PROPOSED OLIFANTSHOEK 132kV POWERLINE, NORTHERN CAPE PROVINCE

VISUAL IMPACT ASSESSMENT REPORT

FEBRUARY 2020

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1 INTRODUCTION

1.1 GENERAL

This Landscape and Visual Impact Assessment (LVIA) study forms part of the Basic Assessment that is being undertaken for the proposed new 36km Olifantshoek 132KV, Power Line, Northern Cape Province by Savannah Environmental (Pty) Ltd on behalf of the Gamagara Local Municipality.

In terms of the EIA Regulations promulgated under the amended National Environmental Management Act (NEMA) Act No. 107 of 1998, the proposed development of the infrastructure requires environmental authorisation. An impact to be assessed comprises the visual impact that the infrastructure will have on the surrounding landscape and receptors.

The assessment is based on one site visit that was undertaken on the 5th February 2020. The weather during the site visit was clear enabling long distance views which provided the assessor with a clear understanding of the likely maximum visibility of the proposed development and the likely implications for influencing the character of the affected landscape.

During the site visit access was not possible to all homesteads that are likely to be affected by the proposedalignment. Where access was not possible and the use could not be confirmed, it has been assumed that they are inhabited.

1.2 PROJECT LOCATION

The project is located in the Olifantshoek region of the Northern Cape Province, within ward 3 and ward 4 of the Gamagara Local Municipality and ward 6 of the Tatsebane Local Municipality,(Map 1: Locality Map).

The study area extends from a power line connection point at its northern extremity at the Emil Switching Station and extends for approximately 36km to the south to an authorisedsubstation on the eastern edge of the town of Olifantshoek.

A new 10MVA 132/11KV substation has been authorised but has yet to be constructed on the eastern side of Olifantshoek close to the N14. The proposed new power line will connect tothis substation.

The approximate geographic coordinates for the substation location and onnection to the existing Emil Switching Stationare;

CONNECTION POINT TO EMIL SWITCHING STATION			
South	27^0	44’	10.04”
East	22^0	55’	13.52”
NEW 10MVA 132/11KV SUBSTATION LOCATION			
South	27^0	56’	11.27”
East	22^0	44’	28.95”

From the Emil Switching Station, the alignment roughly follows the eastern bank of an intermittent stream course (Ga Mogara) to a position approximately 9km south east of the Switching Station. From this point, the power line runs south-west for

approximately 21km where it meets the Ferrum/Nieuwehoop 400kV line. At this point the alignment turns to the south, south, east to run parallel with the Ferrum/Nieuwehoop 400kV line for approximately 2km. The alignment crosses the N14 and immediately on the southern side of this road it turns to the east and runs parallel to the N14 for approximately 7km linking into the new 10MVA 132/11KVsubstation at the end of this section.

1.3 BACKGROUND OF SPECIALIST

Jon Marshall (Pr. LArch, CMLI, EAPSA, Dip LA) qualified as a Landscape Architect in 1978. He has also had extensive experience working as an Environmental Impact Assessment Practitioner. He has been involved in Visual Impact Assessment over a period of approximately 30 years. He has developed the necessary computer skills to prepare viewshed analysis (zone of theoretical visibility) and three dimensional modelling to illustrate impact assessments. He has undertaken visual impact assessments for major buildings, mining, industrial development, mining and infrastructure projects and has been involved in the preparation of visual guidelines for large scale developments. Jon is responsible for the LVIA and for report writing.

Refer to **Appendix I** for brief Curriculum Vitae.

1.4 BRIEF AND RELEVANT GUIDELINES

The brief is to assess the visual impact that the facility will have on the surrounding landscape and sensitive receptors.

Work has been undertaken in accordance with the following guideline documents;

a. The Government of the Western Cape Guideline for Involving Visual and Aesthetic Specialists in EIA Processes (Western Cape Guideline), which is the only local relevant guideline, setting various levels of assessment subject to the nature of the proposed development and surrounding landscape; and

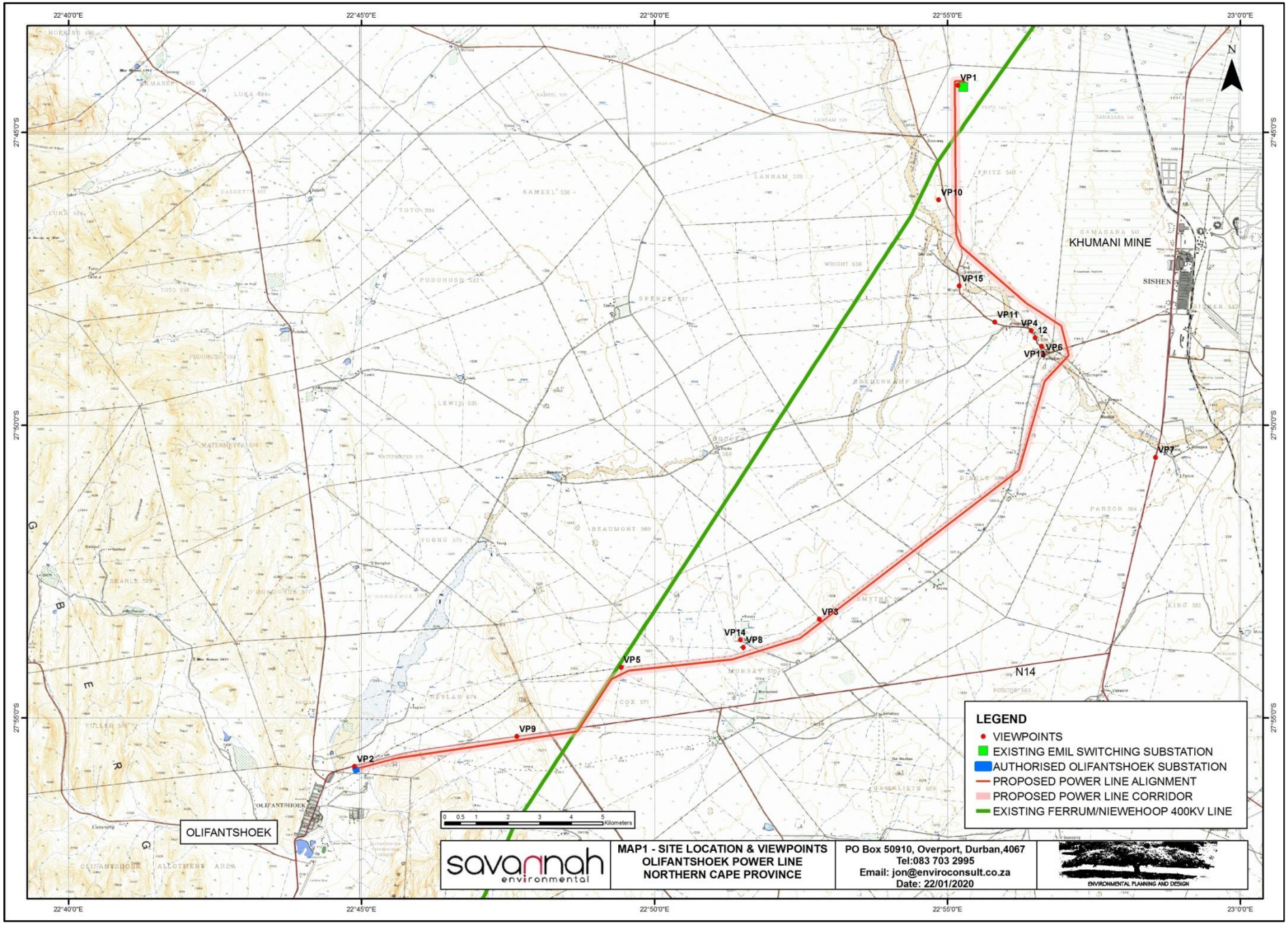
b. The Landscape Institute and Institute of Environmental Management and Assessment (UK) Guidelines for Landscape and Visual Impact Assessment which provides detail of international best practice (UK Guidelines).

Refer to **Appendix II** for the Western Cape Guideline.

A Level 3 Assessment has been undertaken in accordance with the Western Cape Guidelines. This typically requires;

- Identification of issues raised in scoping phase, and site visit;
- Description of the receiving environment and the proposed project;
- Establishment of view catchment area, view corridors, viewpoints and receptors;
- Indication of potential visual impacts using established criteria;
- Inclusion of potential lighting impacts at night;
- Description of alternatives, mitigation measures and monitoring programmes.
- Review by independent, experienced visual specialist (if required).

This general methodology has been adopted in preparation of this assessment.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AUTHORISED OLIFANTSHOEK SUBSTATION
PROPOSED POWER LINE ALIGNMENT
PROPOSED POWER LINE CORRIDOR
EXISTING FERRUM/NIEWEHOOP 400KV LINE
0 0.5 1 2 3 4 5 Kilometers
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MAP1 - SITE LOCATION & VIEWPOINTS
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2. PROJECT DESCRIPTION AND CONTEXT

2.1 MOTIVATION

The Gamagara Local Municipality is proposing to establish a 132kV power line which will be used to increase customers Notified Maximum Demand (NMD) from 2.5MVA to 10 MVA as a provision for future developments within the municipal area.

2.2 PROJECT DESCRIPTION

The Olifantshoek 132kV Power Line development will be comprised of the following:

- A new overhead 132kV power line approximately 36km long to connect directly to the Emil Switching Station (**Plate 1**) via a new substation on the eastern edge of Olifantshoek and close to the N14 that has been authorised by the Department of Environmental Affairs (DEA) (**Plate 2**); and
- The possible development corridor of the new power line is 300m with aservitude of 31m wide.

Towers associated with the power line are expected to be an average height of 16-28m . The pylons are expected to be self-sustaining steel monopole structures (Plate 3).

The construction of the proposed 132kV overhead power line is likely to follow the following sequence;

- Excavation and concrete work for tower bases. Due to the dispersed nature of the bases, it is unlikely for concrete to be batched on site. It is likely that concrete will be ready mixed and brought in by concrete trucks as and when required.

- Erection of towers in a progressive manner. It is common for materials for a number of poles to be delivered to site at the same time. Erection requires the use of a mobile crane to hold prefabricated elements in position. This process is relatively rapid as each pole / pylon is prefabricated off site.

- Stringing of cables which also requires the use of cranes and mobile hoists to enable workers to fix insulators and attachments and to pull cables between towers.

The above process is relatively clean, rapid and only directly affects the area immediately surrounding each tower location.

An operating servitude will have to be registered in favour of the Eskom Holdings SOC Limited to protect the alignment. The servitude will prevent development and any other use that could compromise the overhead power line. It will not prevent current agricultural uses or access beneath the power line.

The following typical dimensions are likely to apply to the project;

- Tower height: 16-20m subject to tower selection.
- Tower spacing: 200m – 400m subject to terrain.
- Operating servitude: 31m

Refer to Map 1 for the proposed alignment.

Plate 1, View of Emil Switching Station from VP1.

Plate 2, View of the site of the authorised new substation on the eastern edge of Olifantshoek as seen from VP2.

2.3 ALTERNATIVES

No alternatives are currently under consideration. However, two alternative alignments were considered in a previous application neither of which were authorised.

Plate 3,Typical 23-28m high 132kV self-sustaining steel monopole tower.

3 DESCRIPTION OF RECEIVING ENVIRONMENT AND POSSIBLE RECEPTORS

3.1 LANDSCAPE CHARACTER

Landscape character is defined by the UK Guidelines as "a distinct, recognisable and consistent pattern of elements in the landscape that makes one landscape different from another".

The proposed power line development corridor is located within the floor of a broad valley system that generally falls from the south to the north.

The landscape surrounding the corridor is arid, comprising relatively flat drainage plains with rocky outcrops to the south, east and west forming the valley sides.

The majority of the area surrounding the proposed corridor appears relatively natural. On the eastern flank of the valley there is a large mining area. The settlements of Kathu and Olifantshoek are also located on the western and eastern sides of the valley respectively.

To the north, west and south of the proposed corridor, the main land use appears to be agricultural and specificallylow intensity grazing interspersed with isolated homesteads that are concentrated to the south west and south east of the proposed corridor.Landscape Character is a composite of a number of influencing factors including:

- Landform and drainage;
- Nature and density of development; and
- Vegetation patterns.

From the site visit the following characteristics have been identified.

3.1.1 Landform and Drainage

The proposed power line will cross a broad valley floor from north east to south west, crossing two non-perennial water courses (Ga-Mogara and Olifansloop) that drain the valley towards the north.

Whilst the valley floor is relatively flat, because the proposed power line is aligned from the north east to the south west and the valley falls towards the north, the elevation of the line increases as it runs to the south west. At its connection point at the Emil Switching Station the elevation is approximately 1170m amsl. As the power line approaches the N14, its elevation is approximately 1350m amsl.

There are minor ridgelines and highpoints within the valley floor that rise in the order of 10-20m above surrounding levels.

At the N14, the alignment turns to the west and crosses steeper and rockier terrain associated with the valley side (Langberg) as it approaches Olifantshoek and the substation where the ground elevation is approximately 1370m amsl.

The visual implications of landform are;

- Because for the majority of its alignment the proposed power line traverses a largely flat area, landform may not play a major role in screening although minor ridgelines and highpoints combined with existing vegetation could be significant; and
- The authorised substation is located within an area of more rugged topography, landform may help to screen the eastern most section of the proposed alignment.

Refer to Map 2, Landform and Drainage.

3.1.2 Nature of Development and Land Uses

The population density of the area immediately surrounding the proposed development varies.

Kathu is the largest town and Olifantshoek is the second largest town of the five towns within the Gamagara Local Municipality. However, both are relatively small towns and during the 2011 census, the municipality had a total population of approximately 41,617 people approximately 71% of which are based in urban areas.

The area of the Municipality is 2,619km^2.

Rural homesteads were found to have an average occupancy of 3.5 people. There is a rural homestead for approximately every 0.75km^2.

Given the province's dry conditions and dependence on irrigation, many Northern Cape farmers are branching out into value-added activities such as game farming. This is apparent in rural areas surrounding the proposed alignment as low intensity grazing appears to be mixed with game farming, hunting operations and bush lodges.

From the site visit it appears that the general area and particularly the broad valley floor is used for cattle and game farming.

During the site visit as many homesteads as possible were visited in order to ascertain their use. A description of various homesteads is included in Section 3.2 (Visual Receptors).

Olifantshoek is primarily a rural service centre. It is likely also that a proportion of its economy is derived from local mining operations as well as its position on the N14 as it acts as a transit stop for travellers including tourists.

Apart from agriculture, mining is the largest economic activity in the area. Kathu is the centre of this activity. Mines in the area include iron ore and manganese. The mine to the west of Kathu and east of the northern section of the proposed power line is the Khumani Manganese Mine.

In addition to Khumani, there are numerous areas of degraded land as indicated on **Map 3**. It is possible that these areas have resulted from formal and informal mining operations.

Refer to Map 3, Land Use.

Plate 4, The valley floor with minor ridgelines and high points as seen from VP 3 looking south. This area is generally used for cattle and game farming.

Plate 5, Existing homestead located to the west of the alignment (VP4) that appears to be uninhabited due to the lack of a roof.

Plate 6, Existing homestead located close to the intersection between the proposed power line corridor and the existing Ferrum / Niewehoop 400kV Power Line (VP5) that appears to be used on a temporary basis for stock management.

Plate 7, Existing homestead located to the west of the alignment (VP6)that appears to be inhabited.

Plate 8, Khumani Manganese Mine close to the eastern section of the power line alignment as seen from VP7.

3.1.3 Vegetation Patterns

According to Mucina & Rutherford (2006), the proposed power line alignment crosses a relatively natural area. The vegetation types include;

- Olifantshoek Plains Thornveld
- Kathu Bushveld
- Koranna-Langeberg Mountain Bushveld

Allvegetation types are usually open tree and shrub cover with a sparse grass layer.

From observations on site, the tree layer is often above eye level.

Visual implications include;

- Where the viewer is amongst natural vegetation, it is possible that there will be a degree of screening provided by the natural vegetation.
- Where the viewer is set back from natural vegetation or where ground elevation provides a slightly elevated overview of the landscape, the extent of screening provided by natural vegetation is likely to be limited.

Within and around the town of Olifantshoek where the proposed overhead power line terminates at therecently authorisedsubstation, vegetation patterns have been highly modified. Within the main street and adjacent gardens there is many taller trees and shrubs that tend to limit visibility. The area around the town has also been degraded by human activity which has had the effect of reducing indigenous tree and shrub cover. In some areas, this has had the effect of opening up longer views than might

be possible within more natural areas. In other areas it has resulted in the development of alien invasive species that have the effect of increasing screening.

Refer to Map 4, Vegetation Types.

3.1.4 Landscape Character Areas, Visual Absorption Capacity (VAC) and Significance

Landscape Character Areas (LCAs) are defined as "single unique areas which are the discrete geographical areas of a particular landscape type".

The overriding character differentiating factors within the subject landscape appear to be landform and development.

Visual Absorption Capacity (VAC) is definedas the landscape's ability to absorb physical changes without transformation in its visual character and quality. Where elements that contrast with existing landscape character are proposed, VAC is dependent on elements such as landform, vegetation and other development to provide screening of a new element. The scale and texture of a landscape is also critical in providing VAC, for example; a new large scale industrial development located within a rural small scale field pattern is likely to be all the more obvious due to its scale.

The landform appears to divide the landscape into four discrete areas including;

a) **The Upland Landscape Character Area** associated with the Langsberg on the valley sideswhich largely contain the development and within which the south western section of the overhead power line is located. This area is incised by minor valleys and is generally covered by natural thorn veld. Settlement is sparse and consists of isolated homesteads. The area is primarily important for agricultural production; however, it also provides a variety of environments for ecotourism activities. It also provides a backdrop to the lowland landscape. VAC due to landform is likely to be relatively high.
b) **The Lowland Landscape Character Area**which is comprised of the valley floor within which the majority of the proposed power line will be located**.** This generally consists of relatively flat topography that is covered with natural thorn veld. low intensity grazing is the predominant agricultural activity. In areas land owners have diversified into game farming, hunting and bush lodges. Scattered homesteads are apparent in the landscape. VAC is likely to be relatively low due to the flat topography, however, particularly in flat areas where vegetation extends above head height VAC could be relatively high.
c) **The Urban Landscape Character Area,** particularly the urban area of Olifantshoek that can be characterised by dense development. This area is primarily important as a living environment forresidents. VAC within the settlement is likely to be high due to vegetation and buildings. On the edges of the settlement however VAC may be reduced due to the degraded nature of natural vegetation.
d) **The Mining Landscape Character Area** which although not directly affected they add a significant industrial element to the character of the area surrounding them.The only focus of this area is the extraction of iron and manganese ore.

The LCAs are indicated on **Map 5, Landscape Character Areas.**

3.2 VISUAL RECEPTORS

Visual Receptors are defined as "individuals and / or defined groups of people who have the potential to be affected by the proposal".

This section is intended to highlight possible receptors within the landscape which due to use could be sensitive to landscape change. They include;

- Area Receptors that includethe urban area of Olifantshoek. From the site visit it is highly unlikely that the formal urban area will be affected, however, there are a number of informal dwellings close to the authorised substation location on the eastern edge of Olifantshoek from which the proposed power line may be visible.
- Point Receptors that include homesteads that are scattered throughout the area. It is likely that the focus for this area is mainly agricultural production. However, from the site visit it is obvious that homesteads fall into the following categories:
    - Homesteads that are obviously just residential structures. These include game lodges and private homes. It is likely that these homesteads will have the greatest sensitivity to possible views of the proposed power line.
    - Homesteads that are incorporated into working farmsteads that might include a number of other buildings such as workshops, storage facilities and farm workers accommodation. It is likely that residents of these dwellings will be concerned about the productivity of the land and the safety of their livestock ahead of the nature of the outlook.
    - Homesteads that are stand alone workers accommodation. These structures include facilities that are obviously associated with stock watering and handling some of which are probably used on a temporary basis during specific management operations. They also include structures that are permanently occupied. In terms of significance, it seems likely that occupants of these buildings are likely to be mainly focused on the job in hand. The surrounding landscape is likely to be a minor consideration.
- Linear Receptors that includes the N14. The N14 is a primary tourism route.

LANDSCAPE CHARACTER AREAS

Plate 9, UrbanLandscape Character Area

Plate 10, Mining Landscape Character Area

LANDSCAPE CHARACTER AREAS

Plates 11, Lowland LandscapeCharacter Area

Plate12, Upland LandscapeCharacter Area

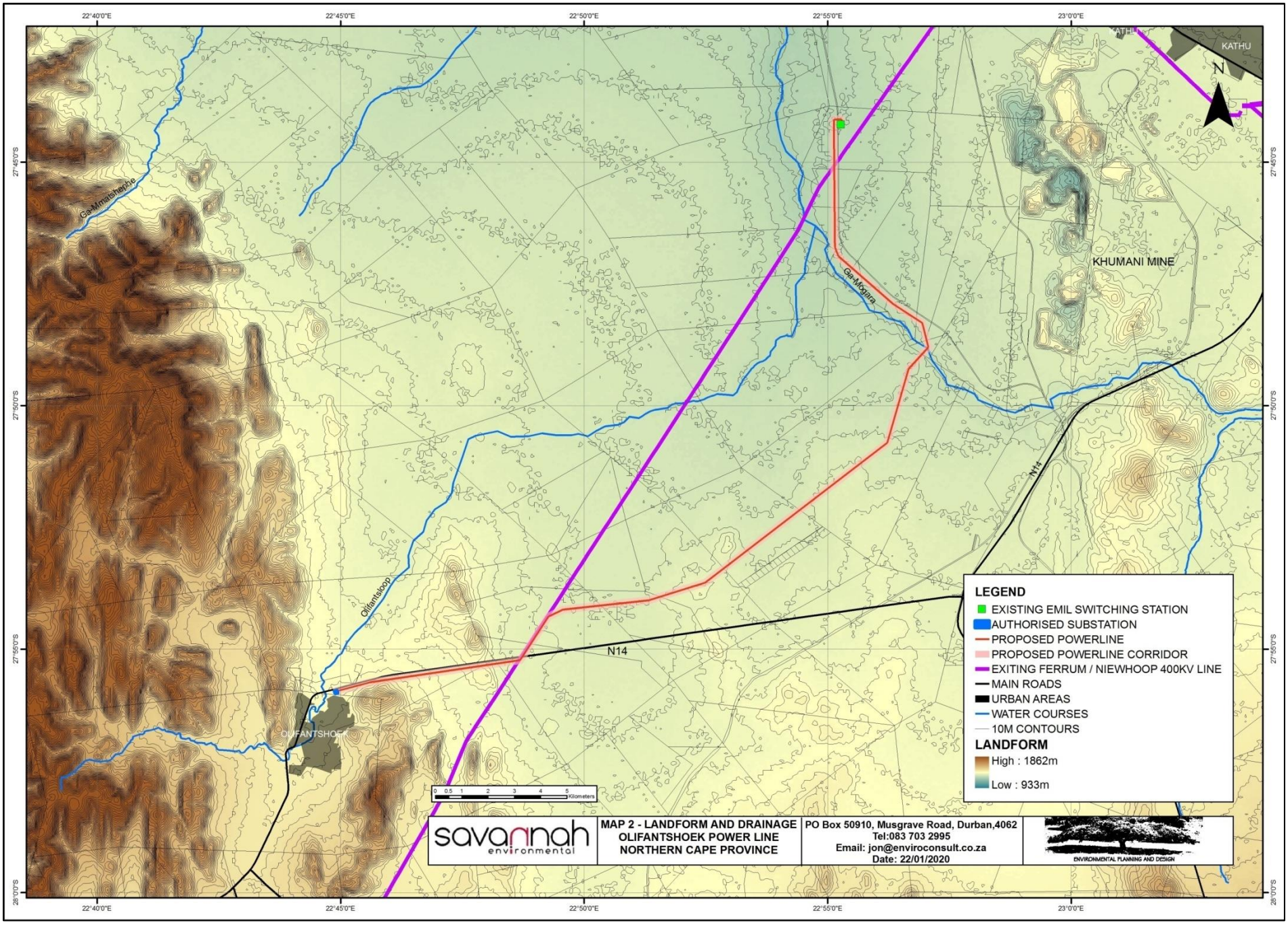
POSSIBLE SENSITIVE RECEIVERS

Plate 13, Informal homes close to the eastern edge of Olifantshoekand close to the authorised Substation as viewed from VP2

Plate 14, Rural Homesteads close to the Powerline (VP8).

POSSIBLE SENSITIVE RECEIVERS

Plate 15, The N14 (VP9).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Ga-Mogara
KHUMANI MINE
N14
Olifantshoop
OLIFANTSHOEK
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LEGEND
EXISTING EMIL SWITCHING STATION
AUTHORISED SUBSTATION
PROPOSED POWERLINE
PROPOSED POWERLINE CORRIDOR
EXITING FERRUM / NIEWHOOP 400KV LINE
MAIN ROADS
URBAN AREAS
WATER COURSES
10M CONTOURS
LANDFORM
High : 1862m
Low : 933m
savannah environmental
MAP 2 - LANDFORM AND DRAINAGE
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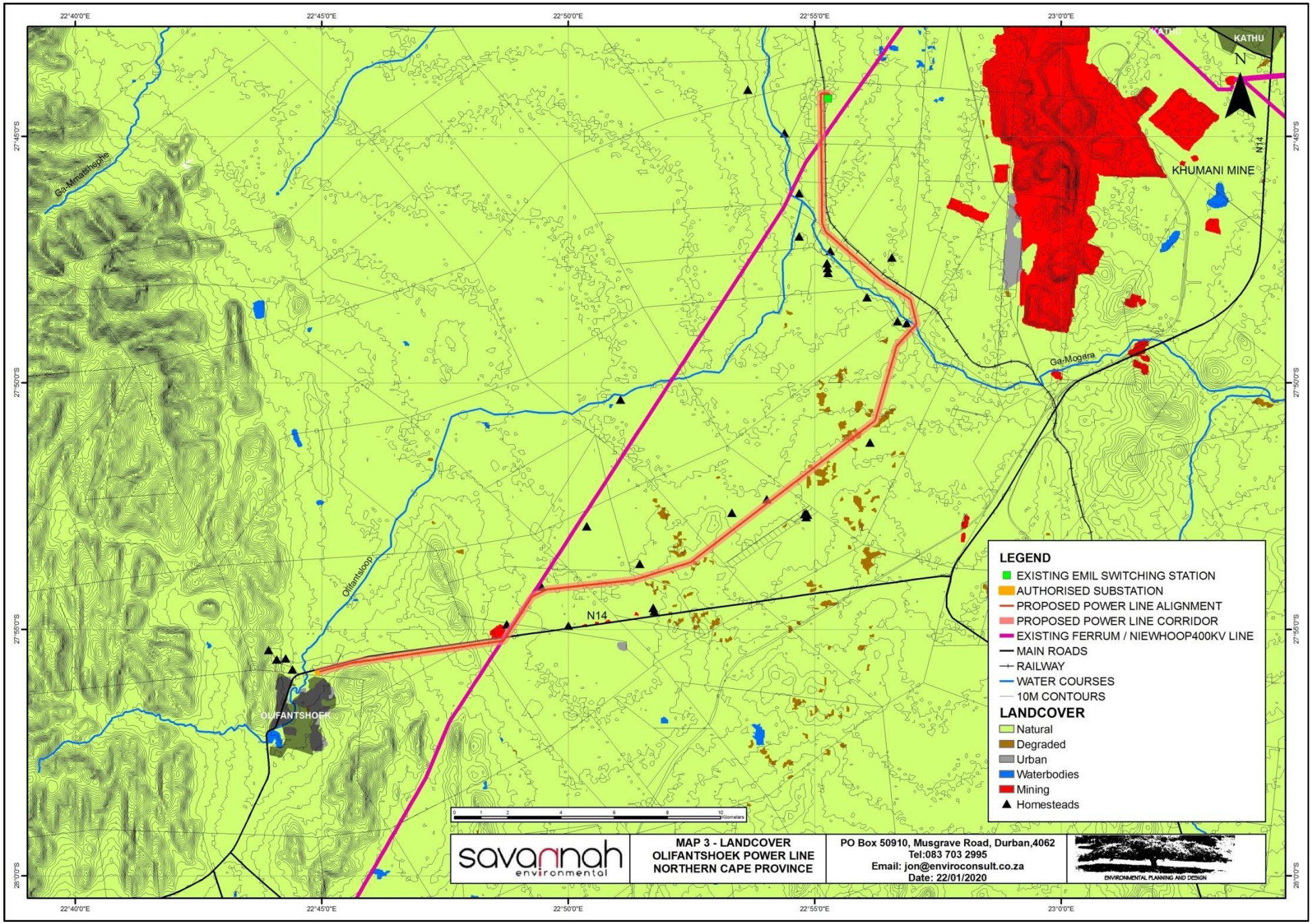
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Olifantsloop
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AUTHORISED SUBSTATION
PROPOSED POWER LINE ALIGNMENT
PROPOSED POWER LINE CORRIDOR
EXISTING FERRUM / NIEWHOOP400KV LINE
MAIN ROADS
RAILWAY
WATER COURSES
10M CONTOURS
LANDCOVER
Natural
Degraded
Urban
Waterbodies
Mining
Homesteads
0 1 2 4 6 8 10 Kilometers
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MAP 3 - LANDCOVER
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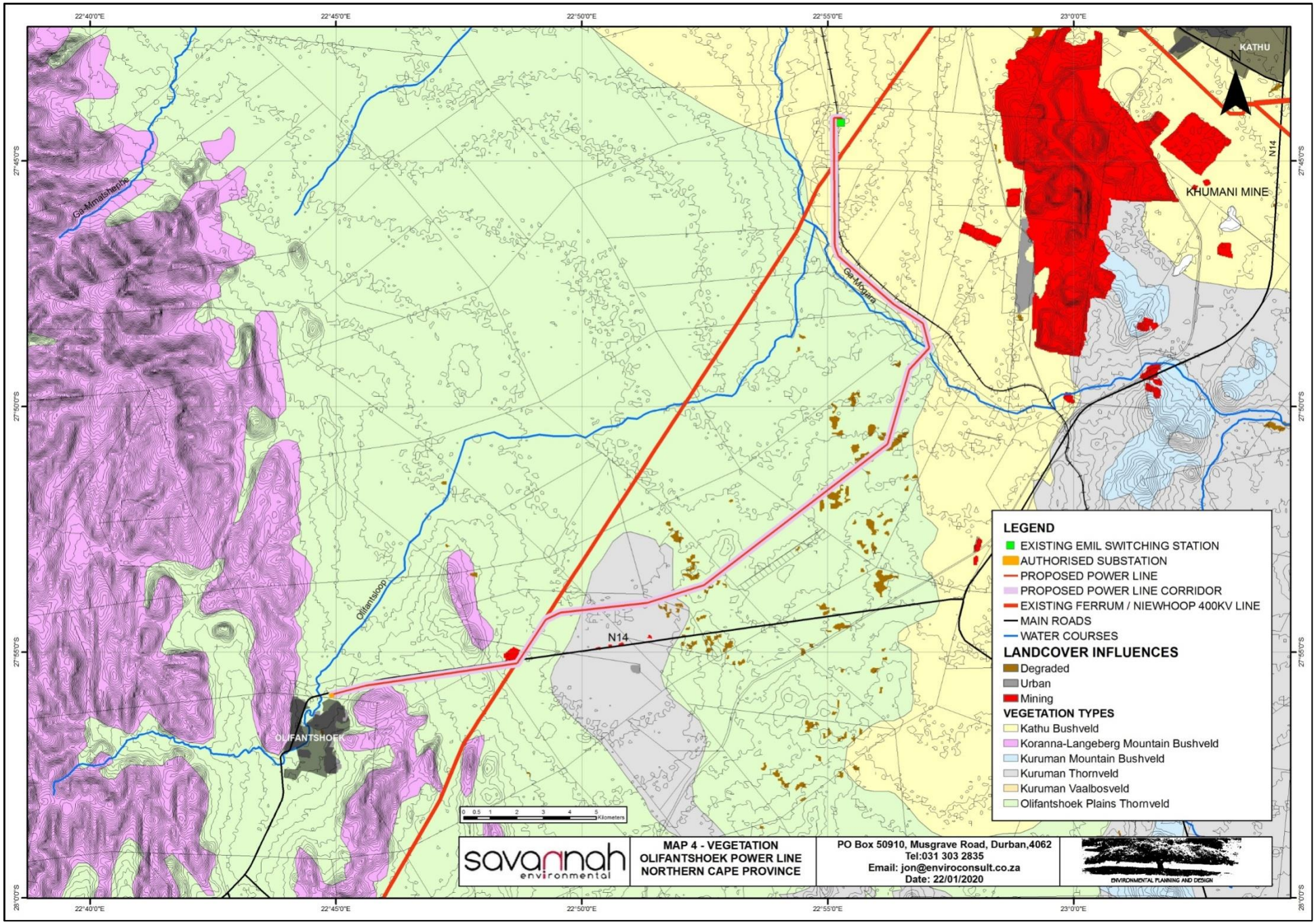
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VEGETATION TYPES
Kathu Bushveld
Koranna-Langeberg Mountain Bushveld
Kuruman Mountain Bushveld
Kuruman Thornveld
Kuruman Vaalbosveld
Olifantshoek Plains Thornveld
savannah environmental
MAP 4 - VEGETATION
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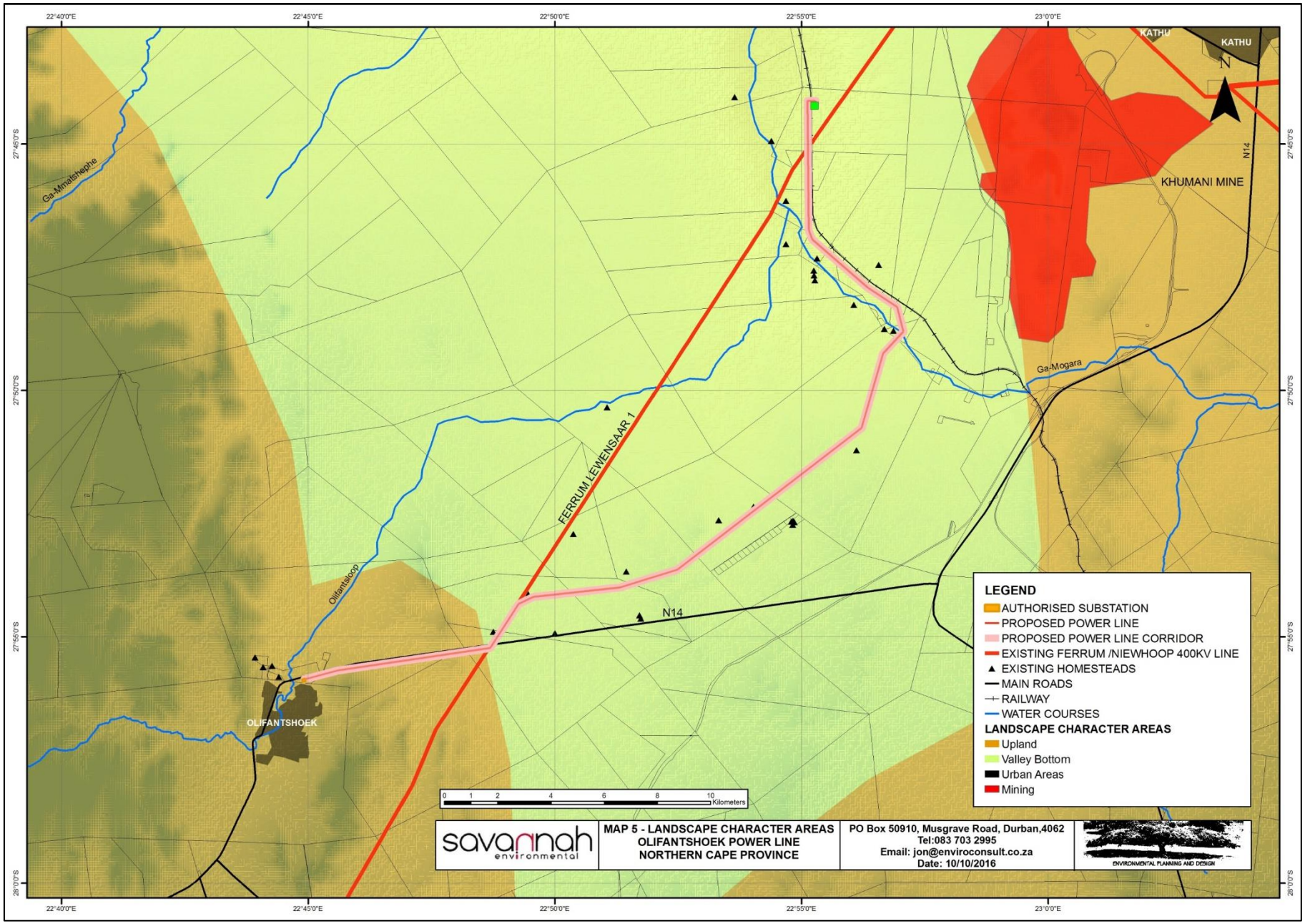
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MAIN ROADS
RAILWAY
WATER COURSES
LANDSCAPE CHARACTER AREAS
Upland
Valley Bottom
Urban Areas
Mining
0 1 2 4 6 8 10 Kilometers
savannah environmental
MAP 5 - LANDSCAPE CHARACTER AREAS
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4 THE NATURE OF POTENTIAL VISUA L IMPACTS

4.1 GENERAL

Impacts could include general degradation of the Landscape Character Areas due to the development that may detract from the existing character as well as change of view for affected people and / or activities;

a. Generally landscape change or degradation. This is particularly important for protected areas where the landscape character might be deemed to be exceptional or rare. However it can also be important in non-protected areas particularly where landscape character is critical to a specific broad scale use such as tourism areas or for general enjoyment of an area. This is generally assessed by the breaking down of a landscape into components that make up the overall character and understanding how proposed elements may change the balance of the various elements. The height, mass, form and colour of new elements all help to make new elements more or less obvious as does the structure of an existing landscape which can provide screening ability or texture that helps to assimilate new elements. This effect is known as visual absorption capacity.
b. Change in specific views within the affected area from which the character of a view may be important for a specific use or enjoyment of the area.
    - Visual intrusion is a change in a view of a landscape that reduces the quality of the view. This can be a highly subjective judgement. Subjectivity has however been removed as far as is possible by classifying the landscape character of each area and providing a description of the change in the landscape that will occur due to the proposed development. The subjective part of the assessment is to define whether the impact is negative or positive. Again to make the assessment as objective as possible, the judgement is based on the level of dependency of the use in question on existing landscape characteristics.
    - Visual obstruction is the blocking of views or foreshortening of views. This can generally be measured in terms of extent.

    Due to the nature of the proposed development, visual impacts are expected to relate largely to intrusion.

4.2 THE NATURE OF LIKELY VIEWS OF THE DEVELOPMENT

The proposed development consists of a132kV overhead power line. The maximum height of the power line is approximately 20m. The support towers are proposed as mono pole structures(**Plate 3**).

Plate 16 - A typical view along the line of a 132kv overhead power line with monopole towers.

Towers are typically placed at changes in direction, at high points on the alignment and at spacing along the power line up to 400m apart. Towers used at changes in direction usually have a larger cross section in order to take directional loads imposed by the line.

Plate 16indicates a typical view along the line of a 132kV overhead power line. The views are taken during a period of good visibility along the line of towers which have a spacing of +/- 250m. In total 9 towers are visible along the line before it connects to a line running at right angles. The last tower in the line which is a solid pole structure is just visible at +/-2.5km.

From the photographs and considering the backdrop, the following conclusions can be drawn;

a) Due largely to the monopolestructure and matt grey colour of the galvanised steel from which it is constructed, visibility of overhead power line structures reduces significantly with distance.

b) The visual mass of the overhead power line is unlikely to be obvious from distances greater than 2.5km.

For a section of the proposed 132kV power line alignment it is proposed to run adjacent to an existing 400kV overhead power line. This infrastructure is approximately 35m high and its structures have greater mass when compared with the 132kV power line. The impact of the proposed 132kV power line is therefore expected to fall within the impact area of the existing structure.

From observations of similar 400kV overhead power lines to existing, the lines are obvious up to a distance of 5km **(Plate 17).**

The impact area associated with the section of the proposed 132kV power line alignment that runs in close proximity to the existing 400kV line will fall within the impact area associated with the existing line. As indicated below, the impact area of a typical 400kV line is likely to extend significantly further than the proposed 132kV line.

Plate 17 - 400kV double overhead transmission lines. Pylons are obvious in the mid distance (approximately 2-3km) but are not highly conspicuous at a distance (approximately 5-6km) as they cross the ridgeline.

5 VISIBILITY OF THE PROPOSED DEVELOPMENT

5.1 ZONES OF THEORETICAL VISIBILITY

Zones of Theoretical Visibility (ZTV) are defined as "a map usually digitally produced showing areas of land within which a development is theoretically visible".

ZVTs of the proposed development have been assessed using Arc Spatial Analyst GIS.

The assessment is based on terrain data that has been derived from satellite imagery. This data was originally prepared by NASSA and is freely available on the CIAT-CCAFS website (http://www.cgiar-csi.org). This data has been ground truthed using a GPS as well as an online mapping programme.

Whilst the ZTV has been calculated from terrain data only, existing vegetation and development could have a significant modifying effect on the areas indicated.

5.2 ASSESSMENT LIMIT

The GIS based assessment of Zones of Theoretical Visibility does not take the curvature of the earth or reduction in scale due to distance into account. In order to provide an indication of the likely limit of visibility due to this effect a universally accepted navigational calculation (**Appendix IV**) has been used to calculate the likely distance that the proposed structures might be visible over. This indicates that in a flat landscape a structure 28m high could be visible at a distance of approximately 19km. However at this distance limitations of the human eye will not be able to distinguish elements of the project from other landscape features.

As indicated in Section 4, from observations of similar overhead power lines, the proposed 132kV overhead power line is unlikely to be obvious at a distance greater than 2.5 – 3.0km.The assessment therefore focuses on an area within 3.0km of the proposed development.

5.3 APPROACH TO THE ASSESSMENT

5.3.1 ZTV and Limit of Visual Influence

Map 6 indicates the ZTV Analysis for all the proposed power line.

A 3km buffer from the power line is indicated on the ZTV to highlight the area within which the proposed facility is likely to be visible and obvious. Outside this limit it is possible that the proposed power line could be visible but it is unlikely to be obvious to the naked eye.

Whilst the ZTV analysis is a useful indicator of likely general areas of impact, because of subtle differences in the nature and proximity of homesteads to the proposed development it is important that these are considered in greater detail. In order to enable this, **Maps 7 and 8** indicate the location of identified homesteads relative to the proposed power line corridor. Homesteads Mapping also indicates the nature of each homestead as detailed in Section 3.2 (Visual Receptors).

5.4 VISIBILITY OF DEVELOPMENT

5.4.1 General

From the ZTV analysis, the following conclusions can be drawn;

a) Within the Lowland LCA, theproposed 132kV overhead power line will impact the entire area over which it could be obvious (within 3km).
b) Within the Upland LCA the topography is will help to screen the development from small sections of the surrounding landscape.

5.4.2 Affected Homesteads

There are a number of homesteads within the Lowland LCA that lie close to the proposed 132kV power line. There are twenty three of these properties that within the 3km buffer of the proposed power line. Of these six are private houses, nine are farmsteads and eight are either workers accommodation or are structures that are used on a occasional basis for stock management activities. Private housed include H2, H12, H13, H14, H15 and H23. Farmsteads include H11, H19 and H21. Workers accommodation includes H4, H5, H7, H16, H17, H18, H20 and H22. Maps 7 and 8 indicate the proximity of these homesteads to the proposed power line.

a) Homestead (private house) H2 is within 800m of the proposed power line, however, it is located in a depression such that views towards the proposed alignment are not possible from the house. The house is also surrounded by natural vegetation that generally rises above head height such that views of the line from the general property area will also be screened
b) Homesteads (private houses) H12, H13, H14 and H15 are grouped close together such that they appear to be a small residential development. The closest structure is approximately 1.1km from the proposed power line. These properties were not visited during the site visit however, from google earth, it is evident that there are numerous mature trees around the buildings such that views towards the proposed power line are likely to be significantly screened;
c) Homestead 23 (private house) is located immediately next to a brick making operation and has the existing 400kV Ferrum / Newehoop Power Line running within 200m to the east between the structure and the proposed 132kV power line. From discussion with personnel at the brick works, the house is used by a person employed at the facility. The existing 400kV line is obvious from the house. The proposed 132kV line is unlikely to be highly obvious though due to mature existing vegetation around the house;
d) Homesteads H1, H3, H7 and H8 (farmsteads) are all located between 800m and 1200m from the proposed power line. These groups of buildings also all have significant amounts of mature vegetation around them that is likely to screen views towards the proposed power line;
e) Homesteads H9 and H10 (farmsteads) are located approximately 600m and 270m respectively from the proposed power line. As with most other homesteads, there is a significant amount of existing mature vegetation that will at least partially screen views or the development. There is also another small power line of similar scale to the one proposed that is located in closer proximity to these homesteads (450m and 180m respectively);
f) Homestead H11 (farmstead) is located approximately 550m from the proposed power line. This location was not accessible during the site visit. However, this homestead appears to be surrounded by numerous mature trees that are likely to screen the power line from most areas within the area of the homestead.
g) Homestead H17 (farmstead) is located approximately 510m from the proposed power line. There also appears to be a significant amount of mature vegetation between the homestead and the proposed power line that is likely to provide significant screening.
h) Homestead H19 (farmstead) is located approximately 510m from the proposed power line. There is a significant amount of mature vegetation around the homestead which is also located in a depression, however, there is an open view corridor to the south of the main house through which the proposed power line is

likely to be visible. There is however an existing power line that is of similar scale to the proposed line that is approximately 400m from the main house and will be seen in front of the proposed power line.

i) Homestead H21 (farmstead) is located close to the N14 and approximately 1350m from the proposed power line. The homestead is orientated towards the road and away from the power line. There is also a significant amount of mature vegetation around the homestead and between the homestead and the proposed power line that will completely screen the development.
j) Homesteads H4, H5 and H7 (workers accommodation) are located approximately 380m, 780m and 1100m from the proposed power line respectively. Whilst there is some vegetation located between the homesteads and the proposed power line that will help to partially screen the development, it is likely that the proposed power line will be obvious particularly from the closest homestead.
k) Homestead H16 (workers accommodation) is located approximately 123m from the proposed power line. Whilst this homestead was not visited, it appears that there is little vegetation that will provide screening. The proposed power line is likely to be obvious.
l) Homestead H18 (workers accommodation). It is possible that this homestead could also be a small farmstead. The closest structure is approximately 910m from the proposed power line. There also appears to be a significant amount of mature vegetation around the buildings that is likely to provide significant screening.
m) Homestead H20 (workers accommodation) is located close to the N14 and approximately 1200m from the proposed power line. There is a significant amount of mature vegetation around the homestead and between the homestead and the proposed power line that is likely to completely screen the development.
n) Homestead H22 (workers accommodation) is located approximately 180m from the proposed power line and close to the point where the proposed power line alignment meets the existing 400Kv Ferrum / Niewhoop power line. From the site visit, this structure appears to be used only occasionally possibly when cattle / game management operations are underway as it is located close to a watering station.
o) H14, approximately 1200m from the proposed power line. There is a significant amount of mature vegetation around the homestead and between the homestead and the proposed power line that is likely to completely screen the development.

Plate 18, View of Homestead H2 which is set in a depression and surrounded by mature trees (VP 10).

Plate 19, View of Homestead H8 (VP 11). Note the homestead is backed by mature trees that will screen the proposed power line.

Plate 20, Viewof Homesteads H9 and H10 (VP 12). Note existing power line running close to the homesteads.

Plate 21, View of Homestead H10 (VP 13). Note existing mature trees within and around the homestead.

Plate 22, View from homestead H19 (VP 14). Note existing power line on the ridgeline. The proposed power line is likely to be a similar scale and will be seen approximately 100m further from the homestead.

Plate 23, View of homestead H7 (VP 15). Note the landscape is relatively open so the power line is likely to be visible.

Plate 24, View of homestead H22 (VP 5). Note the structure was obviously not occupied at the time of the site visit. The 400kV Ferrum / Niewhoop power line can be seen in the background. Existing vegetation is likely to largely screen the proposed power line from the structure.

5.4.3 The N14

a) The existing Ferrum / Niewhoop 400kV overhead power line crosses the N14 approximately 6.5km to the east of Olifantshoek. The proposed power line crosses road immediately to the east of this existing line. Due to its height and visual mass, the existing 400kV line visually affects a significantly larger area than the proposed power line will (**Plate 17**). The proposed power line will therefore not extend the impact footprint of the road crossing.

b) To the east of the road crossing, other than on the approach to the road crossing, the closest that the proposed power line is likely to be to the N14 is approximately 1.4km. At this distance the proposed power line is likely to be visible, however, it is unlikely to be highly obvious. Existing vegetation will also partially screen views of the facility from the road.

c) To the west of the road crossing, the proposed power line alignment follows the south side of the N14. The proposed corridor is set back approximately 120m from the road edge. There is also a significant amount of mature vegetation adjacent to the road that is largely above the driver's eye height. Apart from the occasional rise in the road where an overview of the landscape is possible, for the majority of this section, the proposed power line is likely to be largely screened from motorists.

Plate 25, The N14 west of the proposed road crossing looking towards Olifantshoek (VP 9). Note: the proposed corridor is located approximately 120m from the left side of the road. As existing vegetation is largely higher than the drivers eye height, this set back is likely to be sufficient to ensure that the line is largely screened from the road.

5.4.4 The Urban Area of Olifantshoek

a) Because the power line is located in close proximity and links to the substation on the eastern edge of Olifantshoek, and because of the extent of natural vegetation on this side of the urban area, the proposed power line is unlikely to have any significant impact on the formal section of the settlement. There is however a small area of informal settlement on the eastern side of the town. However, the authorised substation will largely be located between this informal area and the proposed power line. The proposed power line also terminates approximately 1000m from any formal or informal housing, therefore, at this distance and due to the extent of the natural trees in the area, the proposed power line is unlikely to be visible (**Plate 9**).

5.5 CUMULATIVE IMPACTS

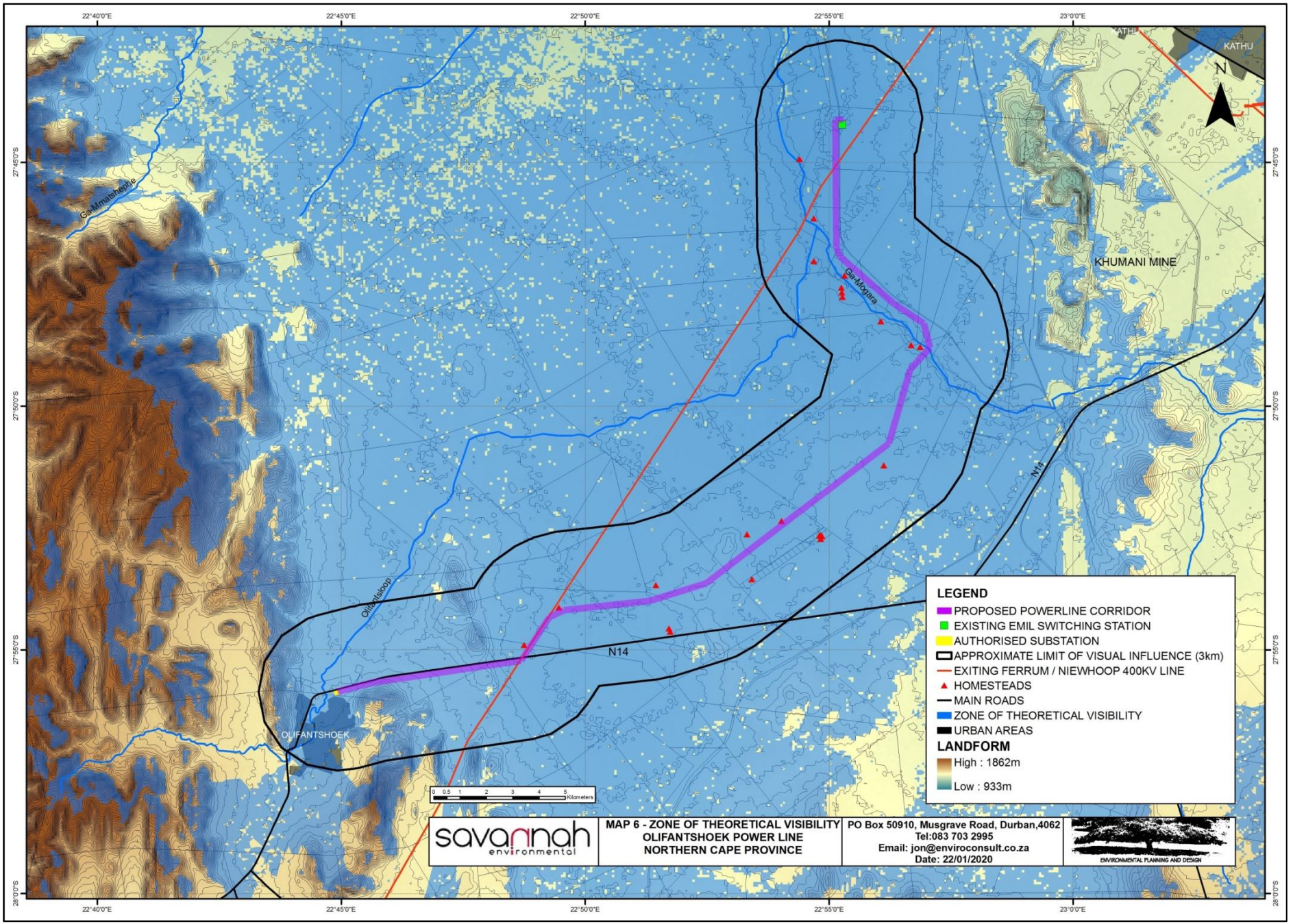
To the east of the N14 road crossing, the majority of the proposed alignment will follow an existing medium voltage overhead power line that is likely to be similar in scale to the proposed 132kV line. This will mean that the proposed power line will not impact a new section of the landscape, it is however likey to intensify current impacst associated with the exiting power line.

The proposed N14 road crossing will slightly intensify the current impact associated with the 400kV overhead power line. However due to the fact that the proposed line is lower and the structures are less imposing, it will not extend the current impact area.

It is possible that the proposed 132kV line could intensify existing impacts for three homesteads (H16, H17 and H19). These homesteads are currently impacted by another overhead line that is located closer to them than the proposed line.

The proposed 132kV power line between the N14 road crossing and Olifantshoek will add additional electrical infrastructure to the roadside landscape of the N14 for approximately 6-7km of its length.

Plate 26, Existing overhead power line as seen from VP 3. Note: the proposed power line will follow this power line to the east of the N14 road crossing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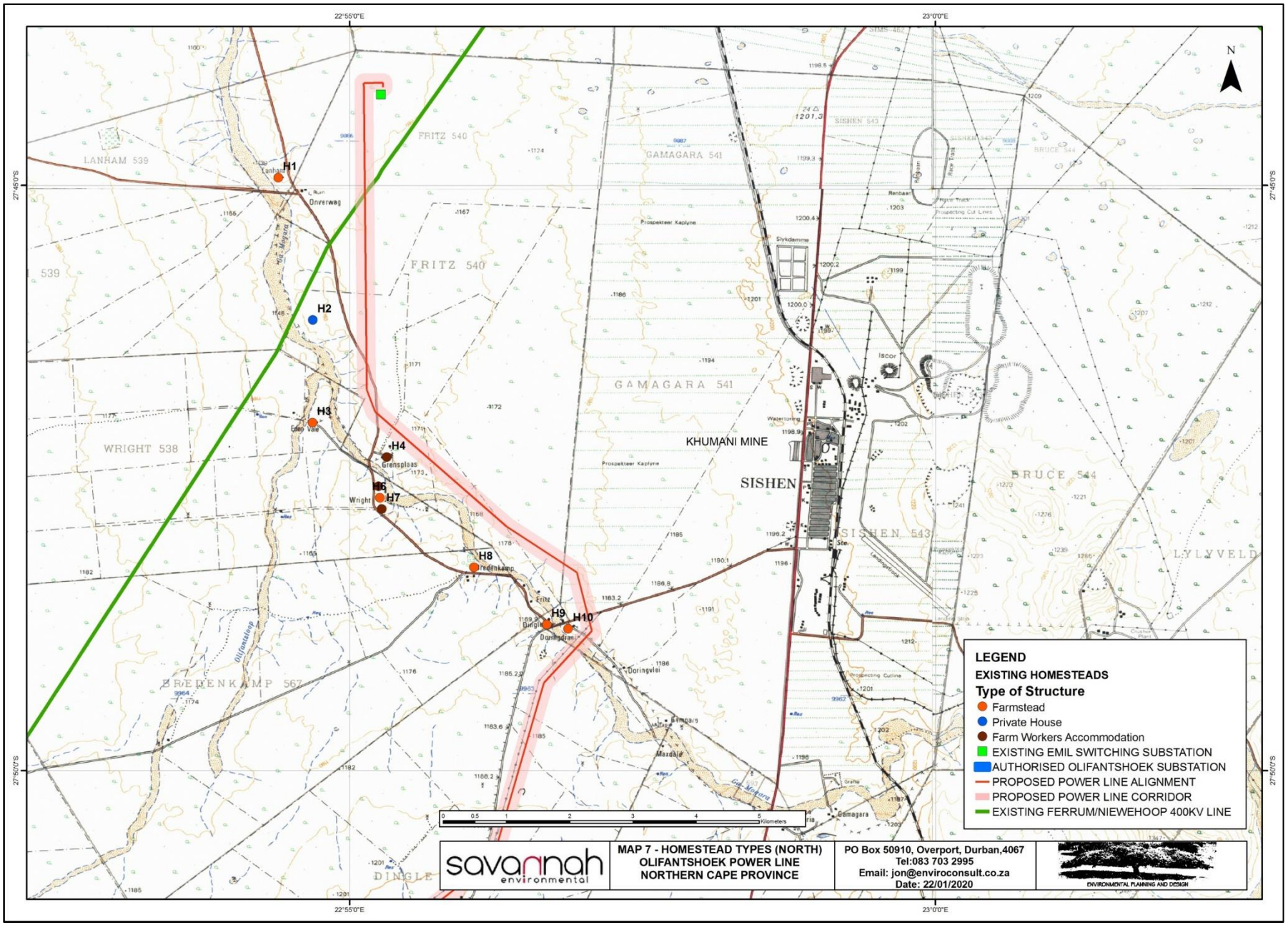
28°0'0"S
KATHU
N
Ga-Mmatshephe
KHUMANI MINE
Ga-Mogara
Olifantshoop
N14
N14
OLIFANTSHOEK
0 0.5 1 2 3 4 5 Kilometers
LEGEND
PROPOSED POWERLINE CORRIDOR
EXISTING EMIL SWITCHING STATION
AUTHORISED SUBSTATION
APPROXIMATE LIMIT OF VISUAL INFLUENCE (3km)
EXITING FERRUM / NIEWHOOP 400KV LINE
HOMESTEADS
MAIN ROADS
ZONE OF THEORETICAL VISIBILITY
URBAN AREAS
LANDFORM
High : 1862m
Low : 933m
savannah environmental
MAP 6 - ZONE OF THEORETICAL VISIBILITY
OLIFANTSHOEK POWER LINE
NORTHERN CAPE PROVINCE
PO Box 50910, Musgrave Road, Durban,4062
Tel:083 703 2995
Email: jon@enviroconsult.co.za
Date: 22/01/2020
ENVIRONMENTAL PLANNING AND DESIGN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N
H1
H2
H3
H4
H5
H6
H7
H8
H9
H10
LANHAM 539
FRITZ 540
GAMAGARA 541
WRIGHT 538
BREDENKAMP 567
SISHEN 543
BRUCE 544
LYLYVELD
KHUMANI MINE
SISHEN
Iscor
Onverwag
Grensplaas
Wright
Fritz
Doringvlei
Gamagara
Olifantshoekspruit
LEGEND
EXISTING HOMESTEADS
Type of Structure
Farmstead
Private House
Farm Workers Accommodation
EXISTING EMIL SWITCHING SUBSTATION
AUTHORISED OLIFANTSHOEK SUBSTATION
PROPOSED POWER LINE ALIGNMENT
PROPOSED POWER LINE CORRIDOR
EXISTING FERRUM/NIEWEHOOP 400KV LINE
0 0.5 1 2 3 4 5 Kilometers
savannah environmental
MAP 7 - HOMESTEAD TYPES (NORTH)
OLIFANTSHOEK POWER LINE
NORTHERN CAPE PROVINCE
PO Box 50910, Overport, Durban,4067
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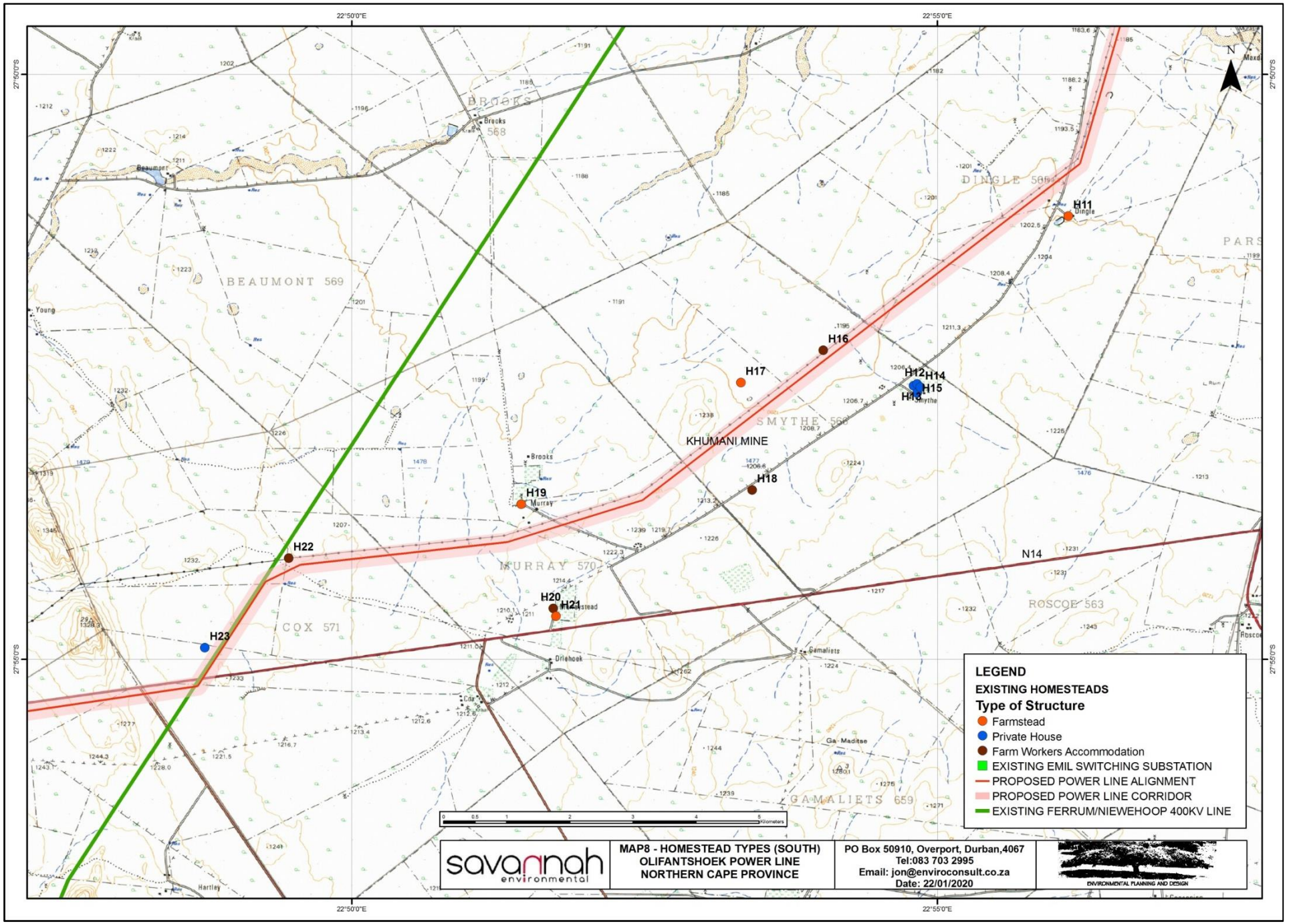
Date: 22/01/2020
ENVIRONMENTAL PLANNING AND DESIGN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BEAUMONT 569
BROOKS 568
DINGLE 566
SMYTHE 565
MURRAY 570
COX 571
ROSCOE 563
GAMALIETS 659
KHUMANI MINE
H11
H12
H13
H14
H15
H16
H17
H18
H19
H20
H21
H22
H23
N14
Beaumont
Brooks
Young
Murray
Driehoek
Gamaliets
Ga-Maditse
Hartley
LEGEND
EXISTING HOMESTEADS
Type of Structure
Farmstead
Private House
Farm Workers Accommodation
EXISTING EMIL SWITCHING SUBSTATION
PROPOSED POWER LINE ALIGNMENT
PROPOSED POWER LINE CORRIDOR
EXISTING FERRUM/NIEWEHOOP 400KV LINE
savannah environmental
MAP8 - HOMESTEAD TYPES (SOUTH)
OLIFANTSHOEK POWER LINE
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Date: 22/01/2020
ENVIRONMENTAL PLANNING AND DESIGN

VISUAL IMPACT ASSESSMENT

6.1 ASSESSMENT METHODOLOGY

The previous section of the report identified specific areas where visual impactsmay occur. This section will quantify these impacts in their respective geographical locations and in terms of the identified issues (see Section1.5).

The methodology for the assessment of potential visual impacts includes:

- The **nature**, which shall include a description of what causes the effect, what will be affected and how it will be affected.
- The **extent**, wherein it will be indicated whether the impact will be local (limited to the immediate area or site of development) or regional:
    - local extending only as far as the development site area – assigned a score of 1;
    - limited to the site and its immediate surroundings (up to 10 km) – assigned a score of 2;
    - will have an impact on the region – assigned a score of 3;
    - will have an impact on a national scale – assigned a score of 4; or
    - will have an impact across international borders – assigned a score of 5.
- The **duration**, wherein it will be indicated whether:
    - the lifetime of the impact will be of a very short duration (0–1 years) – assigned a score of 1;
    - the lifetime of the impact will be of a short duration (2-5 years) - assigned a score of 2;
    - medium-term (5–15 years) – assigned a score of 3;
    - long term (> 15 years) - assigned a score of 4; or
    - permanent - assigned a score of 5.
- The **magnitude**, quantified on a scale from 0-10, where a score is assigned:
    - 0 is small and will have no effect on the environment;
    - 2 is minor and will not result in an impact on processes;
    - 4 is low and will cause a slight impact on processes;
    - 6 is moderate and will result in processes continuing but in a modified way;
    - 8 is high (processes are altered to the extent that they temporarily cease); and
    - 10 is very high and results in complete destruction of patterns and permanent cessation of processes.
- The **probability** *of occurrence*, which shall describe the likelihood of the impact actually occurring. Probability will be estimated on a scale, and a score assigned:
    - Assigned a score of 1–5, where 1 is very improbable (probably will not happen);
    - Assigned a score of 2 is improbable (some possibility, but low likelihood);
    - Assigned a score of 3 is probable (distinct possibility);
    - Assigned a score of 4 is highly probable (most likely); and
    - Assigned a score of 5 is definite (impact will occur regardless of any prevention measures).
- The **significance**, which shall be determined through a synthesis of the characteristics described above (refer formula below) and can be assessed as low, medium or high.
- The **status**, which will be described as either positive, negative or neutral.
- The degree to which the impact can be reversed.

- The degree to which the impact may cause irreplaceable loss of resources.
- The *degree* to which the impact can be *mitigated.*
- The **significance** is determined by combining the criteria in the following formula:
    - S=(E+D+M)P; whereS = Significance weighting, E = Extent, D = Duration, M = Magnitude, P = Probability

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

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

6.2 ASSESSMENT

The following assessment focuses first on general landscape change that will occur due to the proposed development which provides context for the assessment of impacts on identified sensitive receptors. Key receptors that are considered include;

- Homesteads;
- Travellers on the N14; and
- residents of Olifantshoek

It should be noted that the impacts identified are likely gradually increase from the current situation to the impact level indicated during the construction phase, be consistent at the impact levels during the operational phase and decrease again from the levels indicated to close to the current situation during the decommissioning phase.

6.2.1 Impact of the Proposed Development on General Landscape Character

Nature of impact:
Degradation of the character of the existing landscape. This is particularly relevant to existing natural areas (Lowland and Upland LCAs) where there is a possibility that the development could introduce industrial components.

	Without mitigation	**With mitigation**
Extent	Immediate surroundings, **(2)**	Immediate surroundings, **(2)**
Duration	Long term, **(4)**	Long term, **(4)**
Magnitude	Low, **(4)**	Minor,**(2)**
Probability	Probable, **(3)**	Improbable, **(2)**
Significance	Low / Medium, **(30)**	Low,**(16)**
Status	The character of the rural landscape will be changed. It is likely that the influence of industrial elements will not be highly obvious to the majority of people.	**Neutral - negative**

	It is likely that the majority of people will not consider the sight of a small overhead power line as a negative impact. **Neutral - negative**	
Irreplaceable loss	**No irreplaceable loss**	**No irreplaceable loss**
Can impacts be mitigated?	**Yes**	

Mitigation / Management:

» Planning: Retain / re-establish and maintain natural vegetation in all areas outside of the development footprint/servitude.
» Ensure that vegetation is not unnecessarily removed during the construction period.
» Ensure that rubble, litter, and disused construction materials are appropriately stored (if not removed daily) and then disposed of regularly at appropriately licensed waste facilities.
» Reduce the construction period as far as possible through careful logistical planning and productive implementation of resources.
» Align power line as far from the N14 as possible within the identified corridor particularly to the west of the proposed N14 road crossing.
» Align power line as far from homesteads as possible within the identified corridor.

Cumulative Impacts:

The proposed 132kV overhead power line will add marginally to the local intensity of existing impacts within the Lowland LCA. It will also extend the impact into the Upland LCA as the alignments run along the N14 towards Olifantshoek.

Residual Risks:

Lack of rehabilitation on decommissioning could result in degraded areas.

CONSTRUCTION, OPERATION AND DECOMMISSIONING PHASE IMPACTS

6.2.2 Impact of the Proposed Development on Identified Sensitive Receptors

Potential visual impacts on sensitive receptors that have been identified through the site visit include;

a) The visibility of the proposed power line to and visual impact on Local homesteads.
b) The visibility of the proposed power line to and visual impact on the N14.
c) The visibility of the proposed power line to and visual impact on urban residential areas.

a) The visibility of the facility to and visual impact on rural homesteads.

Nature of impact:

Twenty three homesteads are in close proximity to the proposed development. Of these:

- Seven are workers accommodation some of which appear to be used on a temporary basis;
- Ten are farmsteads and are comprised of a mix of buildings including storage sheds, workers accommodation and farm houses; and
- Six are private houses which includes a lodge.

The majority of homesteads are sufficiently distant from the proposed power line and either have mature trees within and around the residential building / buildings or have existing natural vegetation that extends above eye level between the residential building / buildings that will largely screen the power line from view.

Homesteads that have greater potential to be affected include:

- Homestead H19 (farmstead) which is located approximately 510m from the proposed power line. There is a significant amount of mature vegetation around the homestead which is also located in a depression, however, there is an open view corridor to the south of the main house through which the proposed power line is likely to be visible. There is however an existing power line that is of similar scale to the proposed line that is approximately 400m from the main house and will be seen in front of the proposed power line.
- Homesteads H4, H5 and H7 (workers accommodation) are located approximately 380m, 780m and 1100m from the proposed power line respectively. Whilst there is some vegetation located between the homesteads and the proposed power line that will help to partially screen the development, it is likely that the proposed power line will be obvious particularly from the closest homestead.
- Homestead H16 (workers accommodation) is located approximately 123m from the proposed power line. Whilst this homestead was not visited, it appears that there is little vegetation that will provide screening. The proposed power line is likely to be obvious.

Whilst H19 which is a farmstead may be affected, views of the proposed power line are over a relatively small arc of vision and the view is already affected by a similar power line.

It is therefore seems that workers accommodation may be the dwelling type that is most affected visually. It is also seems likely that residents may not have major concern over the possible change of outlook.

	Without mitigation	**With mitigation**
Extent	Immediate surroundings, **(2)**	Immediate surroundings, **(2)**
Duration	Long Term, **(4)**	Long Term, **(4)**
Magnitude	Low, **(4)**	Minor to low,**(3)**
Probability	Highly probable, **(4)**	Probable,**(3)**
Significance	Medium, **(40)**	Low,**(27)**
Status	The character of the rural landscape around a small number of rural homesteads will be changed. It is likely that the some people will not consider the sight of an additional overhead power line in the context of existing linesas a negative intrusion. The closer that the power line is to a homestead however, the more likely that it will be considered as a negative intrusion. **Negative.**	**Negative**
Irreplaceable loss	**No irreplaceable loss**	**No irreplaceable loss**

Can impacts be mitigated?	**Yes *Mitigation / Management:***
• Retain and maintain natural vegetation in all areas outside of the development footprint/servitude. • Ensure that vegetation is not unnecessarily removed during the operation or maintenance period. • Restrict the activities and movement of workers and vehicles during maintenance and operation of the site and existing access roads. • Ensure that rubble, litter, and maintenance materials are removed once maintenance is complete and discarded at appropriately licensed waste facilities. • Rehabilitate all disturbed areas immediately after the completion of construction works. • Maintain the general natural appearance of the power line servitude as a whole • Rehabilitated areas must be monitored to prevent the infestation of alien vegetation species that may establish • Align power line as far from homesteads as possible within the identified corridor.	
Residual Risks: Lack of rehabilitation on decommissioning is likely to result in degraded areas.	

b) The visibility of the facility to and visual impact on the N14.

Nature of impact: Only the southernmost portion of the proposed power line will impact on the N14 as it will cross the road and run close and parallel with it for approximately 6-7km. As the N14 road crossing is in the vicinity of an existing 400KV power line road crossing, this element is unlikely to create significant additional impact.		
	Without mitigation	**With mitigation**
Extent	Immediate surroundings, **(2)**	Immediate surroundings, **(2)**
Duration	Long term, **(4)**	Long term, **(4)**
Magnitude	Moderate, **(6)**	Minor to low, **(3)**
Probability	Probable, **(3)**	Probable,**(3)**
Significance	Medium, **(36)**	Low, **(27)**
Status	The character of the rural landscape adjacent to the affected section of the N14 will be modified. It is likely that the majority of people will not consider the sight of an additional overhead power lineclose to the road as a negative intrusion. **Neutral to negative.**	**Neutral to negative**
Irreplaceable loss	**No irreplaceable loss**	**No irreplaceable loss**
Can impacts be mitigated?	**Yes**	
Mitigation / Management: • Align power line as far from the road as possible within the identified corridor; • Retain and maintain natural vegetation in all areas outside of the development footprint/servitude; • Ensure that vegetation is not unnecessarily removed during the operation or maintenance period;		

- Restrict the activities and movement of workers and vehicles during maintenance and operation of the site and existing access roads;
- Ensure that rubble, litter, and maintenance materials are removed once maintenance is complete and discarded at appropriately licensed waste facilities;
- Rehabilitate all disturbed areas immediately after the completion of construction works;
- Maintain the general natural appearance of the power line servitude as a whole; and
- Rehabilitated areas must be monitored to prevent the infestation of alien vegetation species that may establish.

Residual Risks:
Lack of rehabilitation on decommissioning is likely to result in degraded areas.

c) The visibility of the facility to and visual impact on urban residential areas.

Nature of impact:
Only the southernmost portion of the proposed power line may impact on urban areas.

The proposed power line is located some way from any residential property. There is significant existing vegetation between the power line and residential structures. The authorised substation is also located between the majority of residential structures on the eastern side of Olifantshoek and the proposed power line.

It is therefore unlikely that the proposed power line will have any significant visual impact on residential structures.

	Without mitigation	**With mitigation**
Extent	Immediate surroundings, **(2)**	Immediate surroundings, **(2)**
Duration	Long term, **(4)**	Long term, **(4)**
Magnitude	Small to Minor, **(1)**	Small, **(0)**
Probability	Improbable, **(2)**	Very improbable,**(1)**
Significance	Low, **(14)**	Low, **(6)**
Status	It is likely that the majority of people will consider the sight of electrical infrastructure in close proximity to a residential area as a negative impact. **Negative.**	**Neutral**
Irreplaceable loss	**No irreplaceable loss**	**No irreplaceable loss**
Can impacts be mitigated?	**Yes**	

Mitigation / Management:
- Ensure that vegetation is not unnecessarily removed during construction and the operation phase;
- Ensure that rubble, litter, and maintenance materials are removed once the construction / maintenance activities are complete and discarded at appropriately licensed waste facilities;
- Rehabilitate all disturbed areas immediately after the completion of construction / maintenance works;
- Maintain the general natural appearance of the power line servitude; and

• Rehabilitated areas must be monitored to prevent the infestation of alien vegetation species that may establish.
Residual Risks: Lack of rehabilitation on decommissioning is likely to result in degraded areas.

6.2.3 CUMULATIVE IMPACTS

a) General landscape change and degradation of natural landscape characteristics.

Nature of impact:
The affected natural landscape (Lowland and Upland LCAs) is not a highly natural area as it is already impacted by existing infrastructure including an existing400kV overhead power line, as well as several smaller power lines of similar scale to the proposed line.

The proposed 132kV overhead power line will add marginally to the local intensity of existing visual impacts of electrical infrastructure within the Lowland LCA. They will also extend the impact into the Upland LCA as the alignments run along the N14 towards Olifantshoek.

	Overall Cumulative Impact	**Contribution of the project**
Extent	Immediate surroundings, **(2)**	Immediate surroundings, **(2)**
Duration	Long term, **(4)**	Long term, **(4)**
Magnitude	Minor to low, **(3)**	Minor,**(2)**
Probability	Probable, **(3)**	Improbable, **(2)**
Significance	Low, **(27)**	Low,**(16)**
Status	Negative	**Neutral - negative**
Reversibility	High	High
Loss of Resources?	No	No
Confidence in findings	High	

2 THE VISIBILITY OF THE POWER LINE TO, AND POTENTIAL VISUAL IMPACT ON RURAL HOMESTEADS.

Nature of impact:
Three homesteads that are workers accommodation appear to have the potential to be affected visually. All are affected by existing small power lines.

It is also seems likely that residents may not have major concern over the possible change of outlook.

	Overall Cumulative Impact	**Contribution of the project**
Extent	Immediate surroundings, **(2)**	Immediate surroundings, **(2)**
Duration	Immediate surroundings, **(4)**	Long Term, **(4)**
Magnitude	Low, **(4)**	Minor to low,**(3)**

Probability	Probable, **(3)**	Probable,**(3)**
Significance	Medium, **(30)**	Low,**(27)**
Status	Negative	**Negative**
Reversibility	High	High
Loss of Resources?	No	No
Confidence in findings	High	

3 THE VISIBILITY OF THE POWER LINE TO, AND POTENTIAL VISUAL IMPACT ON THE N14.

Nature of impact:
Only the southernmost portion of the proposed power line will impact on the N14 as it will cross the road and run close to and parallel with it for approximately 6km. The power line will add to the extent of infrastructure including low voltage power lines that are visible in the landscape.

	Overall Cumulative Impact	**Contribution of the project**
Extent	Immediate surroundings, **(2)**	Immediate surroundings, **(2)**
Duration	Long term, **(4)**	Long term, **(4)**
Magnitude	Low, **(4)**	Minor to low, **(3)**
Probability	Probable, **(3)**	Probable,**(3)**
Significance	Medium, **(30)**	Low, **(27)**
Status	Negative	Neutral to negative
Confidence in findings	High	

4 THE VISIBILITY OF THE POWER LINE TO, AND POTENTIAL VISUAL IMPACT ON URBAN AREAS.

Nature of impact:
Only the southernmost portion of the proposed power line has the potential to impact on the urban area of Olifantshoek. This section is unlikely to create a significant additional visual impact.

Currently the Olifantshoek substation is located immediately adjacent to and impacts visually residential houses.

	Overall Cumulative Impact	**Contribution of the project**
Extent	Immediate surroundings, **(2)**	Immediate surroundings, **(2)**
Duration	Long term, **(4)**	Long term, **(4)**
Magnitude	Low, **(4)**	Small, **(0)**
Probability	Probable, **(3)**	Very improbable,**(1)**
Significance	Medium, **(30)**	Low, **(6)**

Status	Negative	Neutral
Reversibility	High	High
Loss of Resources?	No	No
Confidence in findings	High	

7 IMPACT STATEMENT

7.1 LANDSCAPE CHARACTER

The affected landscape can be divided into the Urban, Lowland and Upland LCAs. The latter two are both relatively natural.

Both the Lowland and Upland LCAs are covered by relatively open thorn veld which will provide some visual absorption capacity particularly from low levels.

The Upland LCA has significantly greater visual absorption capacity due to the relatively rugged terrain.

The proposed development corridor within the Lowland LCA is currently impacted by an existing 400kV overhead power line as well as numerous smaller power lines.

The urban LCA is also impacted by the existing Olifantshoek Substation which sits close to a residential area.

The proposed power line will connect to a new 10MVA 132/11KV substation that has been authorised. This substation will be located on the eastern side of Olifantshoek and close to the N14. It is anticipated that this facility will have minimal visual impact on existing residential areas due to distance and the extent ofnatural vegetation in the intervening area.

No protected areas are likely to be affected.

7.2 PROPOSED DEVELOPMENT

The proposed power line will be comprised of the following:

- A new overhead 132 kV power line approximately 36km long to connect directly to the Emil Switching Station (**Plate 1**) via an authorised substation on the eastern edge of Olifantshoek and close to the N14 that has recently been authorised (**Plate 2**); and
- The possible development corridor of the new power line is 300m with aservitude of 31m wide.

From the Emil Switching Station, the alignment roughly follows the eastern bank of an intermittent stream course (Ga Mogara) to a position approximately 9km south east of the switching station. From this point, the power line runs south-west for approximately 21km where it meets the Ferrum/Nieuwehoop 400kV line. At this point the alignment turns to the south, south, east to run parallel with the Ferrum/Nieuwehoop 400kV line for approximately 2km. The alignment crosses the N14 and immediately on the southern side of this road it turns to the east and runs parallel to the N14 for approximately 7km linking into the Olifantshoek substation at the end of this section.

7.3 IDENTIFIED SENSITIVE RECEIVERS

The following sensitive receivers have been identified;

- Area Receptors that include the urban area of Olifantshoek. From the site visit it is highly unlikely that the formal urban area will be affected, however, there are a number of informal dwellings close to the authorised substation location

on the eastern edge of Olifantshoek from which the proposed power line may be visible.

- Point Receptors that include homesteads that are scattered throughout the area. It is likely that the focus for this area is mainly agricultural production. However, from the site visit it is obvious that homesteads fall into the following categories:
    - Homesteads that are obviously just residential structures. These include game lodges and private homes. It is likely that these homesteads will have the greatest sensitivity to possible views of the proposed power line.
    - Homesteads that are incorporated into working farmsteads that might include a number of other buildings such as workshops, storage facilities and farm workers accommodation. It is likely that residents of these dwellings will be concerned about the productivity of the land and the safety of their livestock ahead of the nature of the outlook.
    - Homesteads that are stand-alone workers accommodation. These structures include facilities that are obviously associated with stock watering and handling some of which are probably used on a temporary basis during specific management operations. They also include structures that are permanently occupied. In terms of significance, it seems likely that occupants of these buildings are likely to be mainly focused on the job in hand. The surrounding landscape is likely to be a minor consideration.
- Linear Receptors that include the N14 and or local routes through the area. The N14 is a primary tourism route.

7.4 VISUAL IMPACT AND MITIGATION POTENTIAL

The assessment found that:

- With mitigation, the proposed power line will have a visual impact with a low significance on existing landscape character;
- Three homesteads comprised of workers accommodation are the most likely homesteads that will be negatively affected visually by the proposed power line. With mitigation however, this impact is anticipated to have a low significance;
- A 6-7km length of the N14 is the only section of this road that is likely to be visually affected. With mitigation however, this impact is anticipated to have a low significance;
- The eastern section of Olifantshoek is the only urban area that potentially could be affected. With mitigation however, this area is unlikely to be impacted.

7.5 CUMULATIVE IMPACT

Proposed overhead power lines will add additional infrastructure to corridors that are already impacted by an existing 400kV overhead power line as well as other minor overhead power lines.

This means that the contribution of the proposed project to overall cumulative visual impacts is low.

7.7 CONCLUSION

As long as the listed mitigation measures are incorporated, on visual grounds, there is no reason why the proposed project should not be authorised.

REFERENCES

Guidelines for involving visual and aesthetic specialists in EIA processes, Author; Bernard Oberhozer. Published by the Provincial Government of the Western Cape: Department of Environmental Affairs and Development Planning, 2005

Guidelines for landscape and visual impact assessment (third edition), authors; the Landscape Institute and Institute of Environmental Assessment and Management, published by E & FN Spon, 2013.

Manual of Environmental Appraisal, UK Department of Transport, 1992

Visual Impact Assessment Guidebook, Second Edition. Province of British Colombia. January 2001

APPENDIX I

SPECIALIST'S BRIEF CV

Name	JONATHAN MARSHALL
Nationality	British
Year of Birth	1956
Specialisation	Landscape Architecture / Landscape & Visual Impact Assessment / Environmental Planning / Environmental Impact Assessment.
Qualifications	
Education	Diploma in Landscape Architecture, Gloucestershire College of Art and Design, UK (1979) Environmental Law, University of KZN (1997)
Professional	Registered Professional Landscape Architect (SACLAP) Chartered Member of the Landscape Institute (UK) Member of the International Association of Impact Assessment, South Africa
Languages	English- Speaking - Excellent - Reading - Excellent - Writing - Excellent
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General

Jon qualified as a Landscape Architect (Dip LA) at Cheltenham (UK) in 1979. He has been a chartered member of the Landscape Institute UK since 1983. He is also a Registered Landscape Architect and has extensive experience of environmental impact assessment processes in South Africa (2009).

During the early part of his career (1981 - 1990) He worked with Clouston (now RPS) in Hong Kong and Australia. During this period he was called on to undertake visual impact assessment (VIA) input to numerous environmental assessment processes for major infrastructure projects. This work was generally based on photography with line drawing superimposed to illustrate the extent of development visible.

He has worked in the United Kingdom (1990 - 1995) for major supermarket chains including Sainsbury's and prepared CAD based visual impact assessments for public enquiries for new store development. He also prepared the VIA input to the environmental statement for the Cardiff Bay Barrage for consideration by the UK Parliament in the passing of the Barrage Act (1993).

His more recent VIA work (1995 to present) includes a combination of CAD and GIS based work for a new international airport to the north of Durban, new heavy industrial operations, overhead electrical transmission lines, mining operations in West Africa and numerous commercial and residential developments.

VIA work undertaken during the last eighteen months includes assessments for several proposed tourism developments in National Parks, numerous solar power projects, numerous telecommunications masts, a proposed coal fired power station as well as an amendment application for an authorised wind energy project.

Select List of Visual Impact Assessment Projects

- **Makapanstad Agri- Hub –** Landscape andVisual Impact Assessment for proposed Agri-Hub development at Makapanstad in the North West Province for the Department of Rural Development and Land Reform.
- **Madikwe Sky Bubble -** Landscape andVisual Impact Assessment for proposed development of up-market accommodation at the Molori concession within the Madikwe Game Reserve.
- **Hartebeest Wind Energy Facility** – Landscape andVisual Impact Assessment Addendum Report for the proposed upgrading of turbine specifications for an authorised WEF near Mo0rreesburg in the Western Cape Province for a private client.
- **Gunstfontein Wind Farm Amendment -** Landscape andVisual Impact Assessment for a proposed change in rotor size, hub height and layout of an authorised wind farm near Sutherland in the Northern Cape Province.
- **Selati Railway Bridge** - Landscape andVisual Impact Assessment for proposed development of up-market accommodation on a railway bridge at Skukuza in the Kruger Park.
- **Kangala Mine Extension -** Landscape andVisual Impact Assessment for a proposed extension to the Kangala Mine in Mpumalanga for Universal Coal.
- **Khunab Solar Developments** – Landscape andVisual Impact Assessment for four proposed solar PV projects near Upington in the Northern Cape Province for a private client.
- **Sirius Solar Developments** – Landscape andVisual Impact Assessment for four proposed solar PV projects near Upington in the Northern Cape Province for Sola Future Energy.
- **Aggeneys Solar Developments** – Landscape andVisual Impact Assessment for two proposed solar PV projects near Aggeneys in the Northern Cape Province for a private client.
- **Hyperion Solar Developments** – Landscape andVisual Impact Assessment for four proposed solar PV projects near Kathu in the Northern Cape Province for Building Energy South Africa.
- **Eskom Combined Cycle Power Plant** - Landscape andVisual Impact Assessment for proposed gas power plant in Richards Bay, KwaZulu Natal Province.
- **N2 Wild Coast Toll Road, Mineral Sources and Auxiliary Roads –** VIA for the Pondoland Section of this project for the South African National Roads Agency.
- **Mpushini Park Ashburton –** VIA for a proposed amendment to an authorised development plan which included residential, office park and light industrial uses to logistics and warehousing.
- **Moedeng PV Solar Project -** VIA for a solar project near Vrybury in the North West Province for a private client.
- **Great Karoo Wind Farm Amendment -** Landscape andVisual Impact Assessment for a proposed change in rotor size, hub height and layout of an authorised wind farm near Sutherland in the Northern Cape Province.
- **Establishment of Upmarket Tourism Accommodation on the Selati Bridge, Kruger National Park** – Assessment of visual implications of providing tourism accommodation in 12 railway carriages on an existing railway bridge at the Skukuza Rest Camp in the Kruger Park.
- **Jozini TX Transmission Tower** – Assessment of visual implications of a proposed MTN transmission tower on the Lebombo ridgeline overlooking the Pongolapoort Nature reserve and dam.
- **Bhangazi Lake Development** – Visual Impact Assessment for a proposed tourism development within the iSimangalisoWetlend Park World Heritage Site.
- **Palesa Power Station** - VIA for a new 600MW power station near Kwamhlanga in Mpumalanga for a private client.
- **Heuningklip PV Solar Project** – VIA for a solar project in the Western Cape Province for a private client.
- **Kruispad PV Solar Project** – VIA for a solar project in the Western Cape Province for a private client.

- **Doornfontein PV Solar Project** – VIA for a solar project in the Western Cape Province for a private client.
- **Olifantshoek Power Line and Substation** – VIA for a new 10MVA 132/11kV substation and 31km powerline, Northern Cape Province, for Eskom.
- **NoupoortConcentrating Solar Plants -** Scoping and Visual Impact Assessments for two proposed parabolic trough projects.
- **Drakensberg Cable Car –** Preliminary Visual Impact Assessment and draft terms of reference as part of the feasibility study.
- **Paulputs Concentrating Solar Plant (tower technology)** – Visual Impact Assessment for a new CSP project near Pofadder in the Northern Cape.
- **Ilanga Concentrating Solar Plants 1, 2, 3, 4 & 5** – Scoping and Visual Impact Assessments for the proposed extension of five authorised CSP projects including parabolic trough and tower technology within the Karoshoek Solar Valley near Upington in the Northern Cape.
- **Ilanga Concentrating Solar Plants 1, 2, 3, 4 & 5 Shared Infrastructure** –Visual Impact Assessment for the necessary shared infrastructure including power lines, substation, water pipeline and roads for these projects.
- **Ilanga Concentrating Solar Plants 7, 8 & 9** - Scoping and Visual Impact Assessments for three new CSP projects including parabolic trough and tower technology within the Karoshoek Solar Valley near Upington in the Northern Cape.
- **Sol Invictus Solar Plants** - Scoping and Visual Impact Assessments for three new Solar PV projects near Pofadder in the Northern Cape.
- **Gunstfontein Wind Energy Facility**– Scoping and Visual Impact Assessment for a proposed WEF near Sutherland in the Northern Cape.
- **Moorreeesburg Wind Energy Facility**– Visual Impact Assessment for a proposed WEF near Moorreeesburg in the Western Cape.
- **Semonkong Wind Energy Facility** - Visual Impact Assessment for a proposed WEF near Semonkong in Southern Lesotho.
- **Great Karoo Wind Energy Facility** – Addendum report to the Visual Impact Assessment Report for amendment to this authorised WEF that is located near Sutherland in the Northern Cape. Proposed amendments included layout as well as rotor diameter.
- **Perdekraal East Power Line** – Visual Impact Assessment for a proposed power line to evacuate power from a wind energy facility near Sutherland in the Northern Cape.
- **Tshivhaso Power Station** – Scoping and Visual Impact Assessment for a proposed new power station near Lephalale in Limpopo Province.
- **Saldanha Eskom Strengthening** – Scoping and Visual Impact Assessment for the upgrading of strategic Eskom infrastructure near Saldanha in the Western Cape.
- **Eskom Lethabo PV Installation** - Scoping and Visual Impact Assessment for the development of a solar PV plant within Eskom's Lethabo Power Station in the Free State.
- **Eskom Tuthuka PV Installation** - Scoping and Visual Impact Assessment for the development of a solar PV plant within Eskom's Thutuka Power Station in Mpumalanga.
- **Eskom Majuba PV Installation** - Scoping and Visual Impact Assessment for the development of a solar PV plant within Eskom's Majuba Power Station in Mpumalanga.
- **Golden Valley Power Line** - Visual Impact Assessment for a proposed power line to evacuate power from a wind energy facility near Cookhouse in the Eastern Cape.
- **Mpophomeni Shopping Centre** – Visual impact assessment for a proposed new shopping centre close to the southern shore of Midmar Dam in KwaZulu Natal.
- **Rheeboksfontein Power Line** - Addendum report to the Visual Impact Assessment Report for amendment to this authorised power line alignment located near Darling in the Western Cape.
- **Woodhouse Solar Plants** – Scoping and Visual Impact Assessment for two proposed solar PV projects near Vryburg in the North West Province.

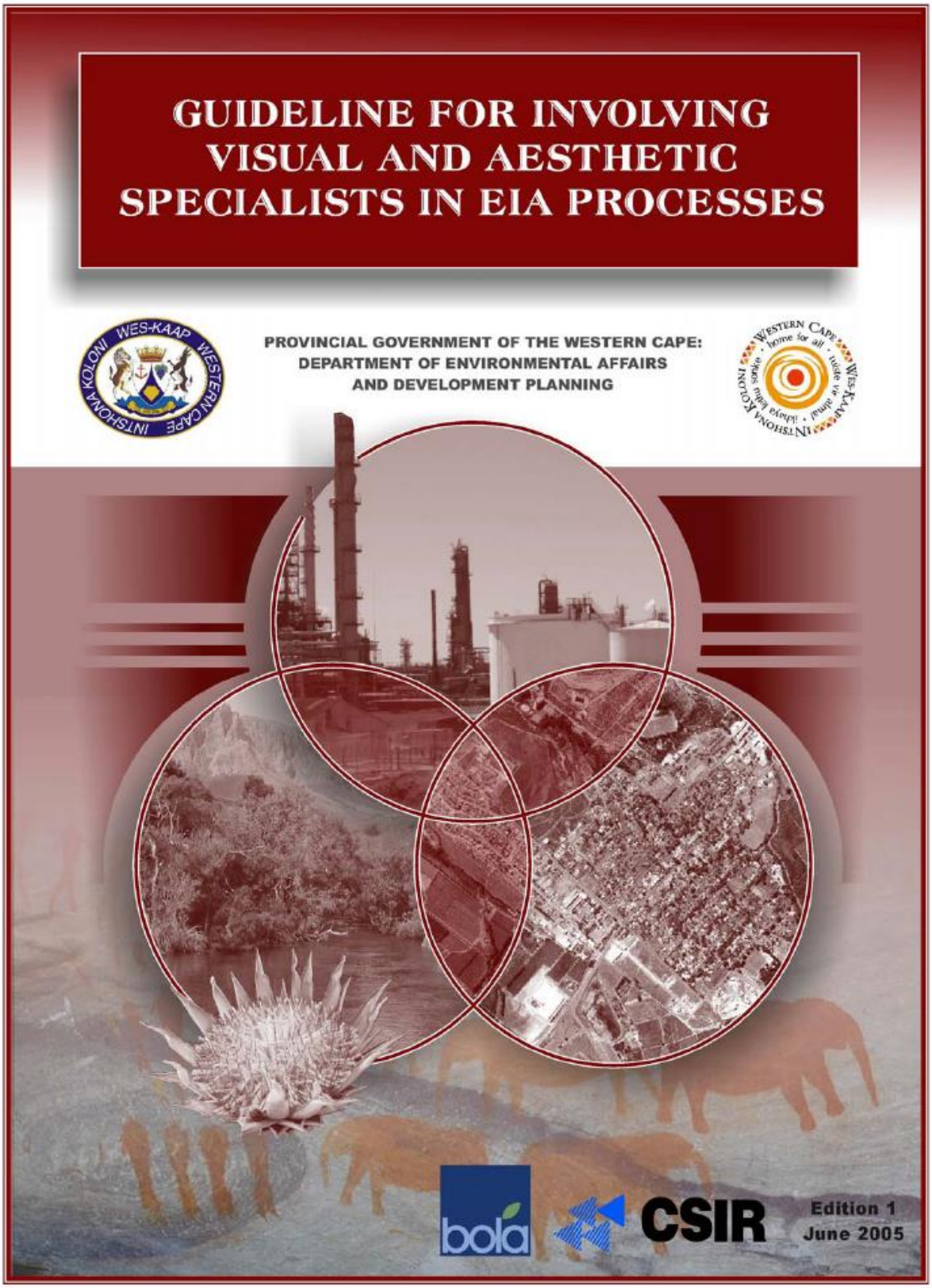
- **AngloGold Ashanti, Dokyiwa (Ghana)** – Visual Impact Assessment for proposed new Tailings Storage Facility at a mine site working with SGS as part of their EIA team.
- **Gateway Shopping Centre Extension (Durban)** – Visual Impact Assessment for a proposed shopping centre extension in Umhlanga, Durban.
- **Kouroussa Gold Mine (Guinea)** – Visual impact assessment for a proposed new mine in Guinea working with SGS as part of their EIA team.
- **Mampon Gold Mine (Ghana)** - Visual impact assessment for a proposed new mine in Ghana working with SGS as part of their EIA team.
- **Telkom Towers** – Visual impact assessments for numerous Telkom masts in KwaZulu Natal.
- **Eskom Isundu Substation** – Visual Impact Assessment for a proposed major new Eskom substation near Pietermaritzburg in KwaZulu Natal.
- **Eskom St Faiths Power Line and Substation** – Visual Impact Assessment for a major new substation and associated power lines near Port Shepstone in KwaZulu Natal.
- **Eskom Ficksburg Power Line** – Visual Impact Assessment for a proposed new power line between Ficksburg and Cocolan in the Free State.
- **Eskom Matubatuba to St Lucia Power Line** – Visual Impact Assessment for a proposed new power line between Mtubatuba and St Lucia in KwaZulu Natal.
- **Dube Trade Port, Durban International Airport** – Visual Impact Assessment
- **Sibaya Precinct Plan** – Visual Impact Assessment as part of Environmental Impact Assessment for a major new development area to the north of Durban.
- **Umdloti Housing** – Visual Impact Assessment as part of Environmental Impact Assessment for a residential development beside the Umdloti Lagoon to the north of Durban.
- **Tata Steel Ferrochrome Smelter** - Visual impact assessment of proposed new Ferrochrome Smelter in Richards Bay as part of EIA undertaken by the CSIR.
- **Durban Solid Waste Large Landfill Sites –** Visual Impact Assessment of proposed development sites to the North and South of the Durban Metropolitan Area. The project utilised 3d computer visualisation techniques.
- **Hillside Aluminium Smelter, Richards Bay -** Visual Impact Assessment of proposed extension of the existing smelter. The project utilised 3d computer visualisation techniques.
- **Estuaries of KwaZulu Natal Phase 1 –** Visual character assessment and GIS mapping as part of a review of the condition and development capacity of eight estuary landscapes for the Town and Regional Planning Commission. The project was extended to include all estuaries in KwaZulu Natal.
- **Signage Assessments** – Numerous impact assessments for proposed signage developments for Blast Media.
- **Signage Strategy** – Preparation of an environmental strategy report for a national advertising campaign on National Roads for Visual Image Placements.
- **Zeekoegatt, Durban** - Computer aided visual impact assessment. EDP acted as advisor to the Province of KwaZulu Natal in an appeal brought about by a developer to extend a light industrial development within a 60 metre building line from the National N3 Highway.
- **La Lucia Mall Extension** - Visual impact assessment using three dimensional computer modelling / photo realistic rendering and montage techniques for proposed extension to shopping mall for public consultation exercise.
- **Redhill Industrial Development** - Visual impact assessment using three dimensional computer modelling / photo realistic rendering and montage techniques for proposed new industrial area for public consultation exercise.
- **Avondale Reservoir** - Visual impact assessment using three dimensional computer modelling / photo realistic rendering and montage techniques for proposed hilltop reservoir as part of Environmental Impact Assessment for Umgeni Water.

- **Hammersdale Reservoir** - Visual impact assessment using three dimensional computer modelling / photo realistic rendering and montage techniques for proposed hilltop reservoir as part of Environmental Impact Assessment for Umgeni Water.
- **Southgate Industrial Park, Durban** - Computer Aided Visual Impact Assessment and Landscape Design for AECI.
- **Sainsbury's Bryn Rhos** - Computer Aided Visual Impact Assessment/ Planning Application for the development of a new store within the Green Wedge North of Swansea.
- **Ynyston Farm Access** - Computer Aided Impact Assessment of visual intrusion of access road to proposed development of Cardiff for the Land Authority for Wales.
- **Cardiff Bay Barrage** – Preparation of the Visual Impact Statement for inclusion in the Impact Statement for debate by parliament (UK) prior to the passing of the Cardiff Bay Barrage Bill.
- **A470, CefnCoed to Pentrebach** - Preparation of landscape frameworks for the assessment of the impact of the proposed alignment on the landscape for The Welsh Office.
- **Sparkford to Illchester Bye Pass** - The preparation of the landscape framework and the draft landscape plan for the Department of Transport.
- **Green Island Reclamation Study** - Visual Impact Assessment of building massing, Urban Design Guidelines and Masterplanning for a New Town extension to Hong Kong Island.
- **Route 3** - Visual Impact Assessment for alternative road alignments between Hong Kong Island and the Chinese Border.
- **China Border Link** - Visual Impact Assessment and initial Landscape Design for a new border crossing at Lok Ma Chau.
- **Route 81, Aberdeen Tunnel to Stanley** - Visual Impact Assessment for alternative highway alignments on the South side of Hong Kong Island.

APPENDIX II

GUIDELINES FOR INVOLVING VISUAL AND AESTHETIC SPECIALISTS IN EIA PROCESSES

(Preface, Summary and Contents for full document go to the Provincial Government of the Western Cape, Department of Environmental Affairs and Development Planning web site, http://eadp.westerncape.gov.za/your-resource-library/policies-guidelines)


GUIDELINE FOR INVOLVING VISUAL AND AESTHETIC SPECIALISTS IN EIA PROCESSES
PROVINCIAL GOVERNMENT OF THE WESTERN CAPE:
DEPARTMENT OF ENVIRONMENTAL AFFAIRS
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GUIDELINE FOR INVOLVING VISUAL AND AESTHETIC SPECIALISTS IN EIA PROCESSES

Edition 1

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Stakeholders engaged in the guideline development process:

These guidelines were developed through a consultative process and have benefited from the inputs and comments provided by a wide range of individuals and organizations actively working to improve EIA practice. Thanks are due to all who took the time to engage in the guideline development process.

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Finalisation of report figures and formatting:

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PREFACE

The purpose of an Environmental Impact Assessment (EIA) is to provide decision-makers (be they government authorities, the project proponent or financial institutions) with adequate and appropriate information about the potential positive and negative impacts of a proposed development and associated management actions in order to make an informed decision whether or not to approve, proceed with or finance the development.

For EIA processes to retain their role and usefulness in supporting decision-making, the involvement of specialists in EIA needs to be improved in order to:

- Add greater value to project planning and design;
- Adequately evaluate reasonable alternatives;
- Accurately predict and assess potential project benefits and negative impacts;
- Provide practical recommendations for avoiding or adequately managing negative impacts and enhancing benefits;
- Supply enough relevant information at the most appropriate stage of the EIA process to address adequately the key issues and concerns, and effectively inform decision-making in support of sustainable development.

It is important to note that not all EIA processes require specialist input; broadly speaking, specialist involvement is needed when the environment could be significantly affected by the proposed activity, where that environment is valued by or important to society, and/or where there is insufficient information to determine whether or not unavoidable impacts would be significant.

The purpose of this series of guidelines is to improve the efficiency, effectiveness and quality of specialist involvement in EIA processes. The guidelines aim to improve the capacity of roleplayers to anticipate, request, plan, review and discuss specialist involvement in EIA processes. Specifically, they aim to improve the capacity of EIA practitioners to draft appropriate terms of reference for specialist input and assist all roleplayers in evaluating whether or not specialist input to the EIA process is appropriate for the type of development and environmental context. Furthermore, they aim to ensure that specialist inputs support the development of effective, practical Environmental Management Plans where projects are authorised to proceed (refer to *Guideline for Environmental Management Plans*).

The guidelines draw on best practice in EIA in general, and within specialist fields of expertise in particular, to address the following issues related to the timing, scope and quality of specialist input. The terms "specialist involvement" and "input" have been used in preference to "specialist assessment" and "studies" to indicate that the scope of specialists' contribution (if required) depends on the nature of the project, the environmental context and the amount of available information and does not always entail detailed studies or assessment of impacts.

The guidelines draw on best practice in EIA in general, and within specialist fields of expertise in particular, to address the following issues related to the timing, scope and quality of specialist input. The terms "specialist involvement" and "input" have been used in preference to "specialist

assessment" and "studies" to indicate that the scope of specialists' contribution depends on the nature of the project, the environmental context and the amount of available information.

	ISSUES
TIMING	▪ When should specialists be involved in the EIA process; i.e. at what stage in the EIA process should specialists be involved (if at all) and what triggers the need for their input?
SCOPE	▪ Which aspects must be addressed through specialist involvement; i.e. what is the purpose and scope of specialist involvement? ▪ What are appropriate approaches that specialists can employ? ▪ What qualifications, skills and experience are required?
QUALITY	▪ What triggers the review of specialist studies by different roleplayers? ▪ What are the review criteria against which specialist inputs can be evaluated to ensure that they meet minimum requirements, are reasonable, objective and professionally sound?

The following guidelines form part of this first series of guidelines for involving specialists in EIA processes:

- Guideline for determining the scope of specialist involvement in EIA processes
- Guideline for the review of specialist input in EIA processes
- Guideline for involving biodiversity specialists in EIA processes
- Guideline for involving hydrogeologists in EIA processes
- Guideline for involving visual and aesthetic specialists in EIA processes
- Guideline for involving heritage specialists in EIA processes
- Guideline for involving economists in EIA processes

The *Guideline for determining the scope of specialist involvement in EIA processes* and the *Guideline for the review of specialist input in EIA processes* provide generic guidance applicable to any specialist input to the EIA process and clarify the roles and responsibilities of the different roleplayers involved in the scoping and review of specialist input. It is recommended that these two guidelines are read first to introduce the generic concepts underpinning the guidelines which are focused on specific specialist disciplines.

Who is the target audience for these guidelines?

The guidelines are directed at authorities, EIA practitioners, specialists, proponents, financial institutions and other interested and affected parties involved in EIA processes. Although the guidelines have been developed with specific reference to the Western Cape province of South Africa, their core elements are more widely applicable.

What type of environmental assessment processes and developments are these guidelines applicable to?

The guidelines have been developed to support project-level EIA processes regardless of whether they are used during the early project planning phase to inform planning and design decisions (i.e. during pre-application planning) or as part of a legally defined EIA process to obtain statutory approval for a proposed project (i.e. during screening, scoping and/or impact assessment). Where specialist input may be required the guidelines promote early, focused and appropriate involvement of specialists in EIA processes in order to encourage proactive consideration of potentially significant impacts, so that negative impacts may be avoided or

effectively managed and benefits enhanced through due consideration of alternatives and changes to the project.

The guidelines aim to be applicable to a range of types and scales of development, as well as different biophysical, social, economic and governance contexts.

What will these guidelines not do?

In order to retain their relevance in the context of changing legislation, the guidelines promote the principles of EIA best practice without being tied to specific legislated national or provincial EIA terms and requirements. They therefore do not clarify the specific administrative, procedural or reporting requirements and timeframes for applications to obtain statutory approval. They should, therefore, be read in conjunction with the applicable legislation, regulations and procedural guidelines to ensure that mandatory requirements are met.

It is widely recognized that no amount of theoretical information on how best to plan and coordinate specialist inputs, or to provide or review specialist input, can replace the value of practical experience of coordinating, being responsible for and/or reviewing specialist inputs. Only such experience can develop sound judgment on such issues as the level of detail needed or expected from specialists to inform decision-makers adequately. For this reason, the guidelines should not be viewed as prescriptive and inflexible documents. Their intention is to provide best practice guidance to improve the quality of specialist input.

Furthermore, the guidelines do not intend to create experts out of non-specialists. Although the guidelines outline broad approaches that are available to the specialist discipline (e.g. field survey, desktop review, consultation, modeling), specific methods (e.g. the type of model or sampling technique to be used) cannot be prescribed. The guidelines should therefore not be used indiscriminately without due consideration of the particular context and circumstances within which an EIA is undertaken, as this influences both the approach and the methods available and used by specialists.

How are these guidelines structured?

The specialist guidelines have been structured to make them user-friendly. They are divided into six parts, as follows:

- **Part A**: Background;
- **Part B**: Triggers and key issues potentially requiring specialist input;
- **Part C**: Planning and coordination of specialist inputs (drawing up terms of reference);
- **Part D**: Providing specialist input;
- **Part E**: Review of specialist input; and
- **Part F**: References.

Part A provides grounding in the specialist subject matter for all users. It is expected that authorities and peer reviewers will make most use of Parts B and E; EIA practitioners and project proponents Parts B, C and E; specialists Part C and D; and other stakeholders Parts B, D and E. Part F gives useful sources of information for those who wish to explore the specialist topic.

SUMMARY

This guideline document, which deals with specialist visual input into the EIA process, is organised into a sequence of interleading sections. These follow a logical order covering the following:

- the background and context for specialist visual input;
- the triggers and issues that determine the need for visual input;
- the type of skills and scope of visual inputs required in the EIA process;
- the methodology, along with information and steps required for visual input;
- finally, the review or evaluation of the visual assessment process.

Part A is concerned with defining the visual and aesthetic component of the environment, and with principles and concepts relating to the visual assessment process. The importance of the process being logical, holistic, transparent and consistent is stressed in order for the input to be useful and credible.

The legal and planning context within which visual assessments take place indicate that there are already a number of laws and bylaws that protect visual and scenic resources. These resources within the Western Cape context have importance for the economy of the region, along with the proclaimed World Heritage Sites in the Province.

The role and timing of specialist visual inputs into the EIA process are outlined, with the emphasis being on timely, and on appropriate level of input, from the early planning stage of a project, through to detailed mitigation measures and management controls at the implementation stage.

Part B deals with typical factors that trigger the need for specialist visual input to a particular project. These factors typically relate to:

(a) the nature of the receiving environment, in particular its visual sensitivity or protection status;
(b) the nature of the project, in particular the scale or intensity of the project, which would result in change to the landscape or townscape.

The correlation between these two aspects are shown in a table, in order to determine the varying levels of visual impact that can be expected, i.e. from little or no impact, to very high visual impact potential.

Part C deals with the choice of an appropriate visual specialist, and the preparation of the terms of reference (TOR) for the visual input. Three types of visual assessment are put forward, each requiring different expertise, namely:

Type A: assessments involving large areas of natural or rural landscape;
Type B: assessments involving local areas of mainly built environment;
Type C: assessments involving smaller scale sites with buildings, or groups of buildings.

The scope of the visual input would in summary relate to the following:

- the issues raised during the scoping process;
- the time and space boundaries, i.e. the extent or zone of visual influence;

- the types of development alternatives that are to be considered;
- the variables and scenarios that could affect the visual assessment;
- the inclusion of direct, indirect and cumulative effects.

Approaches to the visual input relate to the level of potential impact and range from minimal specialist input, to a full visual impact assessment (VIA). A list of the typical components of a visual assessment is given, and the integration with other studies forming part of the EIA process is discussed.

Part D provides guidance for specialist visual input, and on the information required by specialists. Notes on predicting potential visual impacts are given, along with suggested criteria for describing and rating visual impacts. The assessment of the overall significance of impacts, as well as thresholds of significance are discussed.

Further aspects that need to be considered by visual specialists in EIA processes include:

- affected parties who stand to benefit or lose,
- risks and uncertainties related to the project,
- assumptions that have been made, and their justification,
- levels of confidence in providing the visual input or assessment,
- management actions that can be employed to avoid or mitigate adverse effects and enhance benefits, and
- the best practicable environental option from the perspective of the visual issues and impacts.

Finally, pointers for the effective communication of the findings are given.

Part E lists specific evaluation criteria for reviewing visual input by a specialist, where this becomes necessary. Further guidance on this is given in the document on *Guideline for the review of specialist input in EIA processes.*

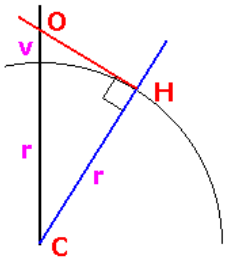
CONTENTS

APPENDIX III

FORMULA FOR DERIVING THE APPROXIMATE VISUAL HORIZON

The Mathematics behind this Calculation

This calculation should be taken as a guide only as it assumes the earth is a perfect ball 6378137 metres radius. It also assumes the horizon you are looking at is at sea level. A triangle is formed with the centre of the earth (C) as one point, the horizon point (H) is a right angle and the observer (O) the third corner. Using Pythagoras's theorem we can calculate the distance from the observer to the horizon (OH) knowing CH is the earth's radius (r) and CO is the earth's radius (r) plus observer's height (v) above sea level.



Sitting in a hotel room 10m above sea level a boat on the horizon will be 11.3km away. The reverse is also true, whilst rowing across the Atlantic, the very top of a mountain range 400m high could be seen on your horizon at a distance of 71.4 km assuming the air was clear enough.

APPENDIX V

ENVIRONMENTAL MANAGEMENT PLAN

Project component/s	Olifantshoek36km 132kV Power Line Construction, Operation and Decommissioning
Potential Impact	Change in Landscape Character Visual impact affecting rural homesteads Visual impact affecting travellers on the N14 Visual impact affecting residents of Olifantshoek
Activity/risk source	Vegetation clearance and rehabilitation during construction and decommissioning opening up views of the proposed power line to homesteads, the N14 and urban residents. Lack of screening and management of vegetation opening up views of both substation alternatives to local community. Decommissioning activities.
Mitigation: Target/Objective	Minimise and reinstate vegetation loss. Remove structures and rehabilitate site on decommissioning.

Mitigation: Action/control	**Responsibility** Contractor (C) Environmental Control Officer (ECO) Environmental Liaison Officer (ELO)	**Timeframe** Construction Phase (C) Operational Phase (O) Decommissioning Phase (D)
Minimise disturbance and maintain existing vegetation as far as is possible both within and surrounding the development area.	C, ECO, ELO	C
Reinstate any areas of vegetation that is disturbed during construction.	C, ECO, ELO	C
Rehabilitate areas to their natural state on decommissioning.	C, ECO, ELO	C, D
Monitor rehabilitated areas post-construction and post-decommissioning and implement remedial actions.	C, ECO, ELO	C, D
Remove all temporary works.	C, ECO, ELO	C
Remove infrastructure not required for the post-decommissioning use of the	C, ECO, ELO	D

site.			
Performance Indicators	Vegetation presence and density. Presence of unnecessary infrastructure.		
Monitoring	Evaluate vegetation before, during and after construction. Evaluate vegetation growth associated with screen planting and reinstatement during operations and for a year after decommissioning. Responsibility: ECO and ELO. Prepare regular reports.		