets, large tracts of natural open space systems supported by an extensive national park system (Garden Route National Park); the Garden Route has become the ideal location of retired individuals from the larger cities, as well as a growing international interest. This insatiable demand for development land for residential and tourism use is limited by the biophysical, physical and aesthetic constraints of the area. It is indeed the case of the "exact reasons for the attraction could become its downfall".*

Although the development is wedged in between existing urban areas (Kleinbrak, Hartenbos) it still takes full advantage of the Garden Routes scenic qualities as mentioned above (Figure 3). The ocean is visible towards the south and the Outeniqua mountain range in the far distance towards the north. Sections of the Garden Route coastline are also visible towards the northeast from the elevated topography on the development site.

## 5.2 Surrounding land uses

The development is surrounded by existing developments and neighbourhoods. The Monte Christo Estate is located to the north on the other side of the N2 and the Hartenbos Estate is located on the western boundary. Hartenbos is located towards the west on the banks of the Hartenbos River and Kleinbrak next to the Kleinbrak River on the eastern boundary. Agricultural and some natural areas are located towards the north. (Figure 5).





Figure 5: Adjacent land uses



### 5.3 Topography

The topography of the proposed development site can be described as a low, flat-topped ridge with gentle to very steep sloping sides and featuring indents where the landscape has been eroded into small valleys by drainages. Slopes on the southern edge are steep and end on coastal cliffs, while those beyond the northern half are more gradual. The average height above sea level varies between 24 – 96 meters (Figure 7).

A gentle east-west ridge forms a natural watershed which creates two main drainage areas to the north and the south. The area towards the southern boundary of the site drains via riparian zones and natural drainage channels. The northern part does not have any prominent natural drainage courses.

### 5.4 Local vegetation

The proposed development site is located in Hartenbos Dune Thicket vegetation (Figures 6 & 8). In many areas, the vegetation is transformed/disturbed and invaded by invasive alien trees such as Rooikrans.



**Figure 6:** Local vegetation

### 5.5 Protected landscapes

The proposed development site lies within the Gouritz Cluster Biosphere Reserve. The project area contains areas of Critical Biodiversity Areas 1, Critical Biodiversity Areas 2, Ecological Support Areas 1 and Ecological Support Areas 2. The development footprint is largely located in the agricultural area (Figures 8 & 9).



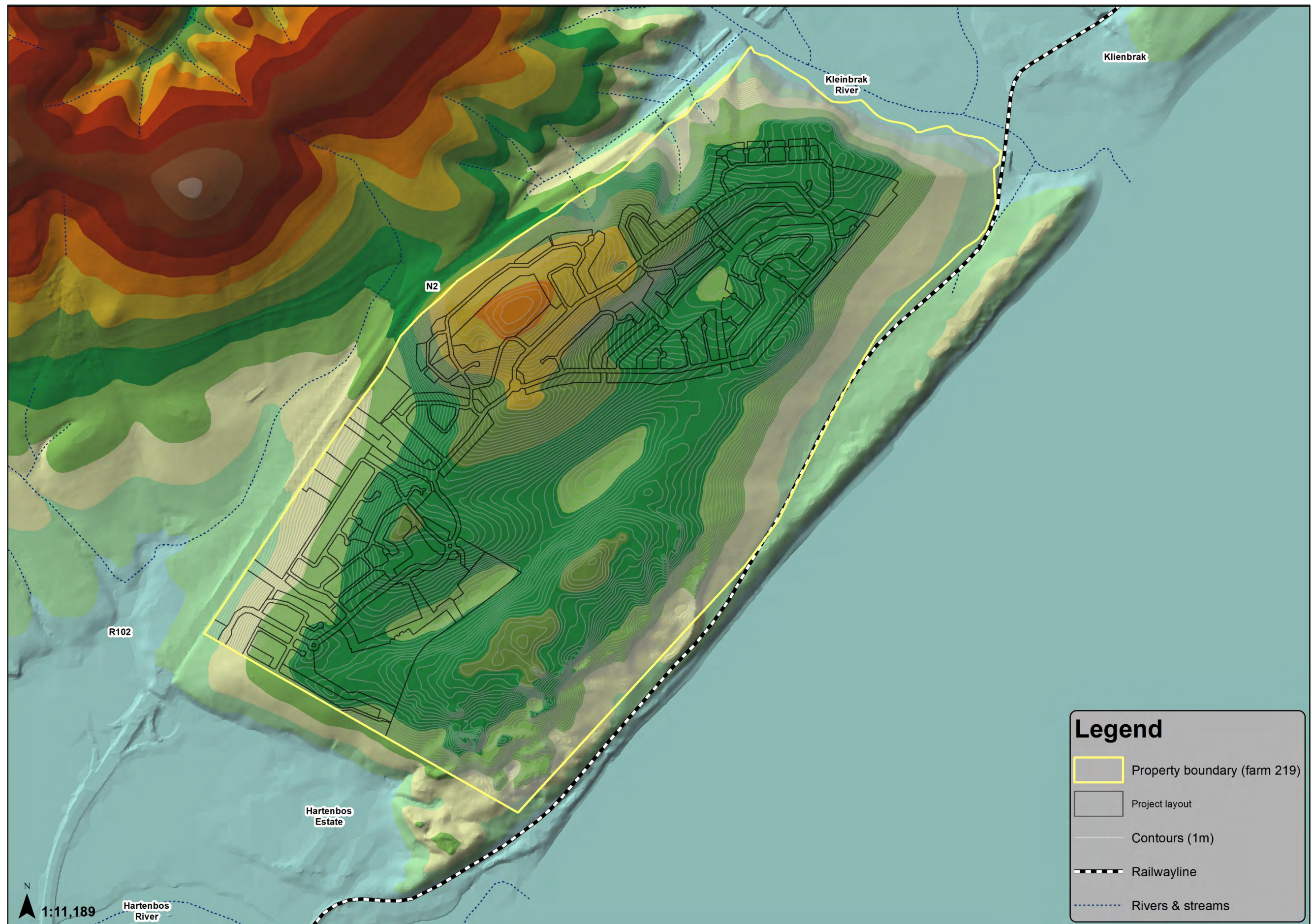


Figure 7: Project site topography



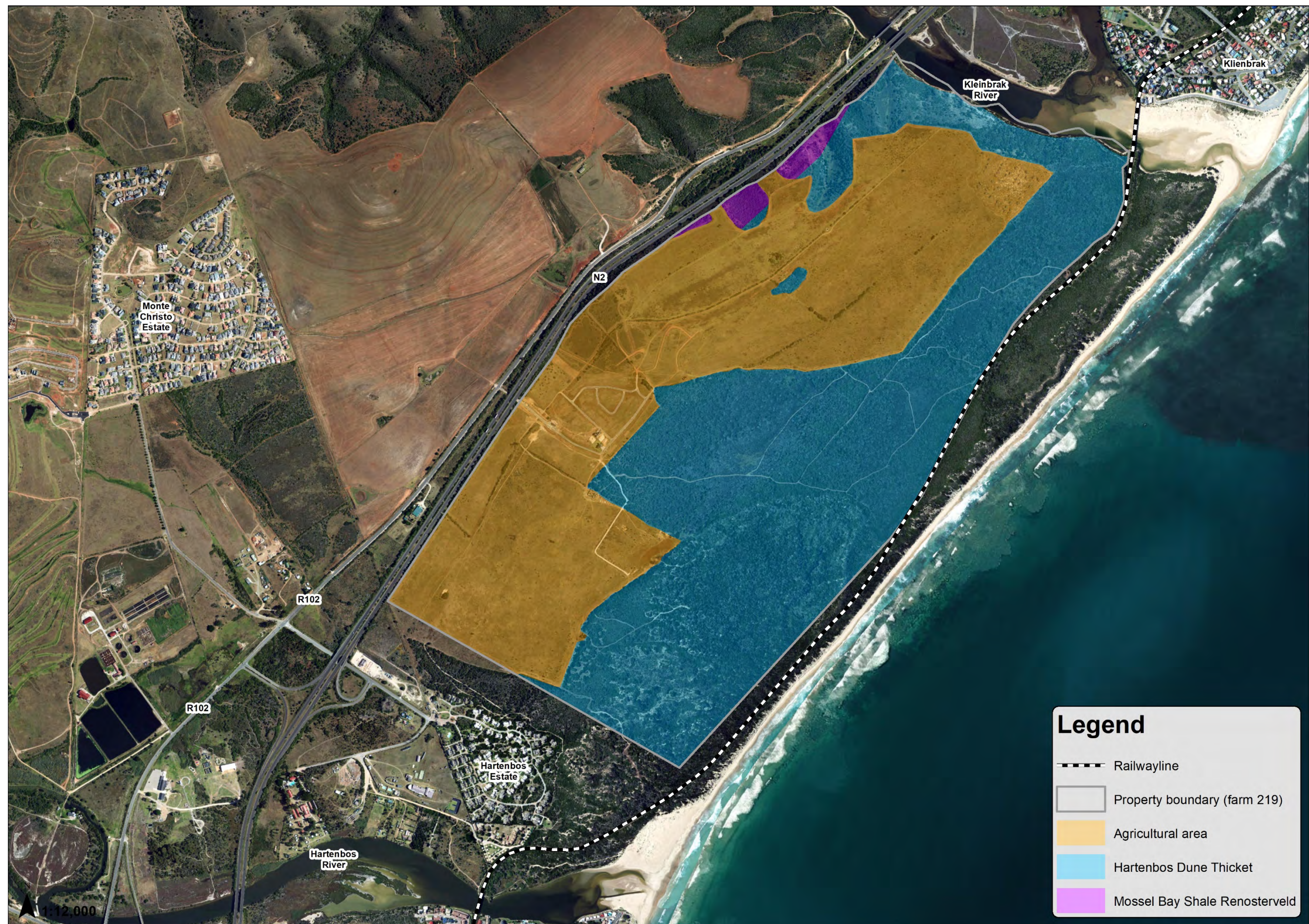


Figure 8: Vegetation map





Figure 9: Protected landscapes



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## 6. VISIBILITY OF THE PROPOSED DEVELOPMENT

### 6.1 Zone of visual influence

The geographical area from which the proposed development will theoretically be visible, or view catchment (probable viewshed), is dictated by topography. Theoretically, the development site could be seen from the all surrounding areas. However, distance, developments, houses and vegetation will reduce the actual view catchment that the proposed development site will have, to a much smaller area (zone of visual influence).

Based on the information gathered from the the various observer locations the zone of visual influence was determined for the development (Figure 10-28). It spans an area of approximately 1 km south, 2.5 km west, 2.7 km north and 0.5 km to the east. According to the specific criteria for visual impact assessments, the visibility of the site is local, being visible from an area less than 5km away.

### 6.2 Receptors

The level of visual impact considered acceptable is dependent on the type of receptors. The following receptor sensitivity ratings were considered:

- High sensitivity – e.g. residential areas, nature reserves and scenic routes or trails
- Moderate sensitivity – e.g. sporting or recreational areas, or places of work
- Low sensitivity – e.g. industrial, or degraded areas

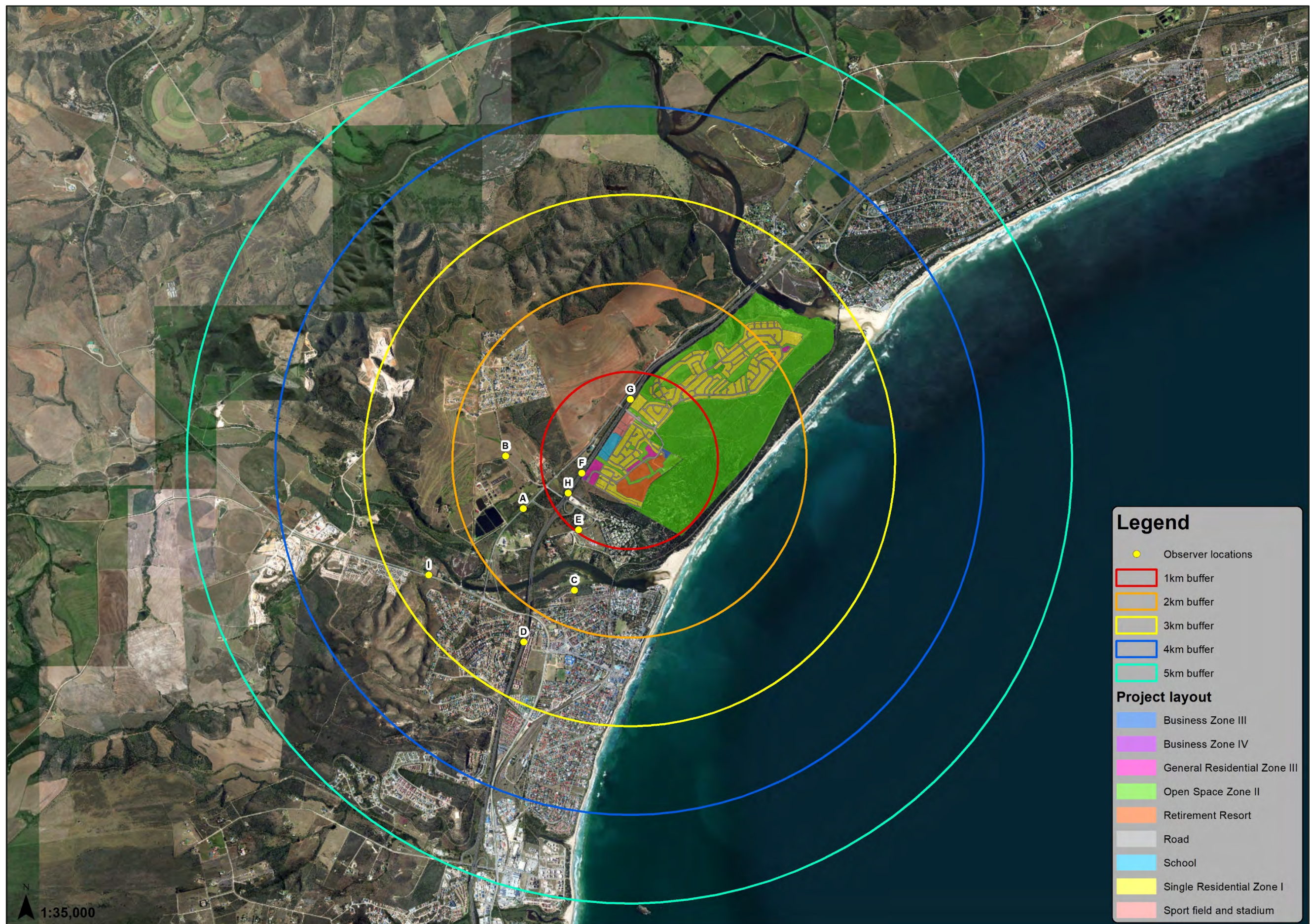
Highly sensitive receptors of the proposed development site include the residential areas located next to the project location (Hartenbos & Monte Christo Estates & Hartenbos) (Figure 5).





Figure 10: Observer locations





**Figure 11:** Distance zones (buffers)



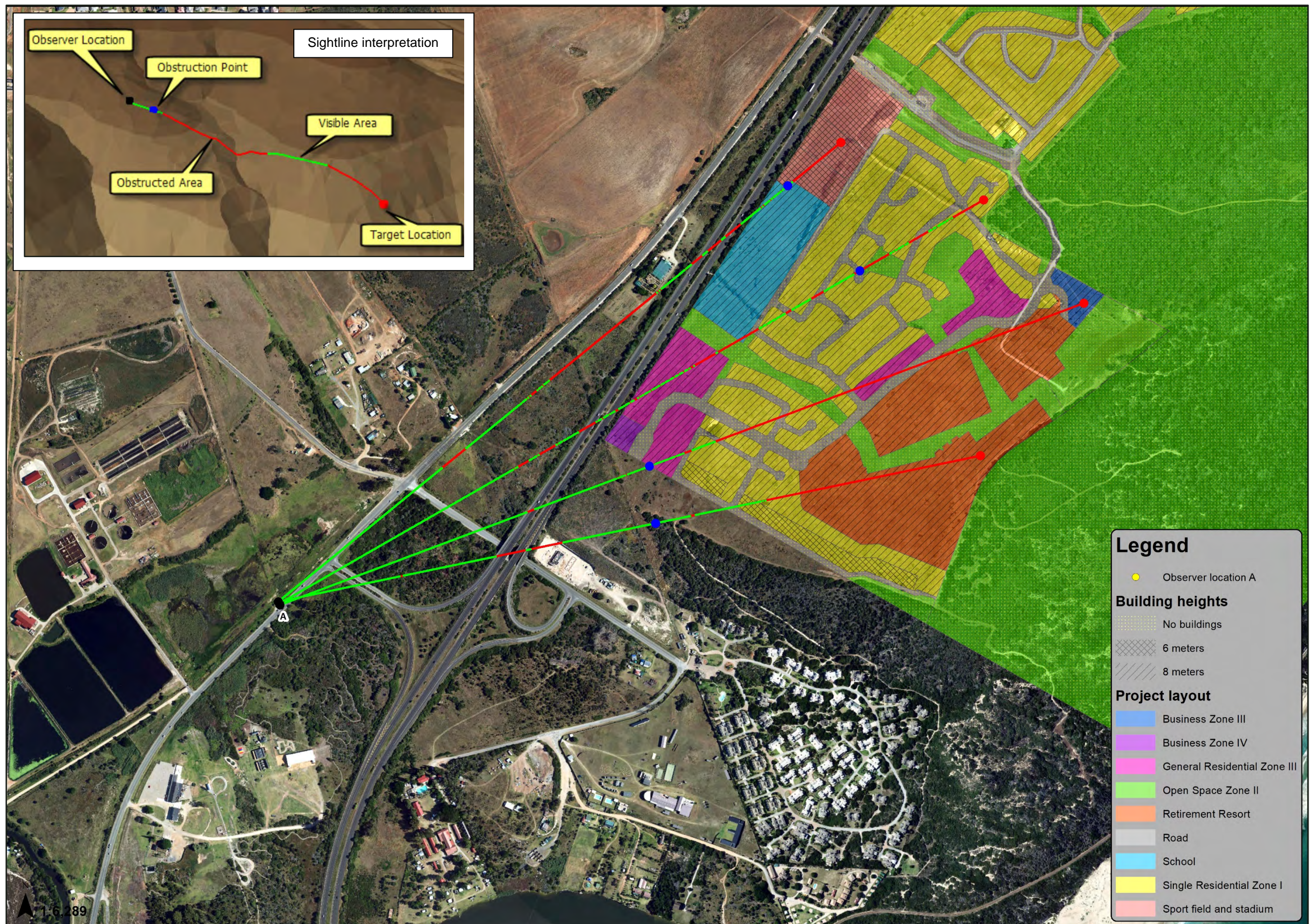


Figure 12: Observer location A sightlines



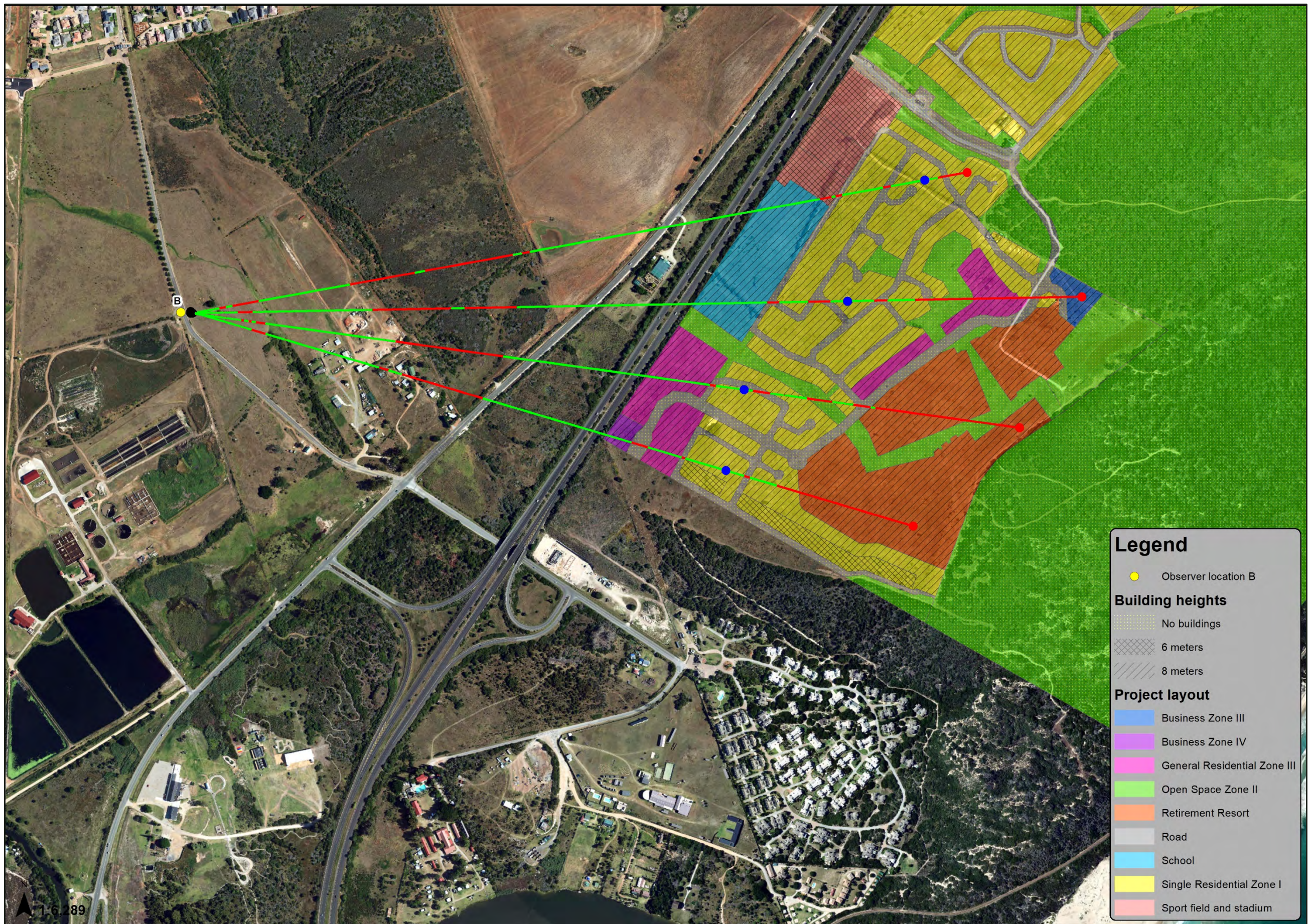


Figure 13: Observer location B sightlines



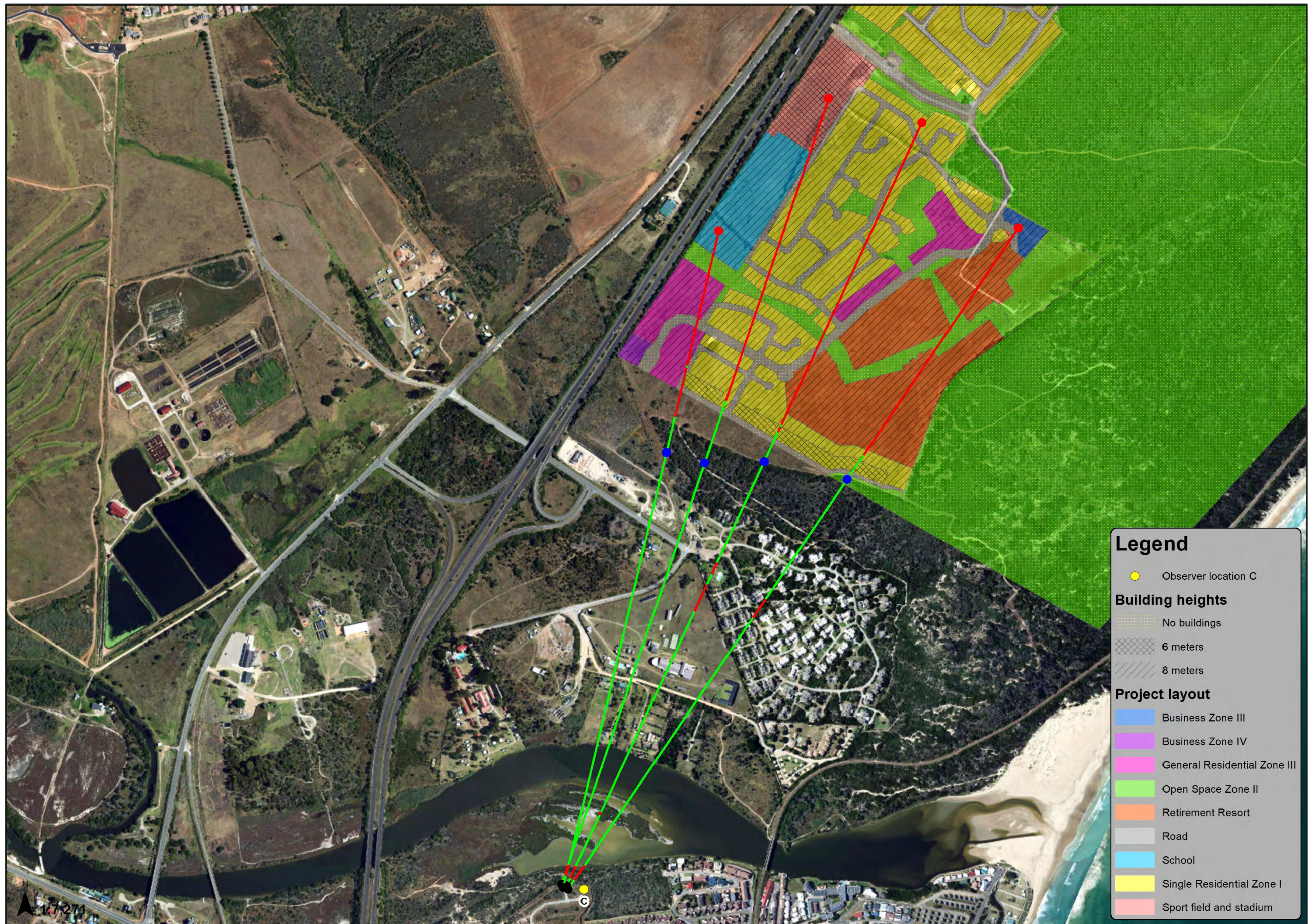


Figure 14: Observer location C sightlines





Figure 15: Observer location D sightlines



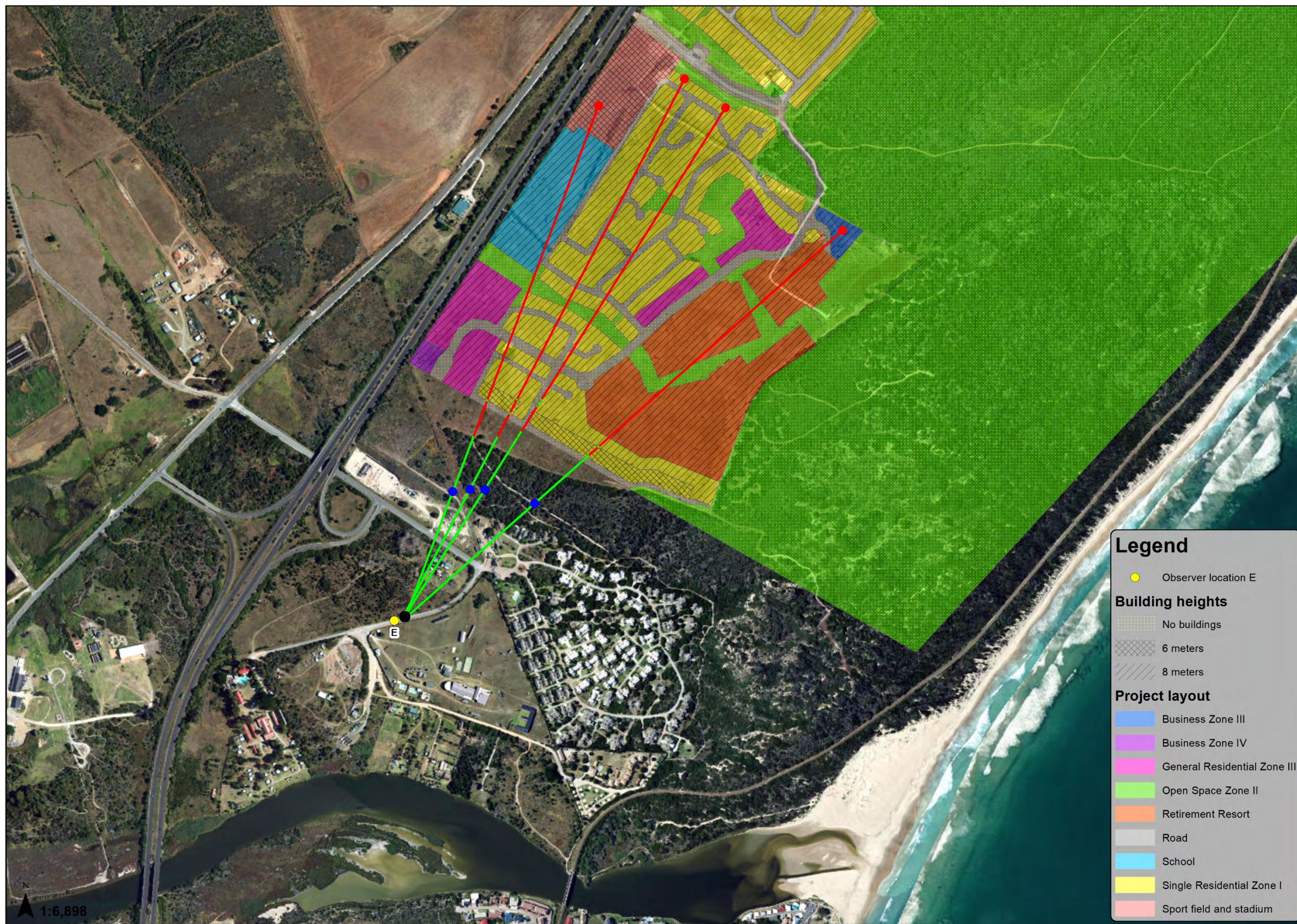


Figure 16: Observer location E sightlines



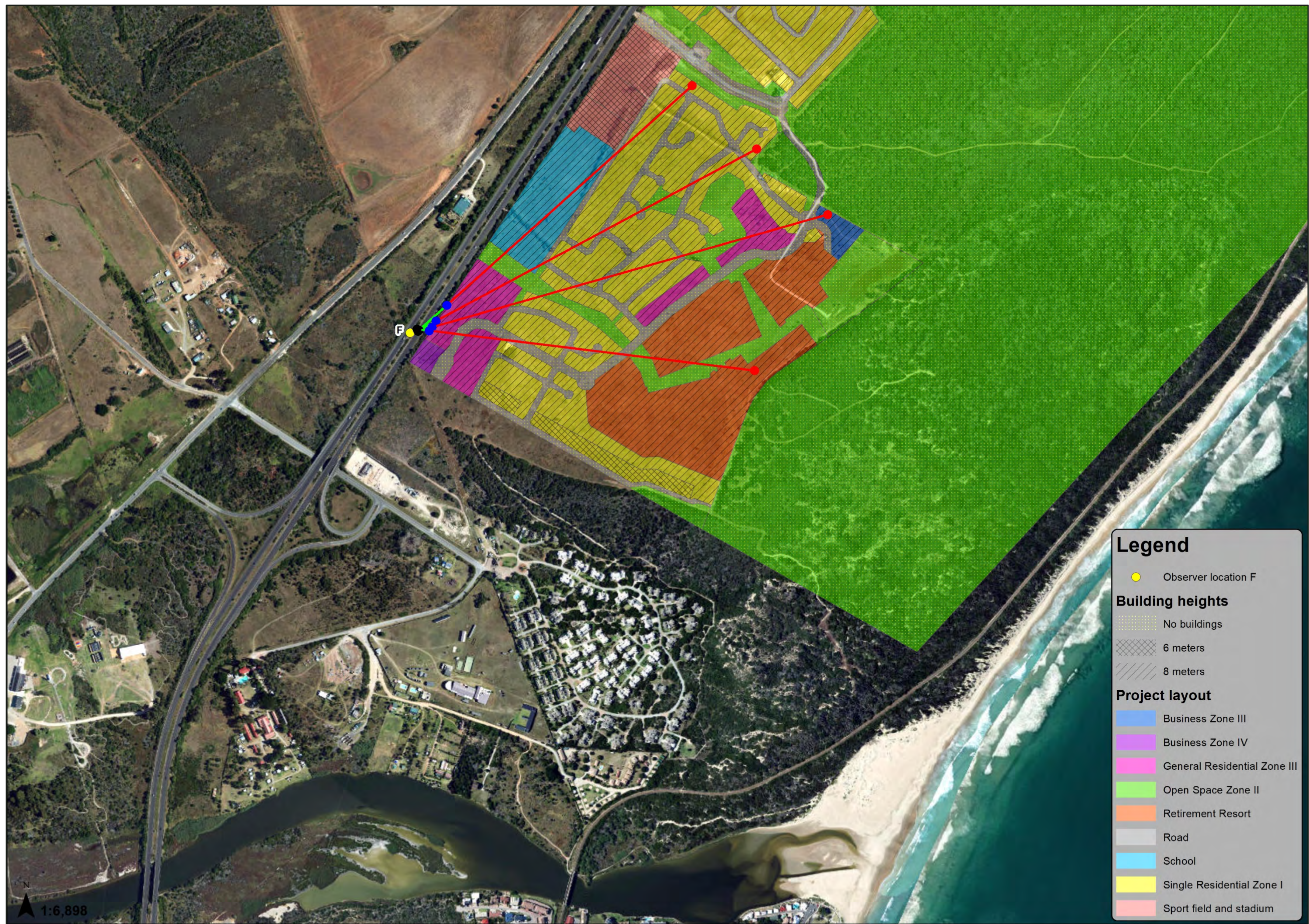


Figure 17: Observer location F sightlines





Figure 18: Observer location G sightlines



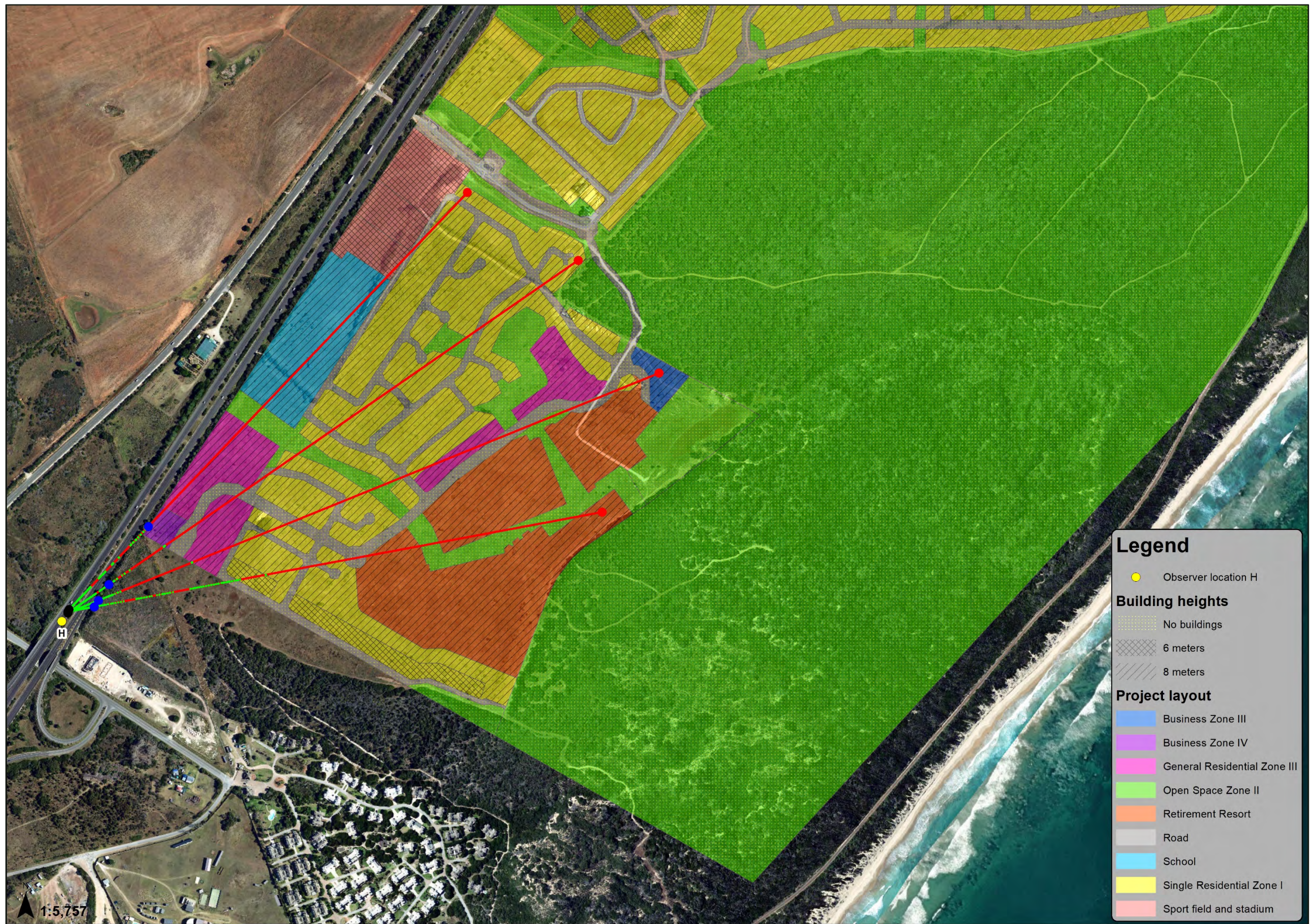


Figure 19: Observer location H sightlines



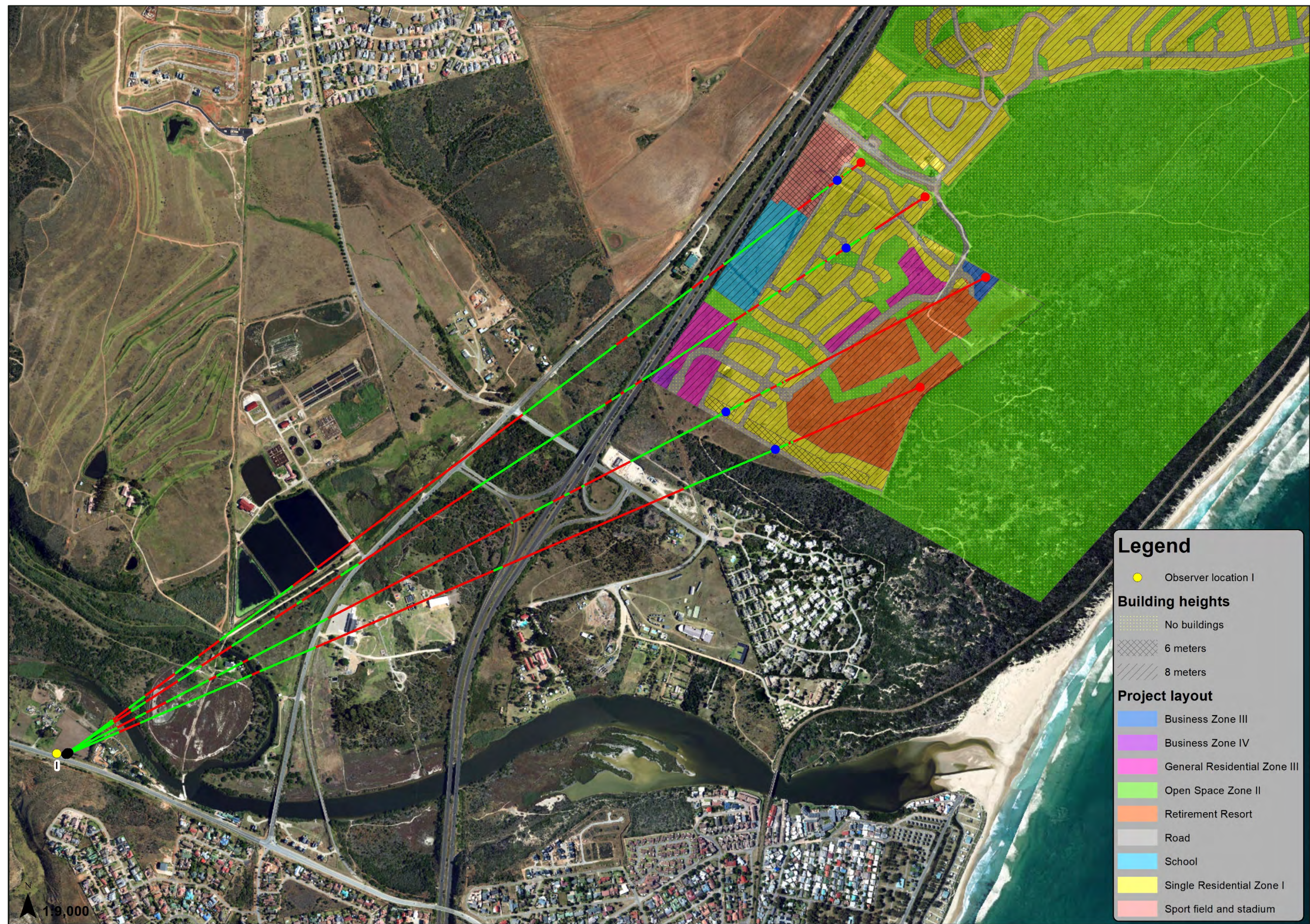


Figure 20: Observer location I sightlines





Figure 21: Observer location A

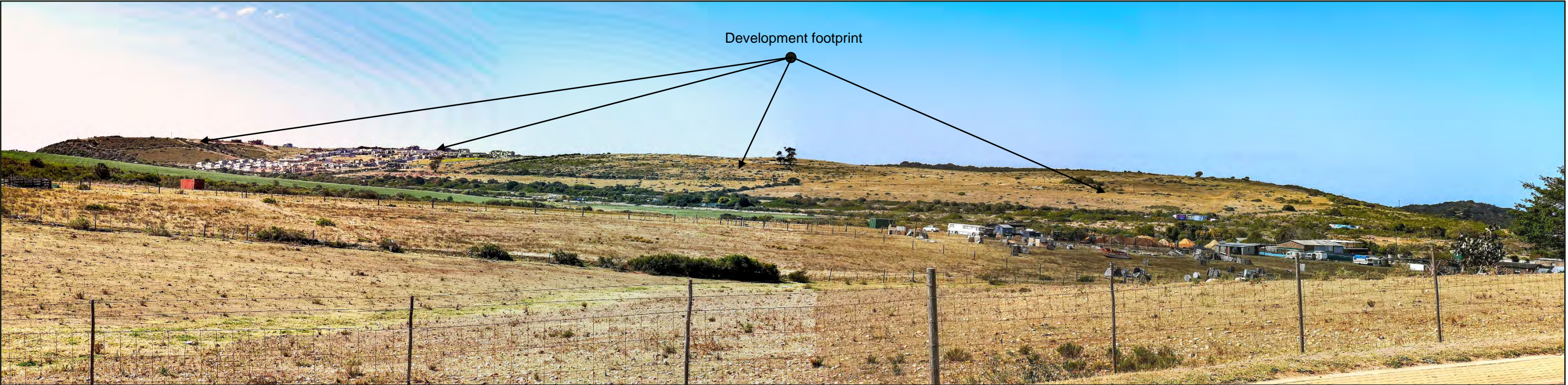


Figure 22: Observer location B





Figure 23: Observer location C



Figure 24: Observer location D





Figure 25: Observer location E



Figure 26: Observer location F



Figure 27: Observer location G





Figure 28: Observer location H



Figure 29: Observer location H





## 6.3 Visual exposure (sightline analysis)

The visual impact of a development diminishes at an exponential rate as the distance between the observer and the object increases. Relative humidity and fog in the area directly influence the effect. Increased humidity also causes the air to appear greyer which diminishes detail. Thus, the impact at 1 km would be 25% of the impact as viewed from 500 m. At 2km, it would be 10% of the impact at 500 m. The inverse relationship between distance and visual impact is well recognised in visual analysis literature (Hull and Bishop, 1998) and was used as important criteria for this study.

Thus, visual exposure is an expression of how close receptors are expected to get to the proposed development regularly. For this assessment, close-range views (equating to a high level of visual exposure) are views over a distance of 500 m or less, medium-range views (equating to a moderate/medium level of visual exposure) are views of 500 m to 2 km, and long-range views are over distances greater than 2 km (low levels of visual exposure).

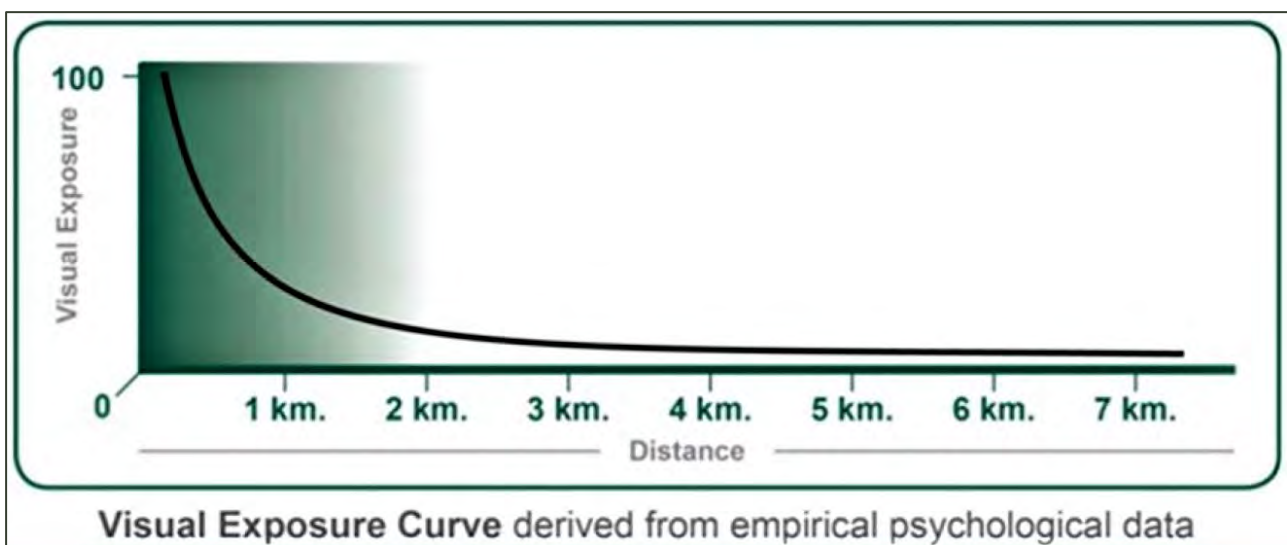


Figure 30: Visual exposure graph

Within the Zone of Visual Influence view corridors, viewpoints and receptors will experience “Visual Exposure” to the proposed development. The following visual exposure classes were considered during the assessment:

- High exposure – dominant or clearly noticeable
- Moderate exposure – recognisable to the viewer
- Low exposure – not particularly noticeable to the viewer

### 6.3.1 View corridors

#### 6.3.1.1 Observer location A view corridor

The view corridor is located just beyond the 1km distance zone and will therefore have high exposure to the development. The sightline analysis shows that the Retirement Village, Business Zone III and the General Residential Zone III located next to the Retirement Village will not be visible from observer location A. Some portions of the Single Residential Zone 1 will also not be visible (Figures 11, 12 & 21).

#### 6.3.1.2 Observer location B view corridor

The view corridor is located just beyond the 1km distance zone and will therefore have high exposure to the development. The sightline analysis shows that the Retirement Village, Business Zone III and the General



Residential Zone III located next to the Retirement Village will not be visible from the observer location B. (Figures 11, 13 & 22).

#### 6.3.1.3 Observer location C view corridor

The view corridor is located just beyond the 1km distance zone and will therefore have high exposure to the development. The sightline analysis shows that the Retirement Village, Business Zone III and a large portion of the surrounding development footprint will not be visible from observer location C (Figures 11, 14 & 23).

#### 6.3.1.4 Observer location D view corridor

The view corridor is located just beyond the 2km distance zone and will therefore have moderate exposure to development. The sightline analysis shows that a small section of the Retirement Village will be visible but due to the distance from the development it will be difficult to distinguish. The remaining Retirement Village and Business Zone III and the General Residential Zone III located next to the Retirement Village will not be visible from the observer location D (Figures 11, 15 & 24).

#### 6.3.1.5 Observer location E view corridor

The view corridor is located within the 1km distance zone and will therefore have high exposure to the development. The sightline analysis shows that most of the development will not be visible from observer location E (Figures 11, 16 & 25).

#### 6.3.1.6 Observer location F view corridor

The view corridor is located within the 1km distance zone and will therefore have high exposure to the development. The sightline analysis shows that most of the development will not be visible from observer location F (Figures 11, 17 & 26).

#### 6.3.1.7 Observer location G view corridor

The view corridor is located within the 1km distance zone and will therefore have high exposure to the development. The sightline analysis shows that the Retirement Village, Business Zone III and a large portion of the surrounding development footprint will not be visible from observer location G (Figures 11, 18 & 27).

#### 6.3.1.8 Observer location H view corridor

The view corridor is located within the 1km distance zone and will therefore have high exposure to the development. The sightline analysis shows that the Retirement Village, Business Zone III and a large portion of the surrounding development footprint will not be visible from observer location C (Figures 11, 19 & 28).

#### 6.3.1.9 Observer location I view corridor

The view corridor is located beyond the 2km distance zone and will therefore have moderate exposure to the development. The sightline analysis shows that the Retirement Village, Business Zone III and the General Residential Zone III located next to the Retirement Village will not be visible from observer location A (Figures 11, 20 & 29).

## 6.4 Visual sensitivity

The inherent visibility of a project site's landscape is usually determined by a combination of topography, landform, vegetation cover, settlement pattern and special features. This translates into visual sensitivity. The following visual sensitivity classes were considered during the assessment:

- High visual sensitivity – highly visible and potentially sensitive areas in the landscape,
- Moderate visual sensitivity – moderately visible areas in the landscape,



- Low visual sensitivity – minimally visible areas in the landscape

Slope and aspect are very important in the context of views. Topography expressed in the form of slope and aspect can perform an important role in limiting views or ‘focusing’ views in a certain direction. Many of the viewers surrounding the hilltop on which the development is located are located on lower elevations and therefore would experience a limited visual envelope or viewshed, as the rising topography around them would prevent wider views of the surrounding terrain beyond the immediate low-lying areas.

Although the development is located on a prominent hilltop a considerable percentage of the development is hidden from view because it is located in low-lying areas on the hilltop. The portions of development located on the ridgeline surrounding the low-lying areas will be visible (Figure 7). The development, therefore, has a moderate visual sensitivity.

## 6.5 Visual absorption capacity

Visual Absorption Capacity (VAC) is the capacity of the landscape to conceal the proposed development. The VAC of a landscape depends on its topography, the type of vegetation and surrounding infrastructure (buildings, roads etc.) that occurs in the landscape. The size and type of development also play a role. The following visual absorption classes were considered during the assessment:

- High VAC – effective screening is provided by topography, vegetation and existing infrastructure
- Moderate VAC – partial screening is provided by topography, vegetation and existing infrastructure
- Low VAC – little screening is provided by topography, vegetation and existing infrastructure

Although the development is located on a hilltop low-lying area on the hilltop conceals a large portion of the development (Figure 7). The visual absorption capacity is therefore moderate.

## 6.6 Visual intrusion

Visual intrusion is defined as the level of compatibility or congruence of the project with the particular qualities of the area, or its sense of place. This is related to the idea of context and maintaining the integrity of the landscape or townscape. The following visual intrusion classes were considered during the assessment:

- High visual intrusion – the proposed development results in a noticeable change or is discordant with the surroundings
- Moderate visual intrusion – the proposed development partially fits into the surroundings but is clearly noticeable
- Low visual intrusion – the proposed development creates minimal change or blends in well with the surroundings

The proposed development is an extension of the surrounding residential and other developments (Hartenbos & Monte Christo Estates, Hartenbos and Sonskynvallei) but is located on a hilltop (Figures 5 & 7). The development therefore has a moderate visual intrusion.

# 7. POTENTIAL VISUAL IMPACTS OF THE PROPOSED DEVELOPMENT

The assessment of visual impacts is based on a synthesis of criteria including nature of impact, extent, duration of the impact, intensity, probability of occurrence, reversibility, irreplaceable loss of resources, cumulative effect and level of significance.



## 7.1 Nature of the impact

The nature of the visual impacts will be the visual effect the activity would have on the receiving environment. These visual impacts will be:

Pre-construction phase:

- Removal of some vegetation will be required for earthworks. Some vegetation would also be cleared for building thereby increasing the visibility of the site and resulting in a loss of the vegetation visual resource.

Construction phase:

- During construction, earthworks would create cut and fill with slopes and would result in visual scarring of the landscape.

Operational phase:

- A portion of the development site is currently undeveloped and covered in vegetation. The development would result in a change in visual character from a landscape covered in vegetation and without buildings to a built landscape.

## 7.2 Impact assessment criteria

The following impact assessment significance ratings indicate the impacts on the criteria to follow, in terms of the development visual impact (approved layout) and additional the impact significance of the proposed amendments to the layout (proposal) when compared to what is currently approved. In other words, the impact significance of the development has already been assessed and approved and the only the impact significance of the proposed amendments to the current layout need to be taken into consideration for decision making purposes.

### 7.2.1.1 The extent of the impact

*The spatial or geographic area of influence of the visual impact:*

Approved Development: the extent of the impact of the development is local (limited to the immediate surroundings).

Proposed Amendments: the extent of the impact of the proposed amendment is local / does not differ from that which is currently approved (limited to the immediate surroundings)

### 7.2.1.2 Duration of the project

*The predicted lifespan of the visual impact:*

Approved Development: the duration of impacts for the development ranges from short-term (duration of the construction phase) to permanent (time will not mitigate the visual impact).

Proposed Amendments: the duration of impacts for the Proposed amendments ranges from short-term (duration of the construction phase) to permanent (time will not mitigate the visual impact). The only difference for these criteria is that the construction phase may extend longer than the approved layout due to the increase in units, this, however, may not completely be the case as this increase could be easily mitigated by increasing the number and machinery of the development teams physically constructing the houses.

### 7.2.1.3 The intensity of the impact

*The magnitude of the impact on views, scenic or cultural resources (intensity of the impacts):*

Approved Development: the intensity of the impacts for the development will be medium (visual and scenic resources are affected to a limited extent).

Proposed Amendments: the intensity of the impacts of the Proposed Amendments will remain medium (visual and scenic resources are affected to a limited extent).



#### 7.2.1.4 The probability of the impact

*The degree of possibility of the visual impact occurring (probability of the impact occurring):*

Approved Development: the probability of the impact occurring for the development will be highly probable (most likely that the impact will occur).

Proposed Amendments: the probability of the impact occurring for the Proposed Amendment will be highly probable (most likely that the impact will occur).

#### 7.2.1.5 Reversibility

Approved Development: The reversibility of the approved development is barely reversible (the impact is unlikely to be reversed even with intense mitigation measures).

Proposed Amendments: The reversibility of the Proposed Amendments is barely reversible (the impact is unlikely to be reversed even with intense mitigation measures).

#### 7.2.1.6 Irreplaceable loss of resources

Approved Development: The degree to which resources will be irreplaceably lost due to the approved development is significant.

Proposed Amendments: The degree to which resources will be irreplaceably lost due to the proposed amendment will remain significant.

#### 7.2.1.7 Cumulative effect

An effect that in itself may not be significant but may become significant if added to other existing or potential impacts that may result from activities associated with the proposed development.

Approved Development: The cumulative impacts of the approved development before mitigation are high and after mitigation medium

Proposed Amendments: The cumulative impacts of the Proposed Amendments before mitigation are high and after mitigation medium

#### 7.2.1.8 Significance

The significance of impacts is determined through a synthesis of the assessment criteria. The significance of the impacts of the proposed development is medium that will require considerable mitigation measures to achieve an acceptable level of impact.

### 7.3 Conclusion

Although the visual impact of the development as a whole is significant and the intensity of the visual impact medium after mitigation, these impacts and their significance have already been approved. The proposed amendments themselves, however, when compared to what is currently approved, are not significant in terms of the visual impact. This is largely because the footprint will remain relatively unchanged (except for some increases in the open spaces) and the height restrictions of certain units on the edges of the development, remain in force with the proposed amendment.

The Retirement Resort, Business Zone III and the General Residential Zone III located directly next to the Retirement Resort will not be very visible due to the lower topography that screens views into this portion of the development. The remainder of the development will be very visible due to its location on the elevated topographical sections of the property (Figures 7, 12-20).



## 8. VISUAL CONSTRAINTS & MITIGATION

Visual resource Management Africa completed a visual impact assessment for the development in 2008 that included mitigation measures. The following mitigation measures are not intended to replace the existing mitigation measures but complement them.

### 8.1 Visual mitigation measures

General visual mitigation principles to reduce visual impact can be categorised as:

- On-site treatments to reduce visual effects; and
- Treatments at viewer locations to reduce visual sensitivity.

On-site treatments involve rehabilitation of landforms and land cover, while viewer location treatments involve a range of treatments to screen views, filter views and/or re-orientate primary views.

On-site treatments might include:

- Visual and ecological planting patterns of indigenous vegetation to achieve landscape patterns that emulate in part existing mixes of tree and grass cover in the surrounding landscape.
- Minimising exposure of work areas to sensitive receptors.
- Preparing an internal landscape plan for rehabilitation areas.

At viewer location treatments include:

- Landscape design and plantings for affected locations. This will require an appropriately qualified person to visit the affected locations and develop a landscape plan to screen or filter views of the project areas.

Design fundamentals are general design principles that can be used for all forms of activity or development, regardless of the resource value being addressed. Applying the following three fundamentals will assist with mitigation measures:

- Proper siting or location.
- Reducing unnecessary disturbance.
- Repeating the elements of form, line, colour and texture of the surrounding landscape.

Design strategies are more specific activities that can be applied to address visual design problems. The following strategies will not necessarily apply to every proposed activity or project:

- Colour selection
- Earthwork
- Vegetative manipulation
- Structures
- Reclamation/Restoration
- Linear alignment design considerations

The fundamentals and strategies mentioned above are all interconnected, and when used together, can help resolve visual impacts from proposed activities or developments.

#### 8.1.1 Reducing unnecessary disturbance

As a general rule, reducing the amount of land disturbed during the construction of a project reduces the extent of visual impact. Measures relevant to the project include:

- Retain as much of the existing vegetation as possible and where practical screen construction activities from key viewing locations. This is also referred to as vegetation manipulation.



- Establish limits of disturbance that reflect the minimum area required for construction.
- Existing vegetation should be retained where possible through the use of retaining walls.

#### 8.1.2 Colour selection

The selection of the best colour for the planned project will have the greatest impact on the visual success or failure of the project. Strong contrasts in colour create easily recognizable visual conflicts in the landscape. Measures relevant to the project include:

- The selection of colours that blend with or are in harmony with the surrounding landscape will drastically reduce the visual impact of the project
- Galvanized steel on structures should be darkened to prevent glare. Low-lustre paints should be used wherever possible to reduce glare.

#### 8.1.3 Reduce contrasts from earthworks

The scars left by excessive cut and fill activities during construction often leave long-lasting negative visual impacts. Once the dark surface soil layer is disturbed, exposing the much lighter colour of the subsurface soil, a strong contrast is created that may take many years to recover.

There are several ways to reduce the contrasts created by earthwork construction. Proper location and alignment are the most important factors. Fitting the proposed project infrastructure to the existing landforms in a manner that minimizes the size of cuts and fills will greatly reduce visual impacts from earthwork. Other earthwork design techniques, such as balancing cut and fill or constructing with all fill or all cut should be considered, where appropriate, as methods to reduce strong visual impacts. Measures relevant to the project include:

- The scars left by excessive cut and fill activities during construction often leave long-lasting negative visual impacts. Where possible fitting the proposed project infrastructure to the existing landforms in a manner that minimizes the size of cuts and fills will greatly reduce visual impacts from earthwork.
- The dumping of excess rock and earth on downhill slopes should be limited.

#### 8.1.4 Development and architectural guidelines

Development and building guidelines need to address procedural, planning and aesthetic considerations required for the successful design and development of the property and the architectural ethos of the development. The purpose of design guidelines is to protect and safeguard the environment and scenic resources and guide the appropriate architectural character to protect the investment value of the development. The guidelines should not be restrictive conditions but should promote an overall design sensitivity whilst allowing flexibility for individual expression.

#### 8.1.5 Landscaping

A Landscape Plan must be drawn up by a professionally registered Landscape Architect. The objective of the Landscape Plan must be:

- To identify and retain indigenous trees and shrubs that will visually screen the development.
- To provide a planting plan of indigenous trees and shrubs for streets and open spaces that will allow for the medium – long-term visual screening of the development and enhance the living environment of the owners and residents.
- To draw up a management plan for phasing in indigenous trees and phasing out exotic trees such that the proposed development will always be screened from sensitive receptors, by trees. The plan should include the planting of fast-growing, pioneer-type trees, trees with a medium growth rate and those that have a slower growth rate. This management plan should be for a minimum of 20 years and should be monitored and revised every 5 years.



- To provide Landscape Guidelines for homeowners. Planting of lawn alone exacerbates the visibility of the units. The mix of lawn, shrubs and trees should be carefully designed with the importance of trees and large shrubs emphasized, to provide further greening of the built environment.
- To draw up a Landscape Operational Maintenance Plan for the Homeowners Association to manage the shared open spaces beyond individual erf boundaries.
- To provide guidelines on visually permeable boundary treatments, using fencing for the most part and walls at entrances only. No precast concrete walls.

#### 8.1.6 Lightning design

Effective light management needs to be incorporated into the design of the lighting to ensure that the visual influence is limited to the power station, without jeopardising operational safety and security.

Several measures can be implemented to reduce light pollution and those relevant to the project are as follows:

- Where possible construction activities should be conducted behind noise/light barriers that could include vegetation screens.
- Low flux lamps and the direction of fixed lights toward the ground should be implemented where practical. Choose “full-cut off shielded” fixtures that keep light from going uselessly up or sideways. Full cut-off light fixtures produce minimum glare. They increase safety because you see illuminated people, cars, and terrain, not dazzling bulbs. If you can see the bright bulb from a distance, it’s a bad light. With a good light, you see lit ground instead of the dazzling bulb. “Glare” is light that beams directly from a bulb into your eye.
- The design of night lighting should be kept to a minimum level required for operations and safety
- The utilisation of specific frequency LED lighting with a green hue on perimeter security fencing.
- Where feasible, put lights on timers to turn them off each night after they are no longer needed

#### 8.1.7 Restoration and reclamation

Strategies for restoration and reclamation are very much similar to the design strategies for earthwork, as well as the design fundamentals of repeating form, line, colour, and texture and reducing unnecessary disturbance. The objectives of restoration and reclamation include reducing long-term visual impacts by decreasing the amount of disturbed area and blending the disturbed area into the natural environment while still providing for project operations.

Though restoration and reclamation are separate parts of project design, they should not be forgotten or ignored. It is always a good idea to require a restoration/reclamation plan as part of the original design package. All areas of disturbance that are not needed for operation and maintenance should be restored as closely as possible to previous conditions. Measures relevant to the project include:

- The objective of restoration and reclamation efforts is to reduce the long-term visual impacts by decreasing the amount of disturbed area and blending the disturbed area into the natural environment while still providing for project operations.
- Topsoil should be stripped, saved, and replaced on earth surfaces disturbed by construction activities.
- Planting holes should be established on cut/fill slopes to retain water and seeds.
- Indigenous plant species should be selected to rehabilitate disturbed areas.
- Where possible rehabilitation efforts should emulate surrounding landscape patterns in terms of colour, texture and vegetation continuums.
- Replacing soil, brush, rocks and forest debris over disturbed earth surfaces when appropriate, thus allowing for natural regeneration rather than introducing an unnatural-looking grass cover.
- Revegetation of disturbed areas should occur as soon as practicable possible after the completion of various construction activities.



## 8.2 Monitoring program

The potential visual impacts and proposed mitigation thereof must be undertaken by a professionally registered landscape architect that must be part of the design team (including engineers and architects). The brief of the landscape architect (LA) must include:

- The LA must consult with both engineers and architects to ensure that sensitive earthwork and building design development occurs, which will allow for reducing the construction and operation phase visual impacts.
- The LA must work with the project surveyor, arborist and planners in establishing which trees are to remain on site for visual screening and taking this information into the design development of the civil and building works.
- The LA must prepare a landscape plan, design development thereof and monitoring implementation and thereafter maintenance. The plan must include the tree survey and what trees are, what indigenous vegetation is, to be retained, what is to be removed, the planting of indigenous trees, new trees and shrub planting along roadways and in open spaces in the built areas and a guideline document for private gardens within the development.

## 9. REFERENCES

AEA Technology plc (AEAT). (1998). Power Generation and the Environment - a UK Perspective, Volume 1. Report AEAT 3776. Culham, Oxfordshire.

Atkins Planning. (1986). First Report on the Visual Impact of Large Wind Turbines, Report ETSU-WN-1057/1.

Bergsjö, A., Nilsson, K., & Skarback, E. (1982). Wind Power in the Landscape. Fourth Symposium on Wind Energy Systems, 21-24 September 1982, (p. Paper N2). Stockholm, Sweden.

Bishop, I. D. (no date). Determination of thresholds of visual impact: the case of wind turbines: Environment and Planning B: Planning and Design.

British Wind Energy Association (BWEA). (1994). Best Practice Guidelines for Wind Energy Development. London.

Council of Europe (2000). The European landscape convention. Strasbourg: Council of Europe.

Fisher, P. F. (1995). An exploration of probable view-sheds in landscape planning. Environment and Planning B: Planning and Design 22, 527-546.

Hankinson, Moira (1999). Landscape and Visual Impact Assessment. In Petts, Judith (Ed), Handbook of Environmental Impact Assessment. Volume 1. Blackwell Science, Oxford, pp347-373.

Hill, M., Briggs, J., Minto, P., Bagnall, D., Foley, K. & Williams, A. (2001). Guide to Best Practice in Seascape Assessment. Maritime Ireland/Wales INTERREG Report No 5. The Marine Institute, Dublin.

Hull, R. B. I., & Bishop, I. D. (1988). Scenic impacts of electricity transmission towers: the influence of landscape type and observer distance. Journal of Environmental Management, 27, 99-108.

Mazehan, S.M., Shuib, B.K., and Hashim, H., 2013, Value of Rural Landscape from Public Perspectives, Proceedings of the International Conference on Social Science Research, ICSSR 2013 (e-ISBN 978-967-11768-1-8). 4-5 June 2013, Penang, Malaysia

McKenna, G., 2009. Techniques for creating Mining Landforms with Natural appearance. Techniques for creating mining landforms with natural appearance, Proceedings of Tailings and Mine Waste 2009 Conference. Banff, Alberta. November 1-4, 2009. The University of Alberta Geotechnical Centre, Edmonton.



Miller, David R & Morrice, Jane G (no date). A Geographical Analysis of the Intervisibility of the Coastal Areas of Wales. Unpublished report, Macaulay Land Use Research Institute, Aberdeen.

Oberholzer, B. (2005). Guideline for involving visual & aesthetic specialists in EIA processes: Edition 1. CSIR Report No ENV-S-C 2005 053 F. Republic of South Africa, Provincial Government of the Western Cape, Department of Environmental Affairs & Development Planning, Cape Town.

Panero, Julius and Zelnik, Martin (1979). Human Dimension & Interior Space – A Source Book of Design Reference Standards, The Architectural Press Ltd. London.

Pun, D.P., 2004, Rural Landscape Change: Landscape Practices, Values and Meanings. The Case of Jagatpur VDC, Chitwan Nepal, Master of Philosophy in Social Change - Department of Geography, Norwegian University of Science and Technology (NTNU), Trondheim, Norway

Schor, H.J. and Gray, D.H., 2007. Landforming: an environmental approach to hillside development, mine reclamation and watershed restoration. John Wiley & Sons, Hoboken, NJ. 35

The Landscape Institute and the Institute of Environmental Management & Assessment - Guidelines for Landscape and Visual Impact Assessment (2005). Second Edition. Guidelines for Landscape and Visual Impact Assessment.

Transport Research Board, National cooperative highway research program, Report 741, Evaluation of Methodologies for Visual Impact Assessments. Washington, D.C. (2013).

United States Department of Interior, Bureau of Land Management (1984), Visual resource management: Washington, D.C., BLM Manual Handbook H-8400, Rel. 8-24.

United States Department of Agriculture - Forestry Service (1995). Landscape Aesthetics: A Handbook for Scenery Management. Handbook Number 701.

Velarde, M.D., Fry, G., and Tveit, B., 2007. Health effects of viewing landscapes – Landscape types in environmental psychology. Urban Forestry & Urban Greening 6 (2007) 199–212.

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