BOTANICAL ASSESSMENT FOR THE PROPOSED ESKOM 132 KV POWERLINE FROM WITZENBERG SUBSTATION TO CERES SUBSTATION AND NEW SUBSTATION AT PRINCE ALFRED HAMLET, WITZENBERG MUNICIPALITY, WESTERN CAPE

CAPENSIS

PAUL EMMS

DECEMBER 2020
UPDATED FEBRUARY 2024

REPORT PREPARED FOR

SRK CONSULTING

THE SPECIALIST

I, Paul Ivor Emms, as the appointed specialist hereby declare/affirm the correctness of the information provided or to be provided as part of the application, and that I:

- in terms of the general requirement to be independent:
    - other than fair remuneration for work performed/to be performed in terms of this application, have no business, financial, personal or other interest in the activity or application and that there are no circumstances that may compromise my objectivity; or
- in terms of the remainder of the general requirements for a specialist, am fully aware of and meet all of the requirements and that failure to comply with any the requirements may result in disqualification;
- have disclosed/will disclose, to the applicant all material information that have or may have the potential to influence the decision of the Department or the objectivity of any report, plan or document prepared or to be prepared as part of the application;
- have ensured/will ensure that information containing all relevant facts in respect of the application was/will be distributed or was/will be made available to interested and affected parties and the public and that participation by interested and affected parties was/will be facilitated in such a manner that all interested and affected parties were/will be provided with a reasonable opportunity to participate and to provide comments;
- have ensured/will ensure that the comments of all interested and affected parties were/will be considered, recorded and submitted to the Department in respect of the application;
- have ensured/will ensure the inclusion of inputs and recommendations from the specialist reports in respect of the application, where relevant;
- have kept/will keep a register of all interested and affected parties that participate/d in the public participation process; and
- am aware that a false declaration is an offence in terms of regulation 48 of the 2014 NEMA EIA Regulations.

Note: The terms of reference of the review specialist must be attached.

Signature of the specialist: 

Date: 22 February 2024

NATIONAL LEGISLATION AND REGULATIONS GOVERNING THIS REPORT

This is a 'specialist report' and is compiled in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended, and the Environmental Impact Assessment Regulations, 2014, as amended.

APPOINTMENT OF SPECIALIST

Capensis Ecological Consulting (Pty) Ltd (Capensis) was appointed by SRK Consulting South Africa (Pty) Ltd to provide specialist botanical consulting services for the construction of the Eskom 132kV Powerline from Witzenberg Substation to Ceres Substation, Witzenberg Municipality.

CONDITIONS RELATING TO THIS REPORT

The content of this report is based on the authors best scientific and professional knowledge as well as available information. Capensis Ecological Consulting (Pty) Ltd reserves the right to modify the report in any way deemed fit should new, relevant or previously unavailable or undisclosed information become known to the author from on-going research or further work in this field, or pertaining to this investigation.

This report must not be altered or added to without the prior written consent of the authors. This also refers to electronic copies of the report which are supplied for the purposes of inclusion as part of other reports, including main reports. Similarly, any recommendations, statements or conclusions drawn from or based on this report must make reference to this report. If these form part of a main report relating to this investigation or report, this report must be included in its entirety as an appendix or separate section to the main report.

DETAILS OF THE SPECIALIST

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Expertise

- Qualifications: ND Horticulture, BSc. (Biodiversity & Conservation Biology), Hons. (Botany), MSc (Botany).
- Botanist with seven 10 years' experience in the field of botanical surveys.
- Has conducted over 300 specialist botanical studies.

CONTENTS

1. INTRODUCTION

Eskom Holdings SOC (Ltd) Western Cape Operating Unit (Eskom) currently supply electricity to customers via a network linked between the Romansrivier substation and the Witzenberg substation. The existing electricity supply consists of a single circuit line from Romansrivier only. The supply line is fragile in the sense that any line breaks would result in over 3000 customers being without electricity for several months should a major fault occur. To address the fragility of the network and increase electrical supply to the region, Eskom is undertaking to construct a new single circuit powerline (132kV) in two phases from the Romansrivier substation to the Witzenberg substation. The first phase includes the Romansrivier substation to Ceres substation, which has already been completed. The second phase, which is the focus of this study, is the section from the Ceres Substation to the Witzenberg substation, via a new substation in Prince Alfred Hamlet.

Key aspects of the project include:

- Construction of a single circuit line (132kV) from Ceres to Witzenberg substation (~17km); and
- Construction of the new Prince Alfred Hamlet substation; and
- Construction of a new tie-in to the proposed Prince Alfred Hamlet substation from the propose new 132 kV line.

The extent of the study area comprises a 100 m corridor spanning the full length of the proposed (currently preferred) powerline route (~17 km), i.e. 50 m each side of the currently proposed route (the site). Eskom confirmed that no additional access roads would be constructed, rather existing roads will be utilised and the use of a helicopter is proposed for accessing structures 67 to 88.

Eskom has appointed SRK Consulting (South Africa) (Pty) Ltd (SRK) to undertake a Basic Assessment (BA) process as required in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended, and the EIA Regulations, 2014. A key component in the Environmental Authorization (EA) process is to provide baseline information and impact assessment regarding the affected vegetation within the project area. An initial baseline and screening study was undertaken in 2017. In the screening phase, sensitivity areas were flagged during a walk-down micro-citing exercise. Capensis Ecological Consulting Pty (Ltd) (Capensis)

was appointed by SRK to carry out the botanical investigation and impact assessment for phase two.

2. TERMS OF REFERENCE

2.1. GENERAL

Botanical assessments must follow guidelines set out in the following documents:

- Department of Environmental Affairs and Development Planning (DEA&DP) Guidelines for Involving Biodiversity Specialists in the EIA Process (Brownlie, 2005);
- Ecosystem Guidelines for Environmental Assessment in the Western Cape (Cadman *et al*., 2016);
- The requirements of CapeNature for providing comments on agricultural, environmental, mine planning and water-use related applications (Turner, 2013); and
- Procedures for the assessment and minimum criteria for reporting on Identified Environmental Themes in terms of Sections 24(5)(a) and 44 of the National Environmental Management Act (Government Gazette, 2020).

2.2. SPECIFIC

The specific terms of reference followed for this assessment are as follows:

- Describe the existing baseline characteristics of the study area and place this in a regional context. Include a description of biodiversity patterns at a community and ecosystem level (main vegetation type, plant communities in the vicinity and threatened/vulnerable ecosystems), at species level (threatened Red List species, protected species, presence of alien species) and in terms of significant landscape features;
- Describe the sensitivity of the site and its environs; and map these resources;
- Identify and assess potential impacts of the project and the alternatives, including impacts associated with the construction and operation phases, using SRK's prescribed impact rating methodology (Appendix 1);
- Identify and describe potential cumulative impacts of the proposed development in relation to proposed and existing developments in the surrounding area;
- Recommend mitigation measures to avoid and/or minimise impacts and/or optimise

benefits associated with the proposed project; and

- Recommend and draft a monitoring campaign, if applicable.

3. PROTOCOL FOR DETERMINING LEVEL OF REPORTING

The sensitivity of the site was predetermined using the Department of Forestry, Fisheries and the Environment (DFFE) screening tool (https://screening.environment.gov.za/screeningtool/). The entire area traversed by the proposed powerline is rated as Very High for terrestrial biodiversity sensitivity (Figure 1A). This level of sensitivity, if verified, requires a Terrestrial Biodiversity Impact Assessment to be submitted as part of the application for Environmental Authorisation (EA). The Plant sensitivity is rated as Very High, Medium and Low (Figure 1B). A Plant Species Assessment is required if either Very High or Medium sensitivity is verified. This botanical impact assessment forms part of this input as required in the Protocol for the assessment and reporting of environmental impacts on terrestrial biodiversity (Government Gazette 2020) whereas the Plant Species Sensitivity Report is provided in Appendix 3 as required in the Protocol for the assessment and reporting on plant species (Government Gazette 2022 & 2023).

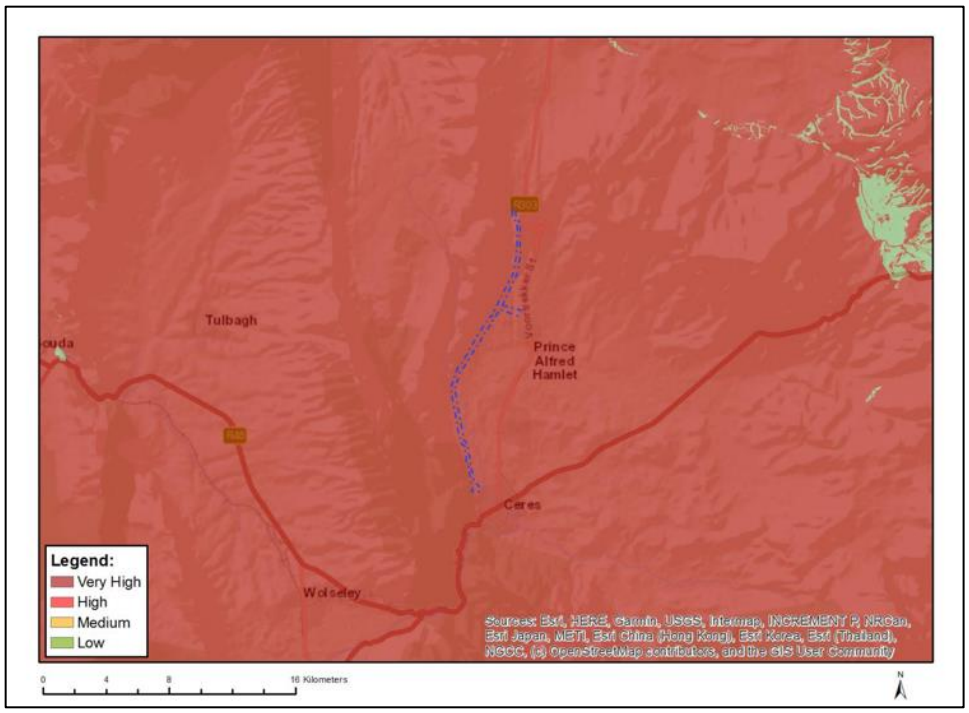


Figure 1A. Map of relative terrestrial biodiversity theme sensitivity generated from the DFFE Screening Tool (https://screening.environment.gov.za).

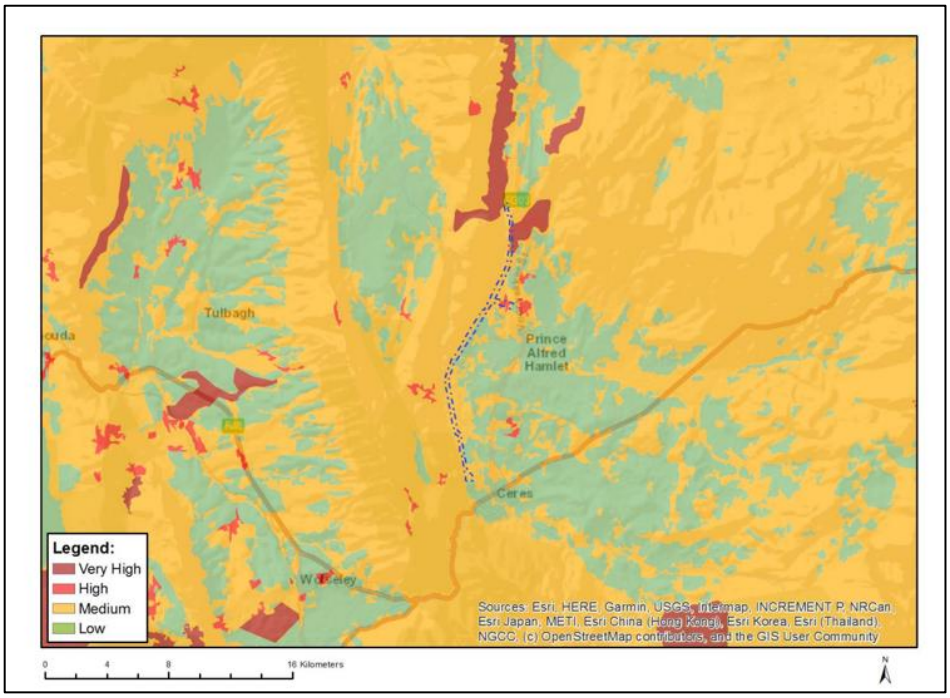


Figure 1B. Map of relative plant species theme sensitivity generated from the DFFE Screening Tool (https://screening.environment.gov.za).

4. STUDY AREA

4.1. LOCALITY

The study area includes two components located as follows:

1. Powerline: The 16 km long x 100 m wide corridor is orientated in a north-south direction between the Witzenberg and Ceres substations, including a tie-in to the proposed new Prince Alfred Hamlet substation (Figure 2);
2. Access roads: various service roads found within, or in some instances outside, the 100 m corridor. These would consist of either temporary or permanent access roads and require either new access routes or upgrading of old roads.

A brief description of the 100 m corridor is provided below:

Ceres substation to proposed Prince Alfred Hamlet substation: a series of farms aligned along portions of the eastern side of the route, with lower slopes of rugged mountains included along the western side of the corridor in places. The portion of the route connecting the main line with the proposed Prince Alfred Hamlet substation traverses undeveloped land.

Prince Alfred Hamlet substation to Witzenberg substation: the main corridor continues through municipal land and rises rapidly up a ridge to the west of Gydo Pass before descending slightly to the Witzenberg substation.

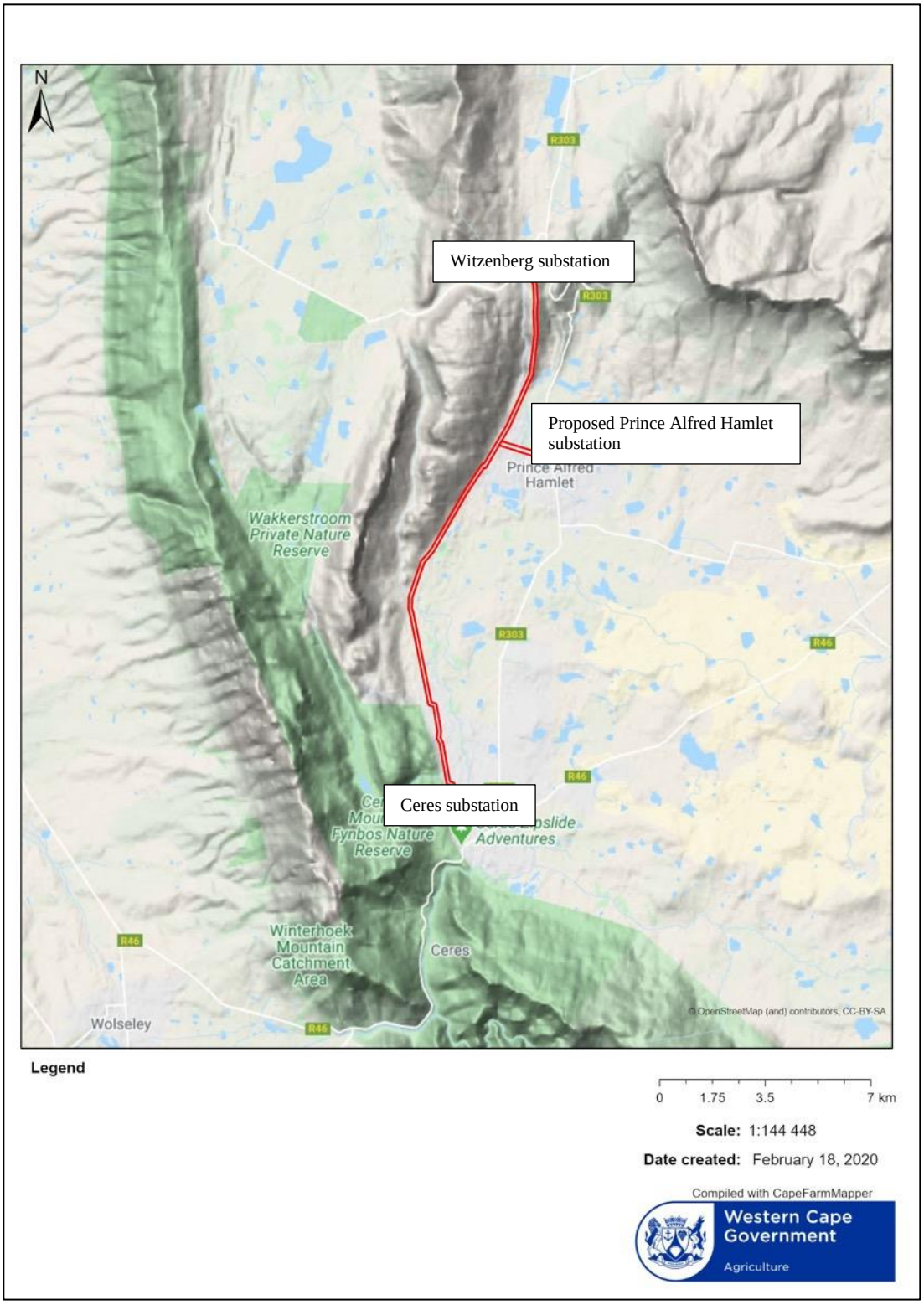


Figure 2. The study area (100 m corridor: red lines) in relation to Witzenberg and Ceres substations (Chief Director, National Geo-spatial Information).

4.2. CLIMATE

The study area falls within a Mediterranean climate; experiencing cool wet winters and warm dry summers. Mean annual precipitation (MAP) varies from 370—1350 mm (mean: 790 mm) with peak rainfall period from May to August (Rebelo *et al.* 2006 in Mucina & Rutherford, 2006) (Figure 3). Mean daily maximum and minimum temperatures are 26.7˚C and 3.1 ˚C for February and July respectively. Frost incidence is 10-30 days per year (Rebelo *et al.* 2006 in Mucina & Rutherford, 2006).

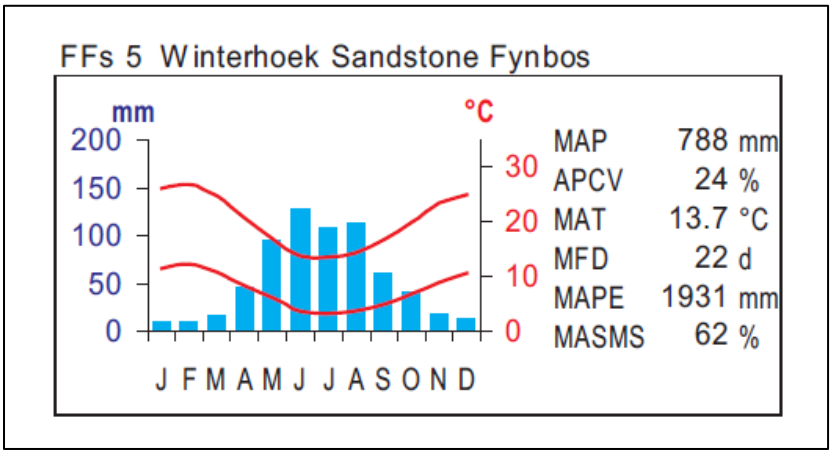


Figure 3. Climatic diagram of the Winterhoek Sandstone Fynbos ecosystem. Blue bars show the median monthly precipitation. The upper and lower red lines show the mean daily maximum and minimum temperature respectively. MAP: Mean Annual Precipitation; APCV: Annual Precipitation Coefficient of Variation; MAT: Mean Annual Temperature; MFD: Mean Frost Days (days when screen temperature was below 0˚C); MAPE: Mean Annual Potential Evaporation; MASMS: Mean Annual Soil Moisture Stress (% of days when evaporative demand was more than double the soil moisture supply) (Rebelo *et al.* 2006 in Mucina & Rutherford, 2006).

4.3. LANDSCAPE AND GEOLOGY

The study area is characterised by a varying landscape with rugged mountain foothills, ridges and flats (see Topocadastral overlay: Figures 4A to 4C). The soil types correspond to vegetation types that are indicated in Figure 4 as described by Rebelo *et al* (2006 in Mucina & Rutherford, 2006):

Winterhoek Sandstone Fynbos: *"Acidic lithosol soil derived from Ordovician sandstone of the Table Mountain Group."*

Ceres Shale Renosterveld: *"Clays derived from shale and sandstone of the Ceres Group and to a lesser extent the Biedouw Subgroups of the Bokkeveld Group."*

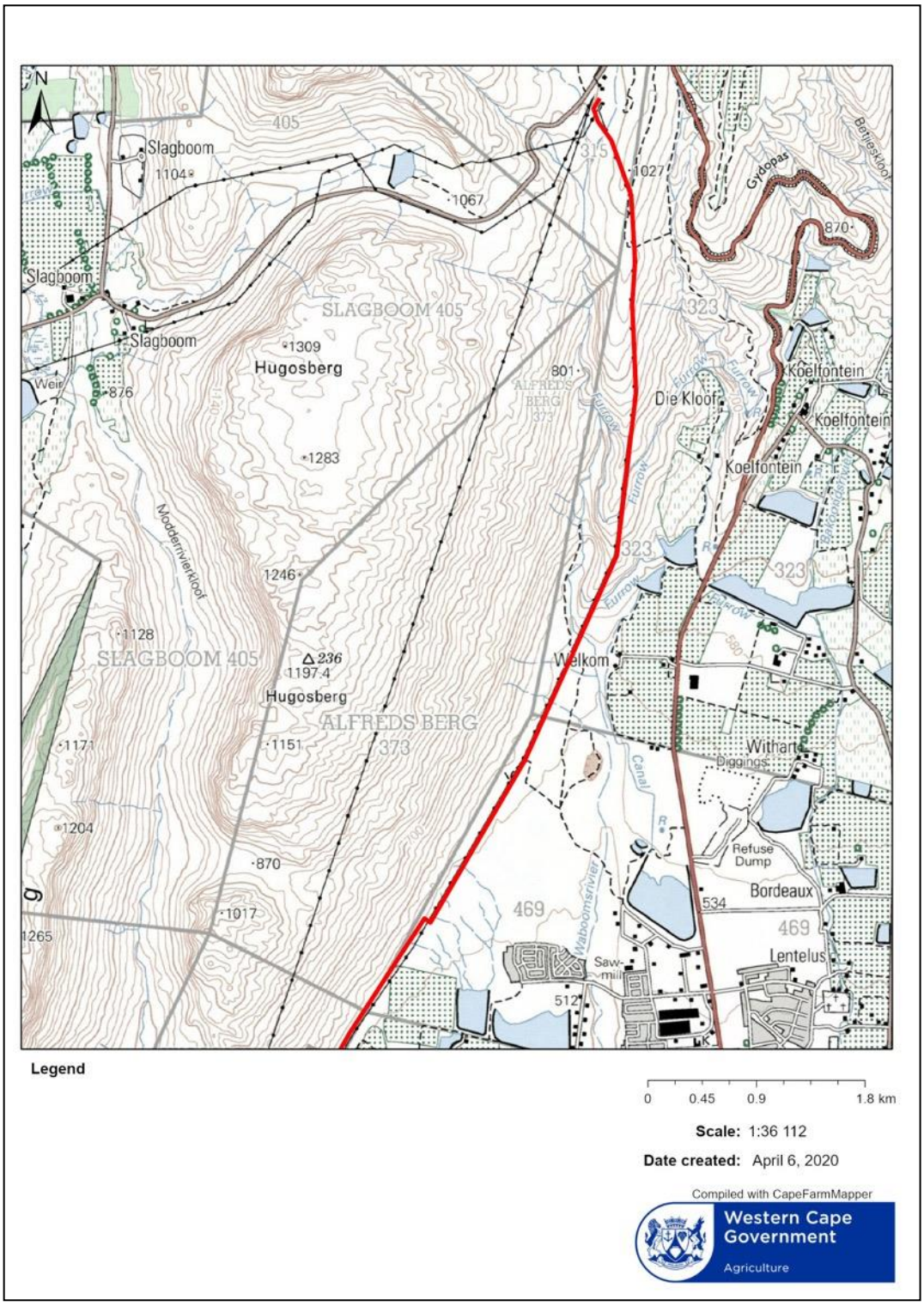


Figure 4A. The northern section of proposed 132kV powerline (red line) represented on a 50K Topocadastral (Department of Rural Development and Land Reform, Chief Directorate: National Geo-Spatial Information, Stellenbosch University, WCDOA).

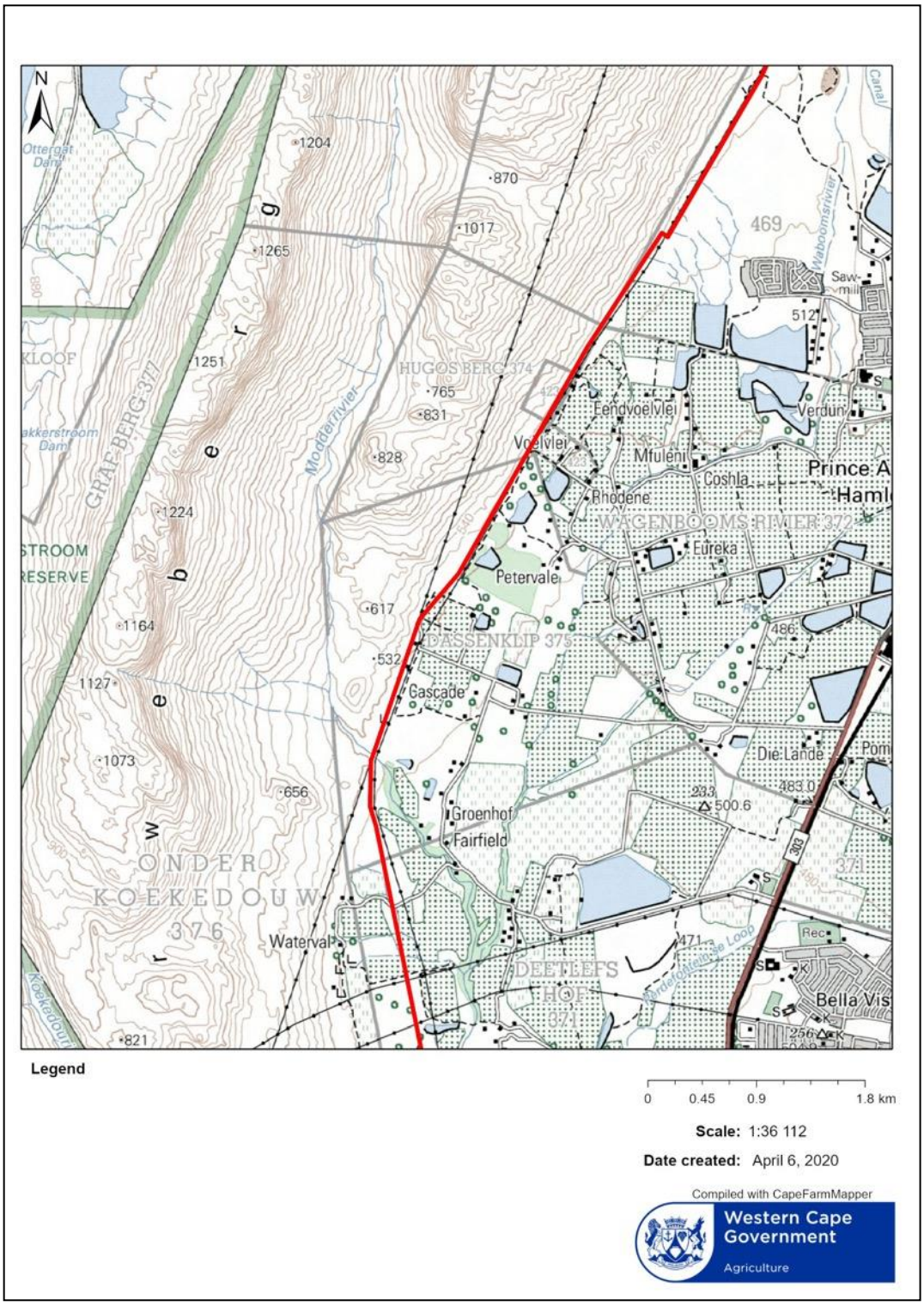


Figure 4B. The central section of proposed 132kV powerline (red line) represented on a 50K Topocadastral (Department of Rural Development and Land Reform, Chief Directorate: National Geo-Spatial Information, Stellenbosch University, WCDOA).

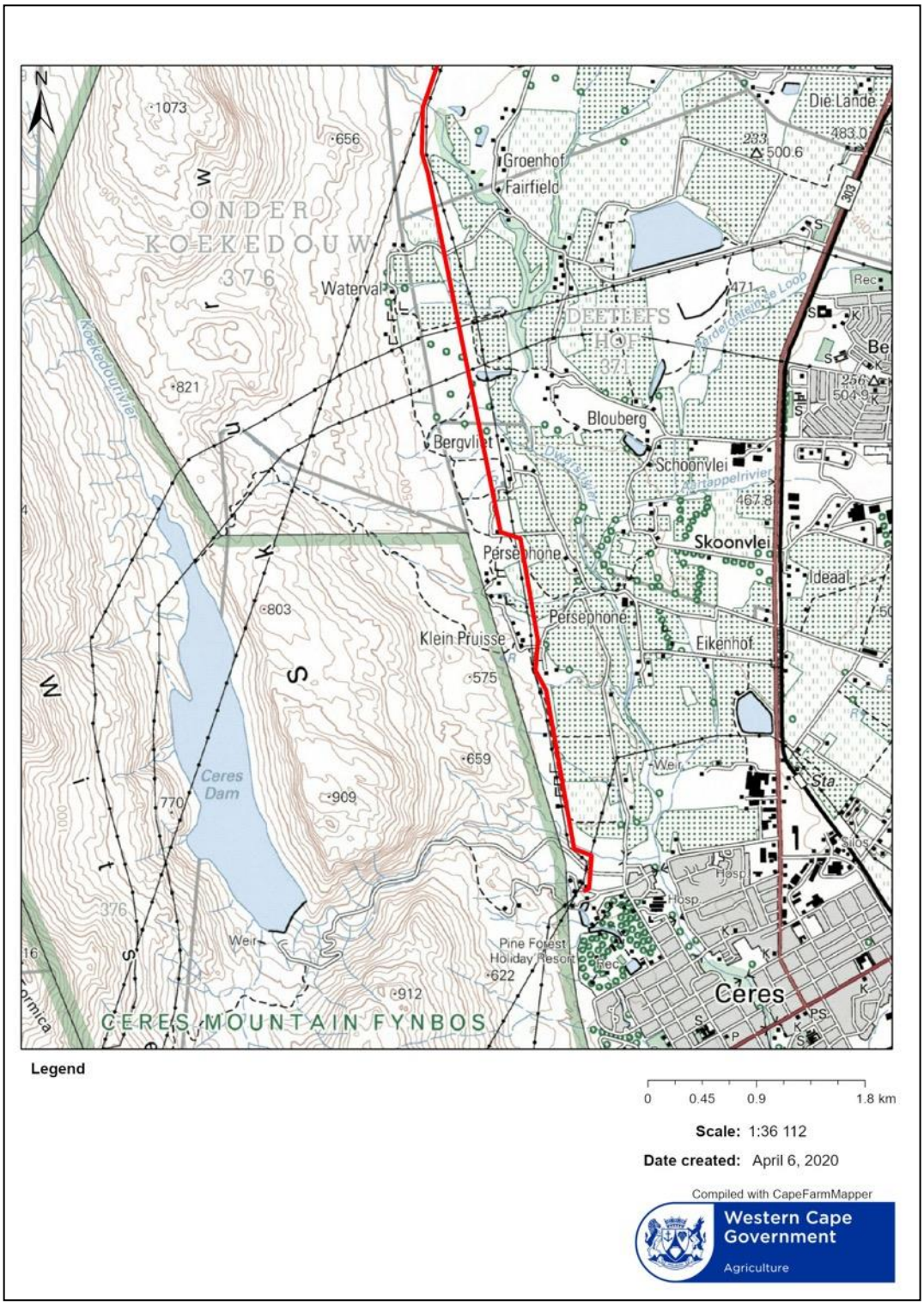


Figure 4C. The southern section of proposed 132kV powerline (red line) represented on a 50K Topocadastral (Department of Rural Development and Land Reform, Chief Directorate: National Geo-Spatial Information, Stellenbosch University, WCDOA).

5. METHODOLOGY, LIMITATIONS AND ASSUMPTIONS

A site survey was carried out on 8, 9 and 10 May 2017 on foot and by vehicle. During this site visit baseline information was obtained. A second site visit was carried out on 23 and 24 May 2017 with the Eskom project team, SRK and the specialist team. Approximately eight hours were spent on site for each survey day. Sample waypoint positions were obtained using a Garmin GPS map 62. Photographs were georeferenced. The following sources have been used to inform this study:

Vegetation map: A product of *The Vegetation of South Africa, Lesotho and Swaziland* (VEGMAP) (Mucina & Rutherford, 2006). The South African National Biodiversity Institute (SANBI) has updated the VEGMAP (2018). These shapefiles were used.

Ecosystem threat status: Informed by (1) Revised National List of Ecosystems that are Threatened and in Need of Protection (Government Gazette, 2022), (2) species information provided in the National List of Ecosystems that are Threatened and in Need of Protection (Government Gazette, 2018), and (3) The National Biodiversity Assessment (SANBI, 2018).

Biodiversity planning: The 2017 Western Cape Biodiversity Spatial Plan (CapeNature, 2017) GIS (Geographical Information System) shapefiles for the Witzenberg Municipality is important for determining the conservation importance of the designated habitat. Ground-truthing is an essential component in terms of determining the habitat condition.

Important species: The presence or absence of threatened (i.e. species of conservation concern), protected and ecologically important species informs the ecological condition and sensitivity of the site. The latest conservation status of species is checked in the Red List of South African Plants (Raimondo et al. 2009) (www.redlist.sanbi.org).

Previous studies: Previous botanical studies at a local scale, if available, are consulted to provide additional information regarding the botanical attributes of the site.

The site visit was carried out during early winter before the peak spring flowering period (August to October). This is a limitation since few geophytes were visible at the time of the survey. The vegetation could, however, be described based on the dominant vegetation cover and since the vegetation cover is mostly dense shrubland most geophytes would only be visible in the first few years after a fire event.

6. VEGETATION DESCRIPTION

6.1. NATIONAL VEGETATION TYPE

The study area encompasses two vegetation types when viewed in relation to *The* V*egetation of South Africa, Lesotho and Swaziland* (VEGMAP) (Rebelo *et al*. 2006 in Mucina & Rutherford, 2006)(Figure 5). These include (1) Winterhoek Sandstone Fynbos, and (2) Ceres Shale Renosterveld. A description of each of the vegetation types and associated landscape features, as described by Rebelo *et al* (2006 in Mucina & Rutherford, 2006), is provided below:

Winterhoek Sandstone Fynbos

"Moderately undulating high plain in the west, with rugged high peaks in the south and southeast, and two linear parallel north-south high mountains in the east, dissected by the Olifants River Valley. The eastern blocks are relatively flat, south- and north-sloping, dissected tablelands. Vegetation is mainly close restioland in deeper moister sands, with low, sparse shrubs that become denser and restios less dominant in the drier habitats. Proteoid and ericaceous fynbos are common on higher slopes while asteraceous fynbos is more common on lower slopes. Cape thicket is prominent on the lower slopes."

Ceres Shale Renosterveld

"Moderately undulating plains and lower mountain slopes supporting medium tall cuppressoid-leaved shrubland dominated by renosterbos. Heuweltjies are prominent in places."

6.2. CONSERVATION STATUS

Ecosystem threat status is derived from three sources. These include the following:

1. The Revised National List of Ecosystems that are Threatened and in Need of Protection (Government Gazette, 2023);
2. The National List of Ecosystems that are Threatened and in Need of Protection (Government Gazette, 2018). This is consulted solely for species information; and
3. The National Biodiversity Assessment (NBA 2018)(SANBI 2018).

The Revised National List of Ecosystems that are Threatened and in Need of Protection (Government Gazette, 2022) lists Ceres Shale Renosterveld as CRITICALLY ENDANGERED due to irreversible loss of habitat whereas Winterhoek Sandstone Fynbos is LEAST CONCERN. The NBA (2018) states the following with respect to the threat status of Ceres Shale Renosterveld: "*Ceres Shale Renosterveld is narrowly distributed with high rates of habitat loss in the past 28 years (1990-2018), placing the ecosystem type at risk of collapse. Scope: Global & national status (global extent assessed)" whereas* "*Winterhoek Sandstone Fynbos has experienced "low rates of natural habitat loss and biotic disruptions, placing this ecosystem at low risk of collapse. Scope: Global & national status (global extent assessed)".*

Ecological drivers

According Cadman *et al.* (2016) the key ecological drivers in **renosterveld** ecosystems include (1) fire and grazing patterns, (2) variations in edaphic conditions and water availability, (3) edaphic boundaries, (4) underlying geology, (5) specialised plant-pollination interactions, (6) plant-plant interactions and (7) living (biogenic) soil crust.

The key ecological drivers in midland and mountain **fynbos** ecosystems according to Cadman *et al*. (2016) include (1) the natural fire regimes and the interplay of fire and grazing, (2) edaphic conditions and underlying lithology, and (3) drainage and soil gradients.

Table 1. Ecosystem threat status according derived from available information sources

Ecosystem status	**The Revised National List of Threatened Terrestrial Ecosystems**
Ceres Shale Renosterveld	Critically Endangered
Reason	Rate of loss of natural habitat
Remaining % of ecosystem	44%
Protected area %	1.5%
Original area	49173 ha
Conservation target	Data deficient (previously in the NBA 2018 the conservation target was 27%)
Species of special concern	7 Threatened species and 3 endemic species.
Winterhoek Sandstone Fynbos	Least Concern
Reason	Well protected
Remaining % of ecosystem	93%
Protected %	80.3%
Original area	113596 ha
Conservation target	29% (NBA 2018)
Species of special concern	Data deficient

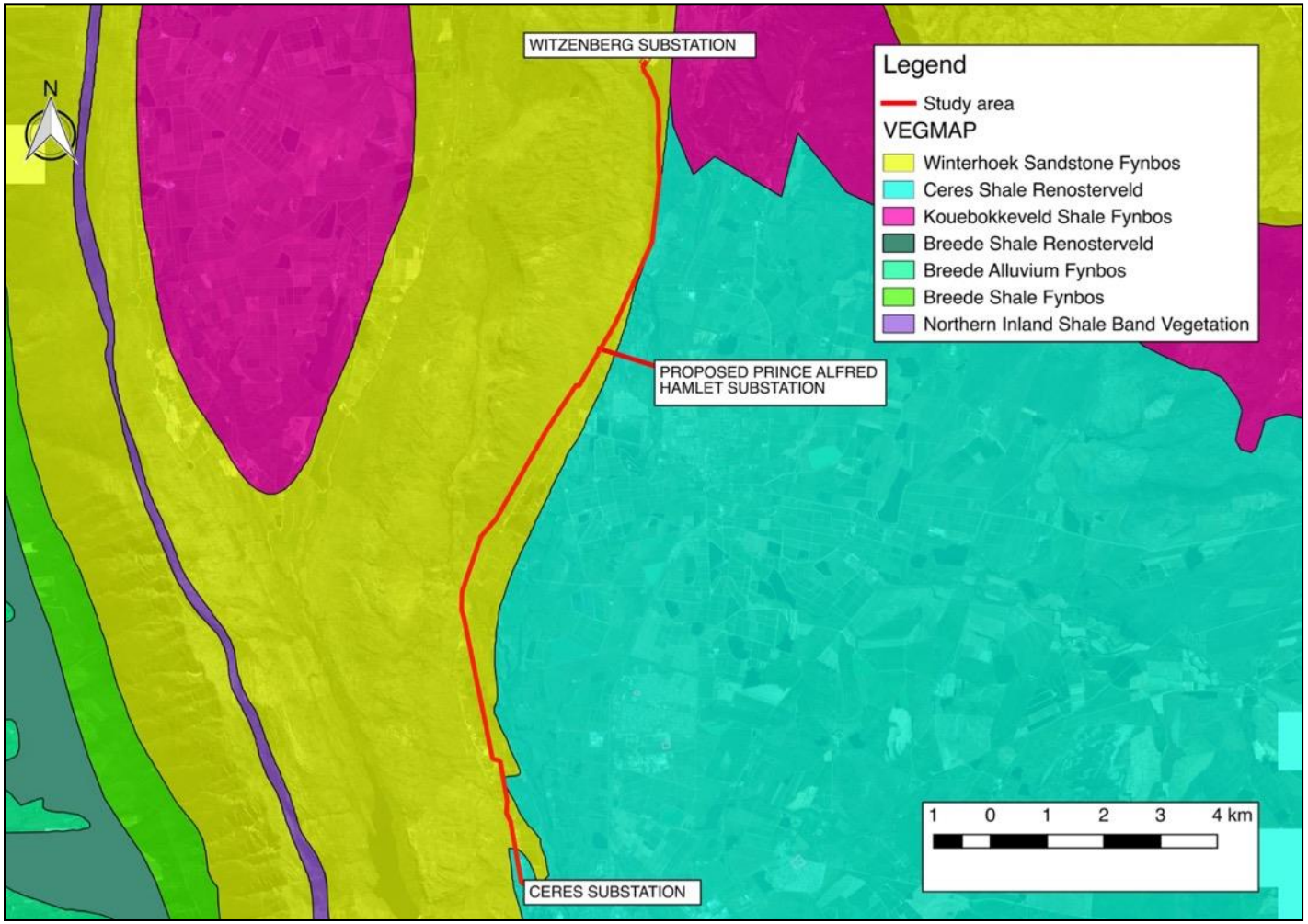


Figure 5. VEGETATION MAP: The study area superimposed on a portion of *The Vegetation Map of South Africa, Lesotho and Swaziland* (SANBI, 2018) represented on a Bing aerial image.

6.3. CONSERVATION PLANS

The 2017 WCBSP Handbook (Pool-Stanvliet et al., 2017) distinguishes between the various conservation planning categories. The purpose of the WCSBP is to inform sustainable development, including (a) development planning, (b) environmental assessemnt and regulation, (c) natural resource protection and management in the broader sense. Critical Biodiversity Areas are habitats with high biodiversity and ecological value. Such areas include those that are likely to be in a natural condition (CBA 1) and those that are potentially degraded or represent secondary vegetation (CBA 2). Ecological Support Areas are not essential for meeting biodiversity targets. They play an important role in supporting the functioning of Protected Areas or CBAs and are often vital for delivering ecosystem services. A distinction is made between ESAs that are still likely to be functional (i.e. in a natural, near-natural or moderately degraded condition; (ESA 1) and Ecological Support Areas that are severely degraded, or have no natural cover remaining, and therefore require restoration (ESA 2). Other Natural Area (ONA) sites are not currently identified as a priority, but retain most of their natural character and perform a range of biodiversity and ecological infrastructure functions. Although not prioritised, they are still an important part of the natural ecosystem. Protected Areas are also included in the 2017 WCBSP. These include private and state-owned nature reserves. Ground-truthing of the assigned CBA and ESA sites are described. The distribution of these sites is shown in Figure 6A and 6B. The reasons for each CBA category are provide in Table 1 below.

Witzenberg Substation to Prince Alfred Hamlet

This first section between the Witzenberg Substation and Tower 69 is a Protected Area (Ceres Mountain Fynbos Nature Reserve). The route continues south from Tower 69 through CBA1 and ESA1 until the Prince Alfred Hamlet Tie-in.

Prince Alfred Hamlet Tie-in

The entire Tie-in section up to the Prince Alfred Hamlet Substation is a CBA1. This area is an upland-lowland interface with known subpopulation of Critically Endangered Witsenberg conebush (*Leucadendron chamelaea*).

Prince Alfred Hamlet to Ceres Substation

The section south of the Prince Alfred Hamlet Tie-in is mostly ESA1 areas and to a lesser degree CBA1 and ESA2.

Table 1. CBA categories, reasons and management objectives.

CBA Category	Reason	Management objectives
Protected Area	Nature Reserve and Mountain Catchment Area	
CBA1: Terrestrial	General: Ecological processes Threatened SA Vegetation Type, Threatened Vertebrate.	Degraded areas should be rehabilitated. Only low-impact, biodiversity-sensitive land uses are appropriate.
CBA2: Terrestrial	General: Ecological processes Threatened SA Vegetation Type, Threatened Vertebrate.	Maintain in a natural or near-natural state, with no further loss of habitat. Degraded areas should be rehabilitated. Only low-impact, biodiversity-sensitive land-uses are appropriate.
ESA1: Aquatic	Ecological processes, River Type, Water resource protection, River, Wetland, Watercourse.	Maintain in a functional, near-natural state. Some habitat loss is acceptable, provided the underlying biodiversity objectives and ecological functioning are not compromised.
ESA2: Aquatic	Ecological processes, River Type, Water resource protection, River, Wetland, Watercourse.	Restore and/or manage to minimize impact on ecological processes and ecological infrastructure functioning, especially soil and water-related services, and to allow for faunal movement.

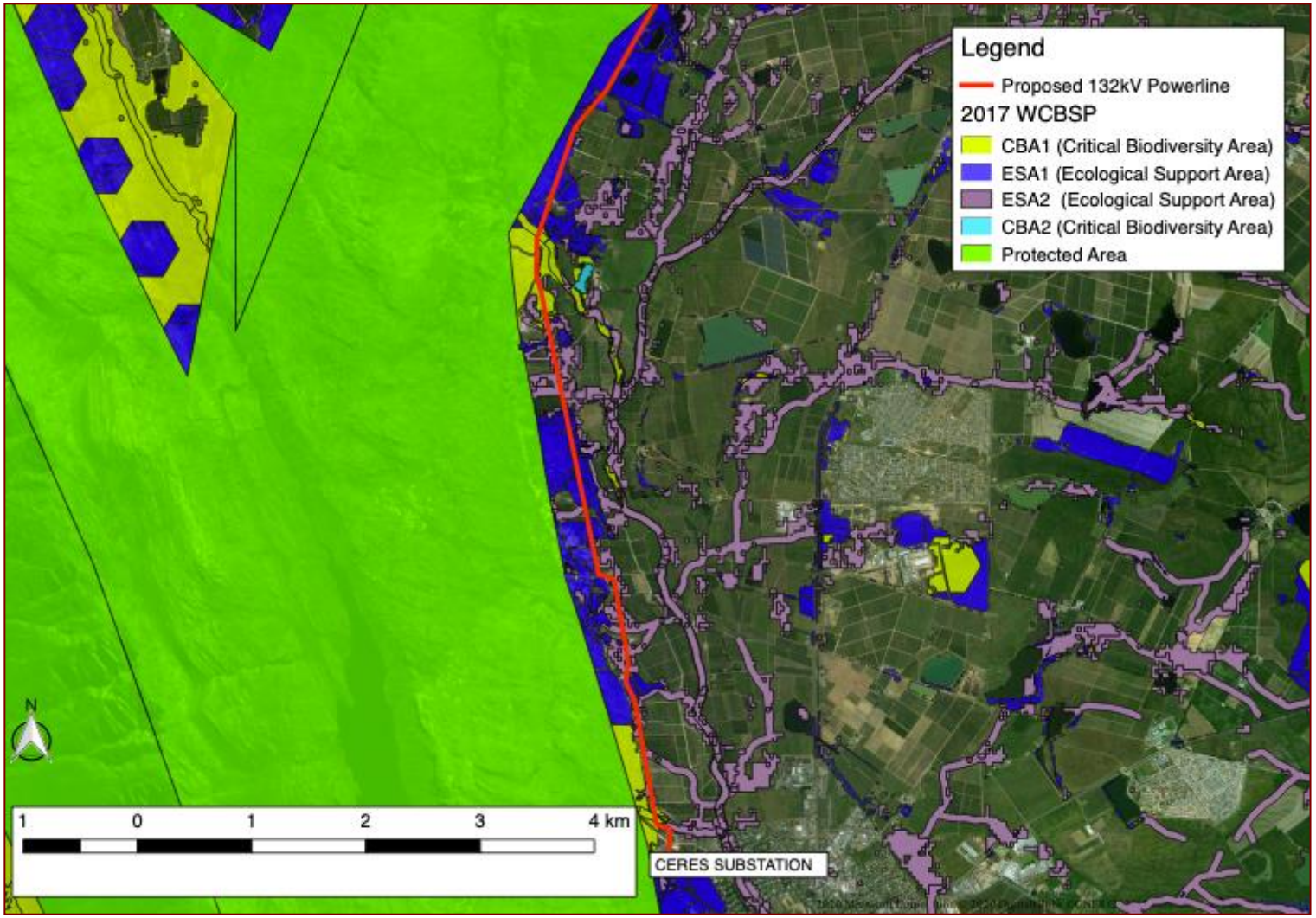


Figure 6A. CONSERVATION PLANNING MAP: The southern half of the study area in relation to the 2017 WCBSP overlaid on a Bing aerial image.

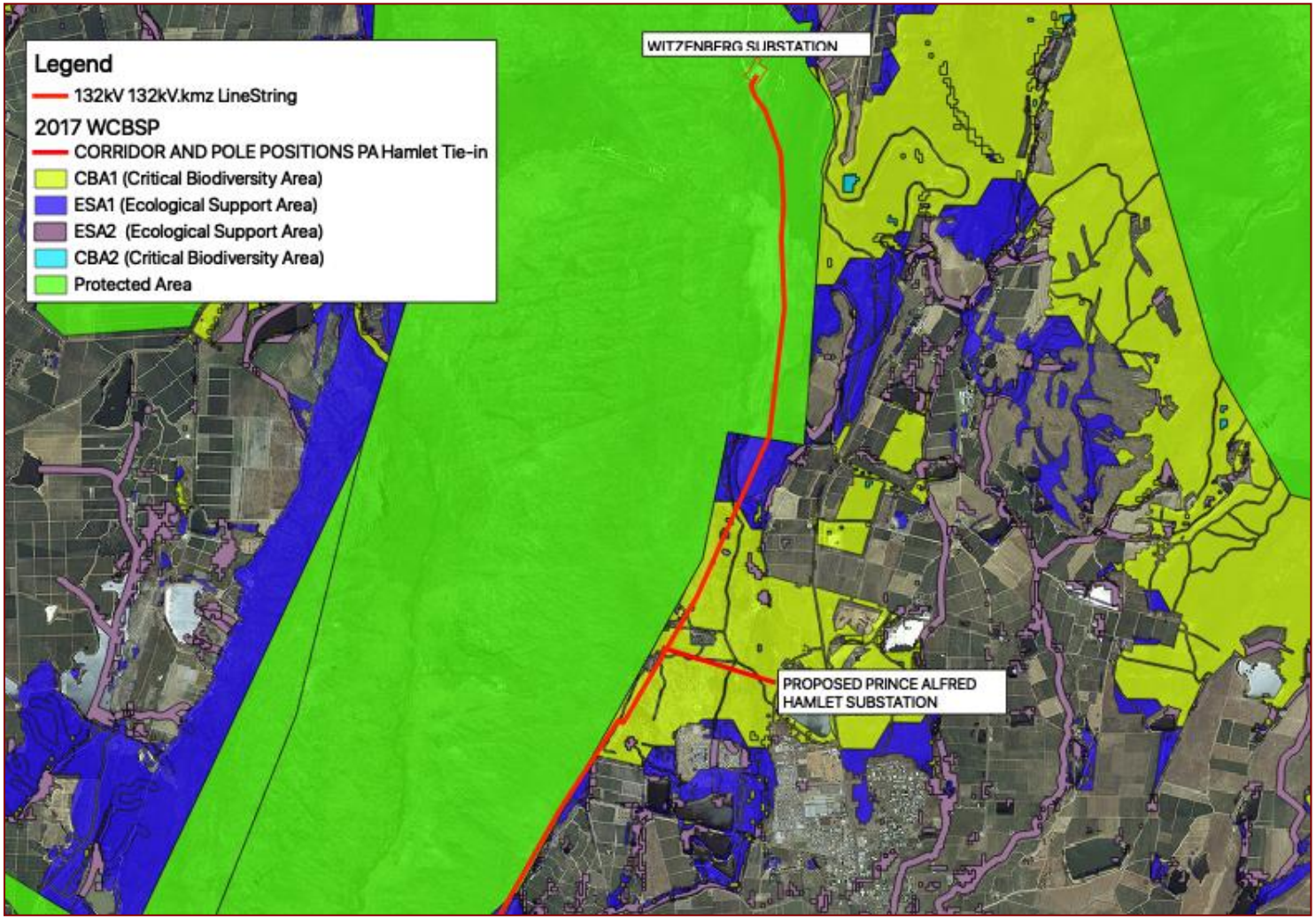


Figure 6B. CONSERVATION PLANNING MAP: The northern half of the study area in relation to the 2017 WCBSP overlaid on a Bing aerial image.

6.4. THE VEGETATION AND SENSITIVITY OF THE STUDY AREA

A detailed description of the vegetation along the 100 m corridor and the proposed Prince Alfred Hamlet substation is provided in tabular format below. The project area is divided into sections between each of the substations (e.g. Witzenberg substation to Ceres substation). The information is presented directionally from north to south since this was deemed the most practical direction in which to survey the area. The broad habitats are described according to the habitat condition categories listed in Table 2.

Table 2. Habitat category descriptions and criteria

Habitat category	Description
Intact vegetation	A true representation of the original vegetation type in terms of structure and species makeup. Minimal soil disturbance. Unlikely to have ever been ploughed. Disturbance may be evident.
Semi-intact	Resembles the original vegetation type in terms of structure and species makeup but has lower species diversity than intact vegetation. Dominated by disturbance-resilient species. Soils may have been heavily disturbed in the past. Restoration potential is high.
Degraded	Only a few species representative of the original vegetation type are present. The vegetation has undergone heavy disturbance. Restoration potential is either low or moderate.
Highly degraded	The original vegetation is usually absent and has been removed in the past. Only a few remnant or pioneer species are present. Soils usually ploughed in the past. Restoration potential is very low.
Transformed	No remnant species exist anymore. The landscape is altered irreversibly with no restoration potential. Examples include cultivated farmland and the built environment.

Sensitivity

Sensitivity is defined here as the **'conservation value'** together with the **'degree of resilience to disturbance'**. The conservation value relates to the conservation status (including the ecosystem threat status) and other factors including ecological connectivity, habitat condition, persistence of ecological process and the site's role in supporting biodiversity. The degree of resilience takes into consideration factors such as sensitivity to disturbance and restoration

potential. The vegetation descriptions provide the basis for assigning a sensitivity rating (Table 3). Sensitivity maps are presented in this section with the accompanying habitat maps. The sensitivity ratings include (a) very low, (b) low, (c) medium, (d) high, and (e) very high. Sensitivity is derived from the following:

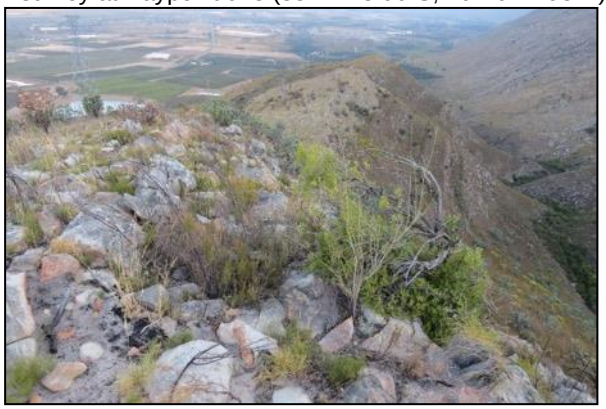
1. Ecosystem status: based on the threat status of vegetation types (i.e. Least Threatened, Vulnerable, Endangered and Critically Endangered).
2. Ecological condition: based on ecological condition of the vegetation units shown in the habitat maps.
3. Conservation plans: presence or absence and ground-truthing of Critical Biodiversity Areas (CBA), Ecological Support Areas (ESA), and Protected Areas.
4. Degree of fragmentation likely to be imposed by the project: considers the overall effects at a local scale.
5. Presence of important species: ecologically important and/or threatened species, or species endemic to the area that may be affected.

Table 3. Description of sensitivity categories.

Sensitivity rating	Description
Very Low	Usually transformed habitats with no remaining natural vegetation and with no to very limited spatial ecological function.
Low	Usually degraded areas with compromised ecological integrity and low species diversity. Potentially important from a spatial ecological perspective.
Medium	Usually intact vegetation with functioning ecological processes in Least Threatened and sometimes threatened ecosystems.
High	Intact vegetation or special habitats (e.g. wetlands) with functioning ecological processes in ecosystems ranging from Least Threatened to Critically Endangered. May include ESAs, CBAs and Protected areas. Habitats are highly susceptible to loss of habitat and fragmentation and should only be impacted under certain conditions; assessed on a case by case basis.
Very High	Intact vegetation or very special habitats (e.g. wetlands, indigenous forests or species of conservation concern) with functioning ecological processes in ecosystems ranging from Least Threatened to Critically Endangered. May include ESAs, CBAs and Protected areas. Habitats are highly susceptible to loss of habitat and fragmentation and should never be impacted.

Description of the vegetation and habitats along the 100m corridor and proposed 132kV powerline from the Witzenberg Substation to the Ceres Substation via the Proposed Prince Alfred hamlet Substation Tie-In.

Illustrations	**Affected area**
 **Figure 7.1.1.** Southeast view from Waypoint 038 (33°13'46.87"S; 19°19'4.94"E) showing the existing powerline leading up to the ridge. The disturbed area in the foreground is suitable area for a tower position.  **Figure 7.1.2.** View of the existing powerline from waypoint 038 showing dense stands of *Protea laurifolia* below the ridgeline.	**WITZENBERG SUBSTATION TO PRINCE ALFRED HAMLET** The terrain between the Witzenberg Substation and lowlands at the bottom of the Gydo Pass comprises mountainous terrain through a Protected Area, with the major portion of the route extending over a prominent ridge, starting at waypoint 046 (33°14'15.70"S; 19°19'11.65"E). The ridgeline runs along the western side of the 100 m corridor. The route traverses intact Winterhoek Sandstone Fynbos between Waypoint 038 (33°13'46.87"S; 19°19'4.94"E) (Tower 86) and waypoint 066 (33°15'45.33"S; 19°18'57.23"E) (Tower 66). The area between the substation crosses a stream and wetland system located between Tower 80 and Tower 79 before rising up to the ridge. The wetland supports high numbers of *Leucadendron salicifolium, Prionium serratum, Cannamois virgata* and moderate infestations of invasive *Acacia mearnsii* (black wattle). The slope leading to the ridge supports high numbers of *Protea laurifolia* (Figure 7.1.1 and 7.1.2). The species is the most abundant tree along this section. Waboom trees (*Protea nitida*) are found in low numbers along this section, unlike parts of Gydo Pass that contains almost pure stands of the species. Dominant species: *Pentameris* sp., *Protea laurifolia, Protea repens* and *Restio* cf*. capensis.* Additional species: *Cliffortia ruscifolia*, *Coleonema juniperinum, Rafnia angulata, Cannamois virgata, Anthospermum aethiopicum, Leucadendorn salignum, Metalasia acuta, Erica* sp. and *Tetraria* sp.

Illustrations	Affected area
 **Figure 7.1.3.** Recently burnt vegetation photographed during the 2017 survey at waypoint 048 (33°14'23.06"S; 19°19'11.93"E).  **Figure 7.1.4.** Rock outcrops support shrubs such as *Maytenus oleoides*. Waypoint 058 (33°14'56.34"S; 19°19'11.04"E).	**WITZENBERG SUBSTATION TO PRINCE ALFRED HAMLET (MOUNTAINS)** At the time of the survey in 2017 a recent fire had occurred in the area between waypoint 047 (33°14'19.56"S; 19°19'11.86"E) to 066 (33°15'45.33"S; 19°18'57.23"E) (Figure 7.1.3). The vegetation between these points is dominated by the low vegetation with resprouting grasses, restioids and shrubs. Rock outcrops along the ridgeline support shrubs such as *Maytenus oleoides* (Figure 7.1.4) and *Searsia scytophylla* (waypoint 051: 33°14'28.68"S; 19°19'11.22"E; 052: 33°14'32.09"S; 19°19'11.05"E; 058: 33°14'56.34"S; 19°19'11.04"E). Dominant species include *Corymbium glabrum, Pentameris* sp. Although only a few species were visible due to the recent fire, the habitat is likely to support a similar array of species found in the unburnt vegetation at waypoint 045 (33°14'8.09"S; 19°19'7.39"E). Other dominant species are thus likely to include *Elegia filacea, Elegia stipularis, Metalasia acuta, Stoebe plumosa* and *Thamnochortus lucens.* Additional species include *Protea laurifolia, Protea punctata, Protea nitid*a, *Protea repens* and *Senecio pinifolius*. Infestations of invasive *Hakea sericea* (silky hakea) were found at waypoint 056 (33°14'49.30"S; 19°19'12.34"E).

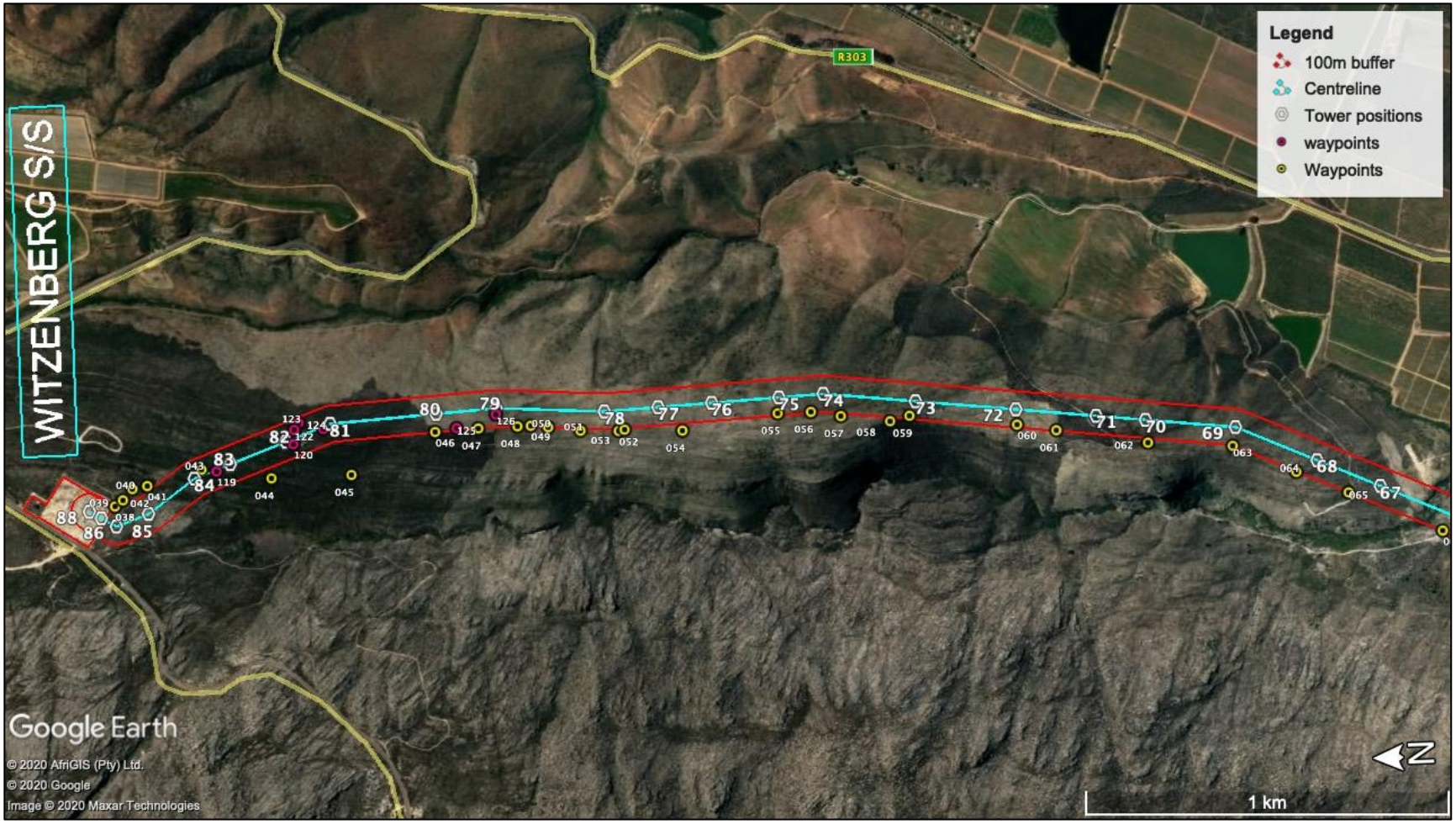


Figure 7.2.1. SURVEY MAP: Google Earth™ aerial image showing 100m corridor (red lines) and proposed 132kV powerline (blue line) extending from the Witzenberg substation towards Prince Alfred Hamlet, showing the sample waypoints (numbered yellow and pink circle icons) are indicated and Tower 088 to Tower 67. Note the position of the north arrow on the rotated image.

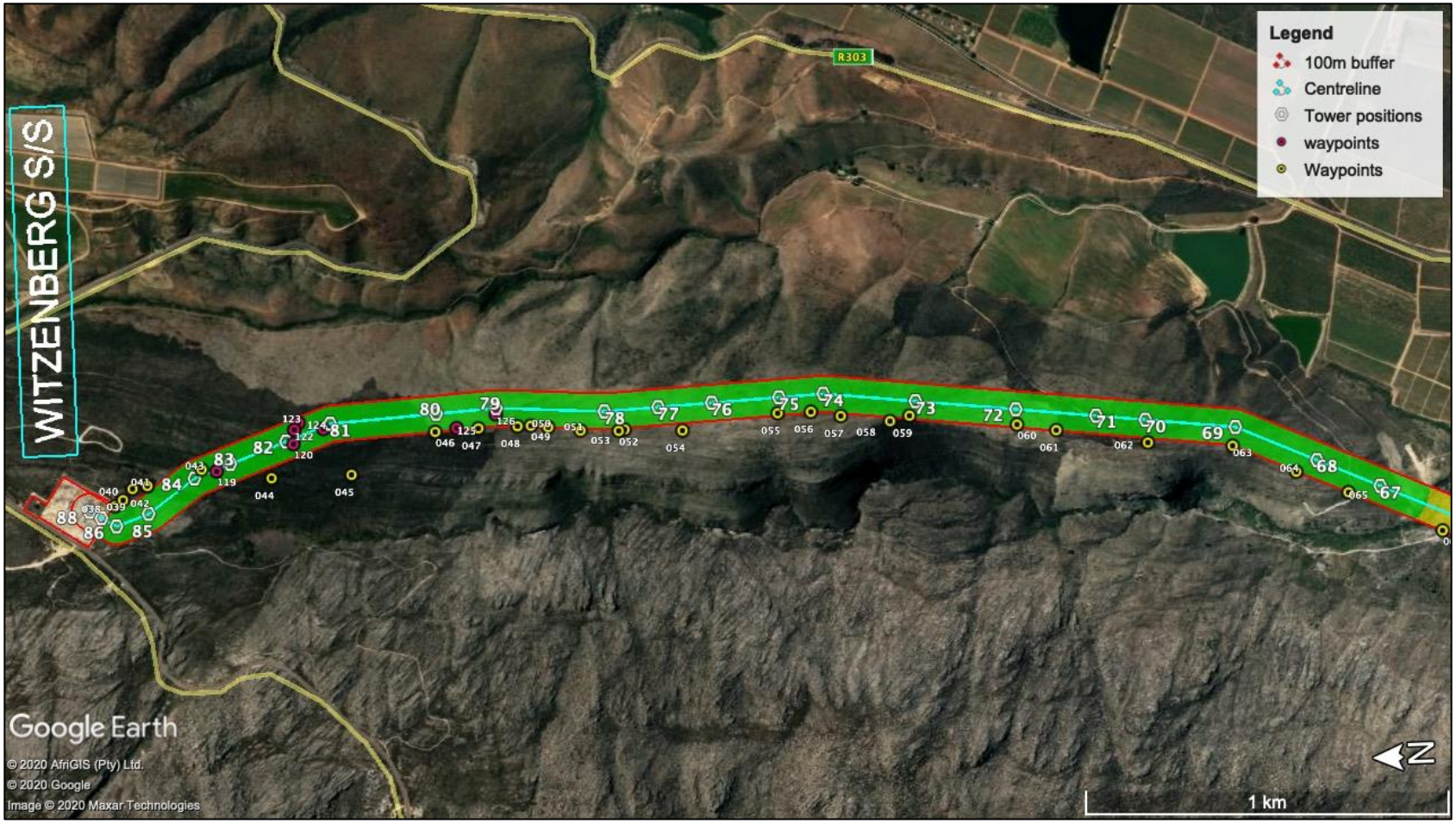


Figure 7.2.2. HABITAT MAP: Google Earth™ aerial image showing 100m corridor (red lines) and proposed 132kV powerline (blue line) extending from the Witzenberg substation towards Prince Alfred Hamlet, showing the broad habitat types (green = intact vegetation; yellow = semi-intact vegetation). The yellow areas with semi-intact vegetation contain patches of alien plants within a wetland/dryland mosaic. The sample waypoints (numbered yellow and pink circle icons) are indicated and Tower 088 to Tower 67. Note the position of the north arrow on the rotated image.

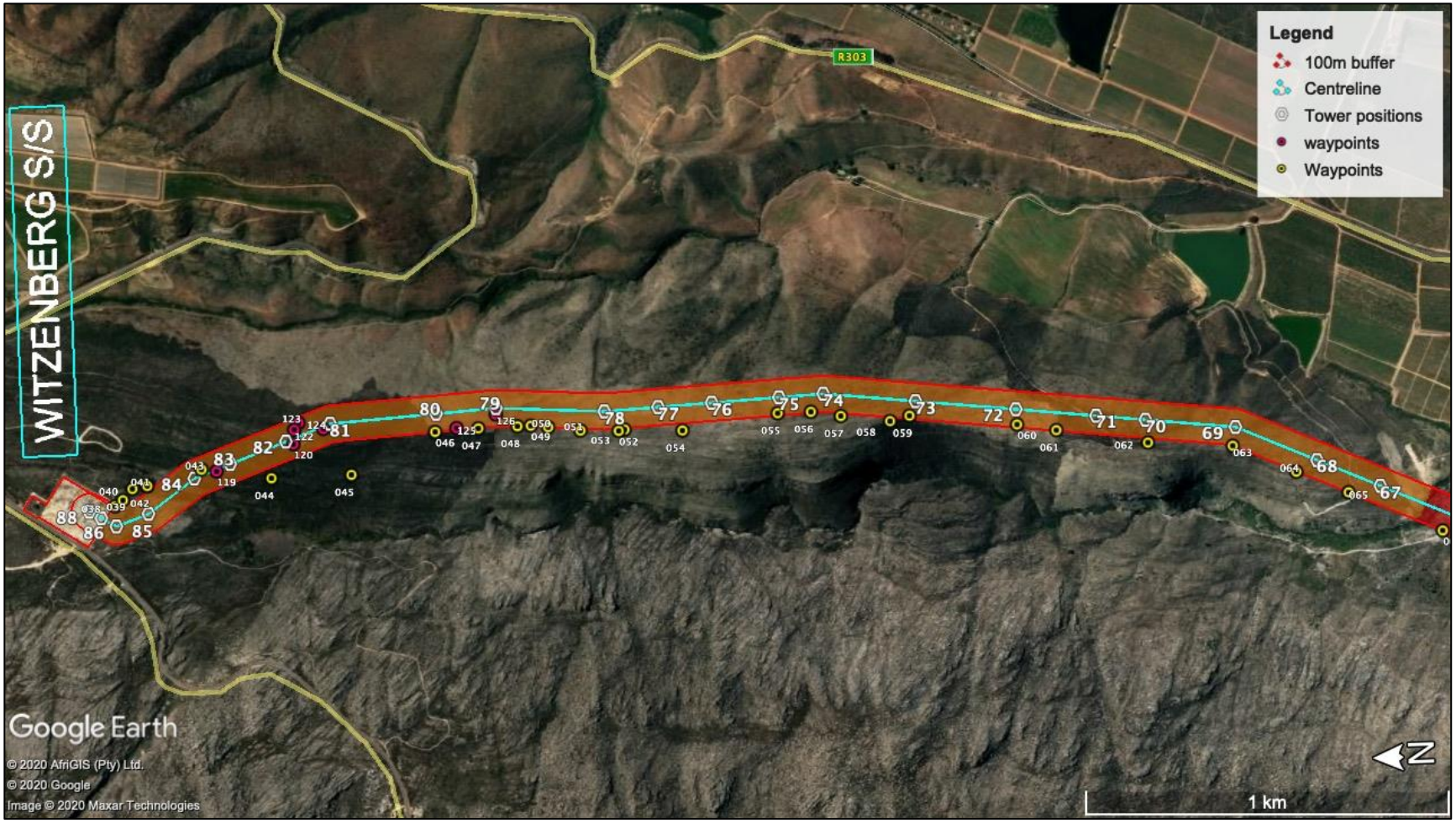


Figure 7.2.3. SENSITIVITY MAP: Google Earth™ aerial image showing 100 m corridor (red lines) and the proposed 132kV powerline (blue line) extending from the Witzenberg substation towards Prince Alfred Hamlet, showing habitat sensitivity (orange = medium sensitivity; light red = high sensitivity). The sample waypoints (numbered yellow and pink circle icons) are indicated and Tower 088 to Tower 67. Note the position of the north arrow on the rotated image.

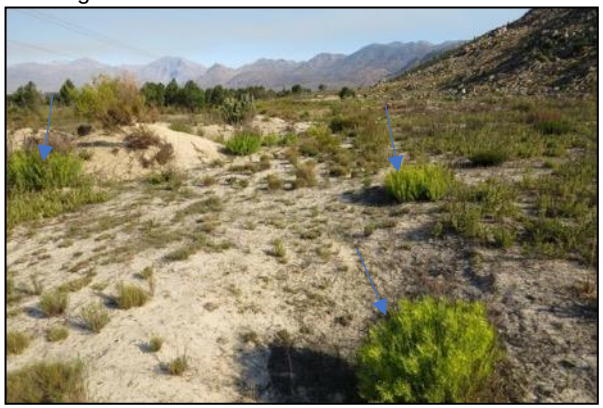
Illustrations	**Affected area**
 **Figure 7.3.1.** Disturbed area at waypoint 066 (33°15'45.33"S; 19°18'57.23"E) showing semi-intact vegetation in the flats below the ridge that end at this point. Note the alien gum and pine trees in the background.  **Figure 7.3.2.** Recently burnt vegetation photographed in 2017 with resprouting plants of *Leucadendron salignum* (blue arrows) at waypoint 099 (33°16'36.96"S; 19°18'25.63"E) just west of the new alignment.	**WITZENBERG SUBSTATION TO PRINCE ALFRED HAMLET (FLATS)** The flats at the foothills comprise a mix of semi-intact natural vegetation and alien vegetation. The alien vegetation consists of pine (*Pinus radiata*), black wattle (*Acacia mearnsii*) and gum (*Eucalyptus* sp.) species (Figure 7.3.1). The natural vegetation consists of a mosaic of open disturbed areas with patches of vegetation of varying sizes within an equally patchy wetland/dryland mosaic. The area is probably subjected to frequent fire events, which are thought to be the result of accidental fires cause by people frequenting the area (probably firewood collectors) (Figure 7.3.2). The habitat extends from waypoint 066 (33°15'45.33"S; 19°18'57.23"E) (Tower 61) southwards past waypoint 100 (33°16'48.59"S; 19°18'17.52"E), ending at transformed farmland. The area supports a population of the CRITICALLY ENDANGERED *Leucadendron chamelaea.* Plants were found at waypoint 096 (33°16'30.25"S; 19°18'39.96"E) about 10 m south-east of Tower 89. The species was found in the same area by Helme in 2013 who noted that the species occurs in high numbers but is highly threatened by sand mining, invasive alien plants and informal settlement (http://www.ispotnature.org/node/520826). Scattered individuals of the species are likely to occur within the yellow shaded areas indicated in Figure 7.4.2. For this reason, the area has been assigned as having 'very high sensitivity (Figure 7.4.3). Dominant species: *Athanasia trifurcata, Cliffortia ruscifolia, Dodonaea viscosa, Diospyros glabra, Leucadendron salignum, Othonna parviflora, Rafnia angulata* and *Stoebe plumosa*.

Figure 7.4.1. SURVEY MAP: Google Earth™ aerial image showing 100 m corridor (red lines) and the proposed 132kV powerline (blue line) from waypoint 063 to 070 (yellow and pink numbered circle icons) and Towers 69 to Tower 50 along the main powerline. Towers 89 to Tower 92 and the proposed Prince Alfred Hamlet Substation and Tie-In are indicated. Note the position of the north arrow on the rotated image.

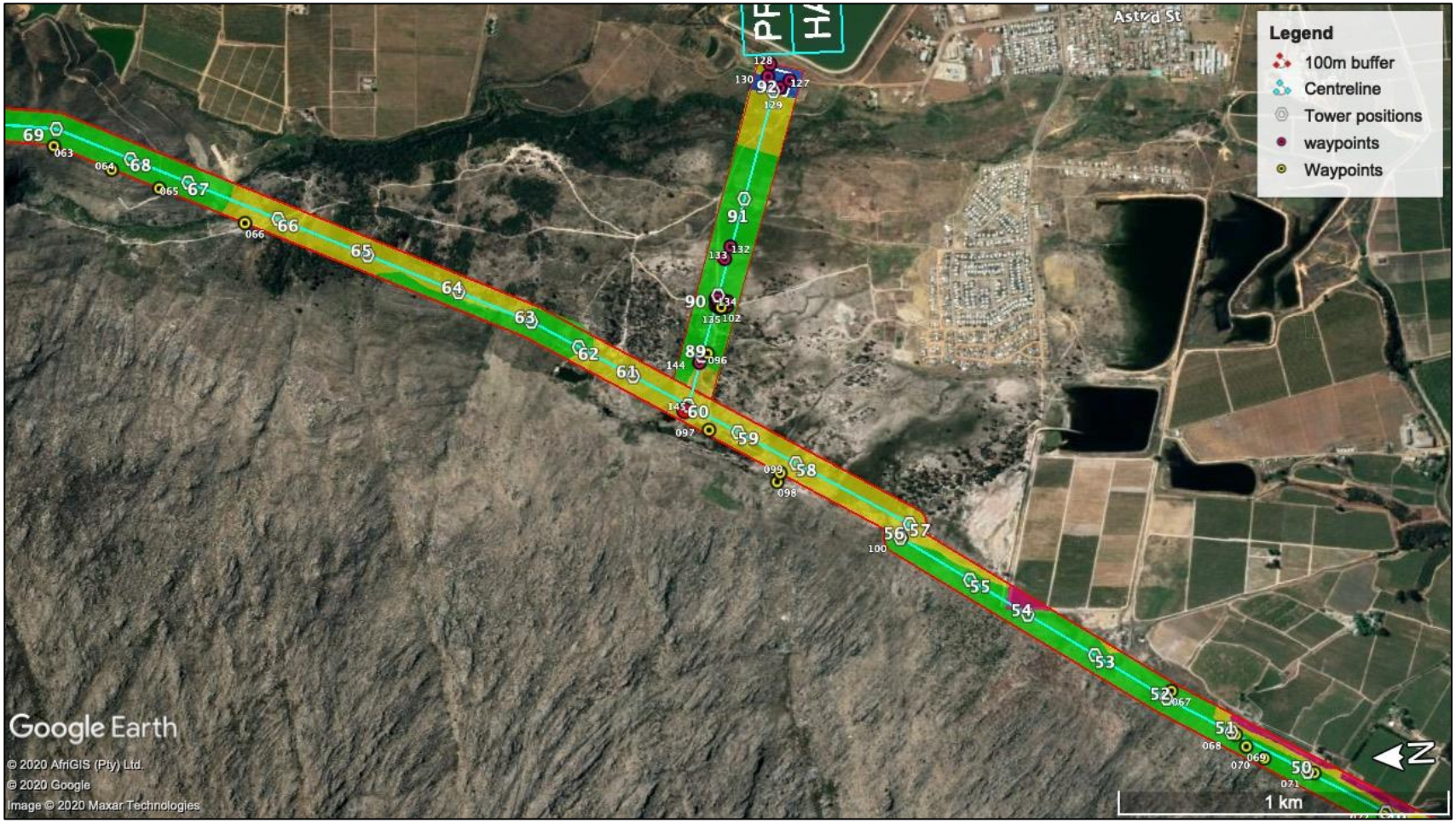


Figure 7.4.2. HABITAT MAP: Google Earth™ aerial image showing 100m corridor (red lines) and the proposed 132kV powerline, showing the broad habitat types (green = intact vegetation; yellow = semi-intact vegetation; pink = transformed). The waypoints 063 to 070 are indicated (yellow and pink numbered circle icons) and Towers 64 to Tower 46 along the main powerline. Towers 84 to Tower 87 and the proposed Prince Alfred Hamlet Substation and Tie-In are indicated. Note the position of the north arrow on the rotated image. Note the position of the north arrow on the rotated image.

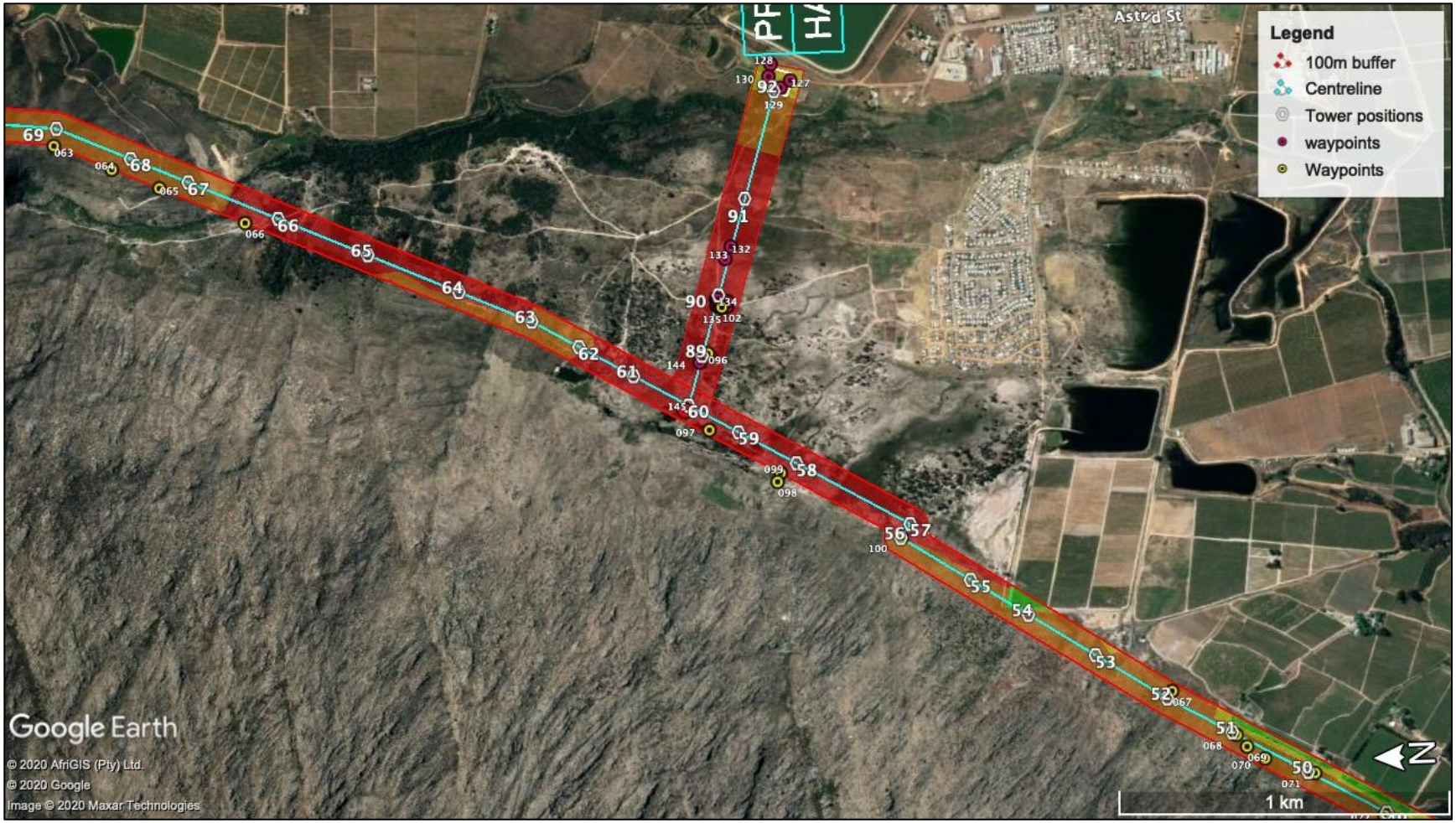


Figure 7.4.3. SENSITIVITY MAP: Google Earth™ aerial image showing 100m corridor for the proposed 132kV powerline extending from waypoint 063 to 070, showing the sensitivity (orange = medium sensitivity; red = very high sensitivity; lime = low sensitivity; green = very low sensitivity) and Towers 69 to Tower 50 along the main powerline. Towers 89 to Tower 92 and the proposed Prince Alfred Hamlet Substation and Tie-In are indicated. Note the position of the north arrow on the rotated image.

Illustrations	Affected area
 **Figure 7.5.1.** The CRITICALLY ENDANGERED *Leucadendron chamelaea* at waypoint 102 (33°16'31.77"S; 19°18'45.32"E).  **Figure 7.5.2.** The proposed Prince Alfred Hamlet Substation site at waypoint 130 (33°16'37.16"S; 19°19'12.19"E).	**PRINCE ALFRED HAMLET SUBSTATION AND TIE-IN** The powerline connection from the proposed 132kV powerline leading to Prince Alfred Hamlet substation traverses the habitat where the CRITICALLY ENDANGERED *Leucadendron chamelaea* was found. The species was recorded at several localities, including waypoint 096 (33°16'30.25"S; 19°18'39.96"E), waypoint 133 (33°16'32.28"S; 19°18'50.99"E) and high numbers in the vicinity of 102 (33°16'31.77"S; 19°18'45.32"E). The habitat is rated as having Very High sensitivity. **The localities of *Leucadendron chamelaea* are indicated as very high sensitivity areas (bright red) in Figure 7.6.3 and 6.6.4.** The proposed Prince Alfred Hamlet Substation site is located in a highly degraded site. The site is used for dumping and presumably as storage area for construction projects. The site is dominated by *Athanasia trifurcata* and *Cynodon dactylon*. Invasive species include Port Jackson willow (*Acacia saligna*), black wattle (*Acacia mearnsii*) and agave *(Agave americana*). A small patch of semi-intact fynbos occurs at the north-eastern corner. Dominant species include *Leucadendron salignum*, *Montinia caryopyllacea*, *Aspalathus spinosa*, *Thamnochortus* sp., *Restio* sp. and *Searsia* sp. Additional species include *Cliffortia ruscifolia, Asparagus capensis, Dodonaea angustifo*lia, *Diosma* sp. and *Salvia chamelaeagnea*.

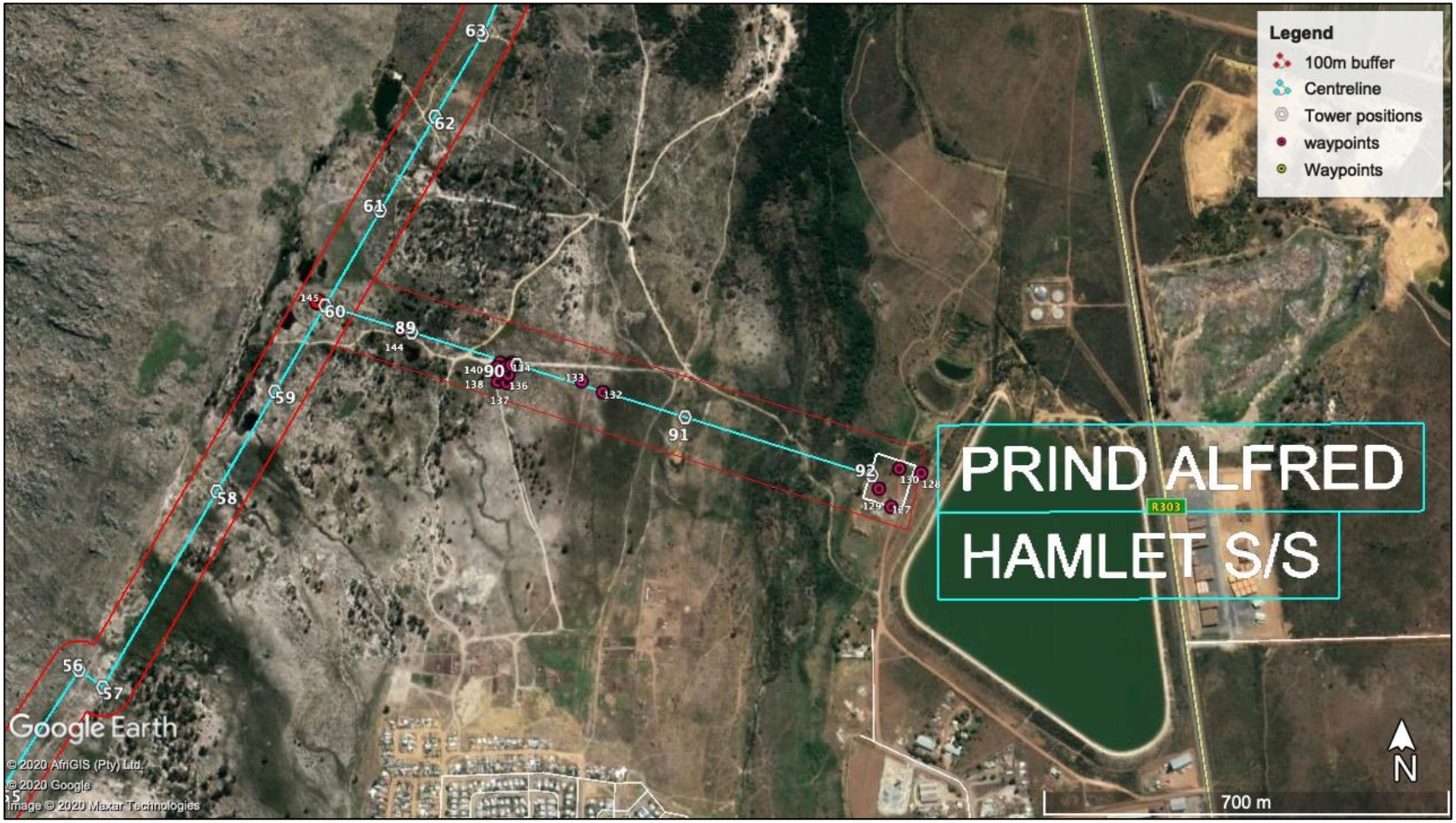


Figure 7.6.1. SURVEY MAP: Google Earth™ aerial image showing 100m corridor (red lines) and the proposed main 132kV powerline (Tower 63 to Tower 56) and Tie-Inn (Tower 89 to Tower 92) (blue line) to the Prince Alfred Hamlet substation (white square). The sample waypoints are indicated (numbered yellow and pink circle icons). Note the position of the north arrow on the rotated image.

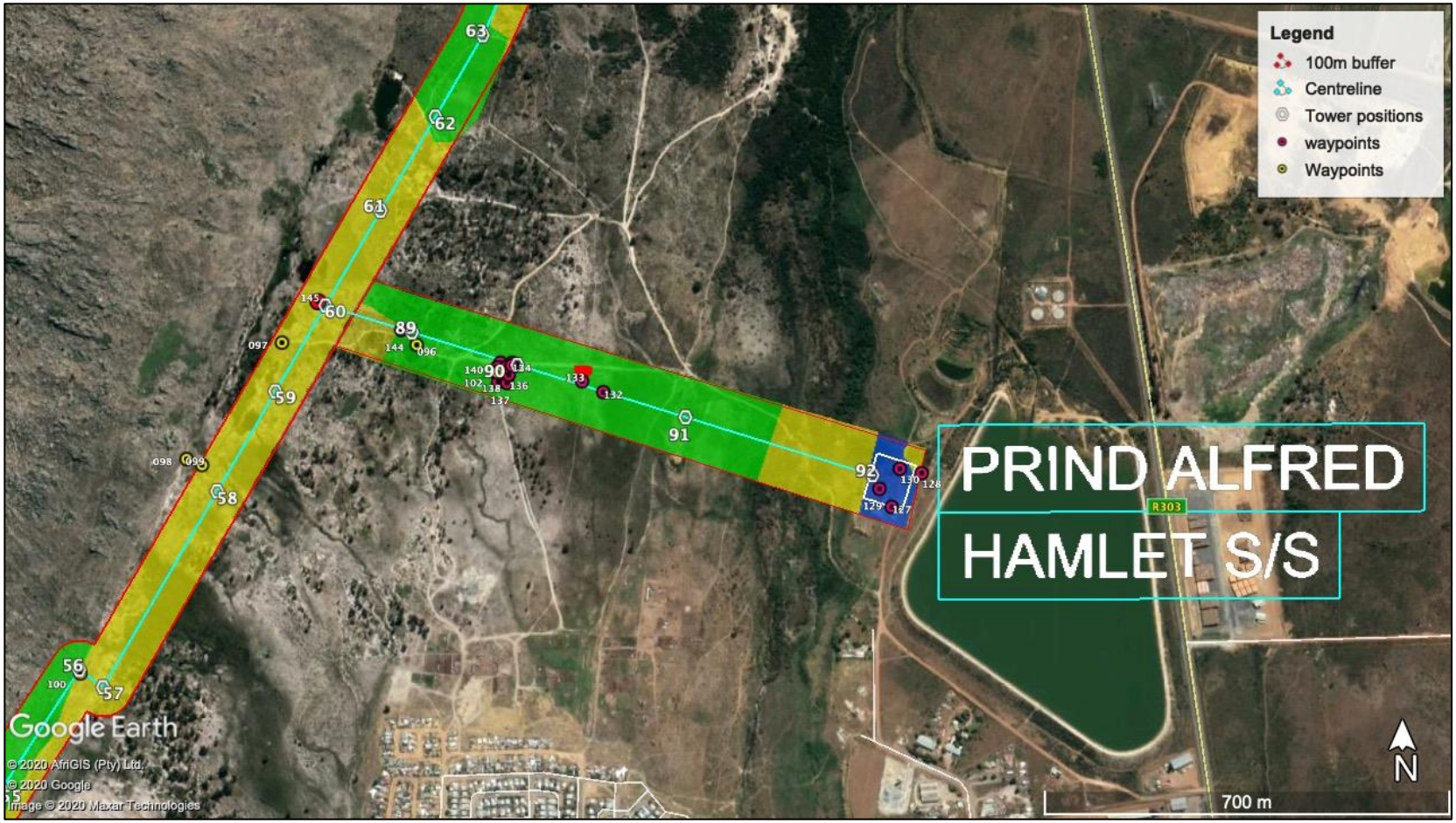


Figure 7.6.2. HABITAT MAP: Google Earth™ aerial image showing 100m corridor (red lines) and the proposed main 132kV powerline (Tower 63 to Tower 56) and Tie-Inn (Tower 89 to Tower 92) (blue line) to the Prince Alfred Hamlet substation (white square). The sample waypoints are indicated (numbered yellow and pink circle icons). The broad habitat types are indicated (green = intact vegetation; yellow = semi-intact vegetation; blue = degraded; red = CRITICALLY ENDANGERED *Leucadendron chamelaea* subpopulation). Note the position of the north arrow on the rotated image.

Figure 7.6.3. SENSITIVITY MAP: Google Earth™ aerial image showing 100m corridor (red lines) and the proposed main 132kV powerline (Tower 63 to Tower 56) and Tie-Inn (Tower 89 to Tower 93) (blue line) to the Prince Alfred Hamlet substation (white square). The sample waypoints are indicated (numbered yellow and pink circle icons). The sensitivity is (orange = medium sensitivity; red = high sensitivity; bright red = very high sensitivity; lime = low sensitivity). Note the position of the north arrow on the rotated image.

Figure 7.6.4. SENSITIVITY MAP (ENLARGED): Google Earth™ aerial image showing an enlarged area of the Prince Alfred Hamlet Tie-In with localities of the CRITICALLY ENDANGERED *Leucadendron chamelaea* (bright red = very high sensitivity).

Illustrations	Affected area
 **Figure 7.7.1.** Continuation of the proposed 132kV powerline along the 100 m corridor showing natural vegetation at right (west) and existing powerline at centre at waypoint 067 (33°17'14.55"S; 19°17'58.38"E).  **Figure 7.7.2.** Natural vegetation transitioning to heavy infestation of alien vegetation at right (west). Pine plantation can be seen on the left-hand side of the existing powerline servitude. View from waypoint 073 (33°17'47.26"S; 19°17'35.09"E).	**PRINCE ALFRED HAMLET SUBSTATION TO CERES SUBSTATION (MOUNTAIN FOOTHILLS OF THE SKURWEBERG AND FARMLAND)** The proposed powerline route continues through patches of semi-intact vegetation and transformed habitat (farmland) south of waypoint 100 (33°16'48.59"S; 19°18'17.52"E)(Tower 56), with a continuous band of intact natural vegetation occurring along the base of the Skurweberg mountain slopes on the western side up to waypoint 074 (33°18'4.48"S; 19°17'23.29"E) (Tower 44). The eastern side of the 100 m corridor varies between semi-intact and transformed habitats. The intact vegetation is dominated by *Anthospermum aethiopicum, Cliffortia ruscifolia, Dodonaea viscosa, Ehrharta ramosa, Heeria argentea, Othonna parviflora, Pentameris* sp*., Stoebe plumosa* and *Rafnia angulata*. Additional species include *Elegia* sp*., Metalasia acuta, Montinia caryophyllacea, Protea laurifolia, Tetraria* sp*.* and *Thesium* sp. A number of wetland seeps/streams were found on the mountain slope. These habitats supports patches of Cape gum (*Metrosideros angustifolia*), found at waypoints 068 (33°17'20.72"S; 19°17'52.96"E) (Tower 51), 069 (33°17'21.71"S; 19°17'51.54"E) and 070 (33°17'23.43"S; 19°17'50.07"E) (Figure 7.8.1). The natural vegetation continues along the western half of the corridor, where it becomes heavily infested with invasive black wattle (*Acacia mearnsii*) and Monterey pine (*Pinus radiata*) between waypoint 073 (33°17'47.26"S; 19°17'35.09"E) (Tower 47) and 074 (33°18'4.48"S; 19°17'23.29"E) (Tower 44). The eastern half of the corridor along this section consists of degraded and transformed habitat (Figure 7.8.2).

Illustrations	**Affected area**
 **Figure 7.7.3.** Servitude access road (centre) with transformed habitat on the left hand side and degraded natural vegetation on the right hand side (west) at waypoint 077 (33°18'22.11"S; 19°17'11.75"E).  **Figure 7.7.4.** The extensive wetland in the vicinity of waypoint 085 (33°19'51.36"S; 19°17'16.15"E) showing tall riverbed grass (*Pennisetum macrourum*).	**PRINCE ALFRED HAMLET SUBSTATION TO CERES SUBSTATION (MOUNTAIN FOOTHILLS AND FLATS)** The route continues south through a complex of transformed, degraded, semi-intact and intact natural vegetation between 074 (33°18'4.48"S; 19°17'23.29"E) (Tower 44) and the Ceres substation. The habitats are indicated in Figure 6.8.2 and 6.8.5. An extensive wetland system that harbours obligate wetland species on either side (north and south) of waypoint 085 (33°19'51.36"S; 19°17'16.15"E) was previously identified and will be avoided by the diversion between Tower 31 and Tower 19 (Figure 6.8.5). The wetland that was flagged includes *Calopsis paniculata, Elegia cuspidata*, *Juncus dregeanus*, *Pennisetum macrourum* and a species in the Orchidaceae family. The diversion between Tower 31 and Tower 19 is Degraded and Transformed. The remainder of the route from Tower 19 until the Ceres Substation contains mostly degraded and semi-intact vegetation.

Figure 7.8.1. SURVEY MAP: Google Earth™ aerial image showing 100m corridor (red lines) and the proposed 132kV powerline (blue line) and Towers 52 to Tower 39 along the main powerline. Note the position of the north arrow on the rotated image.

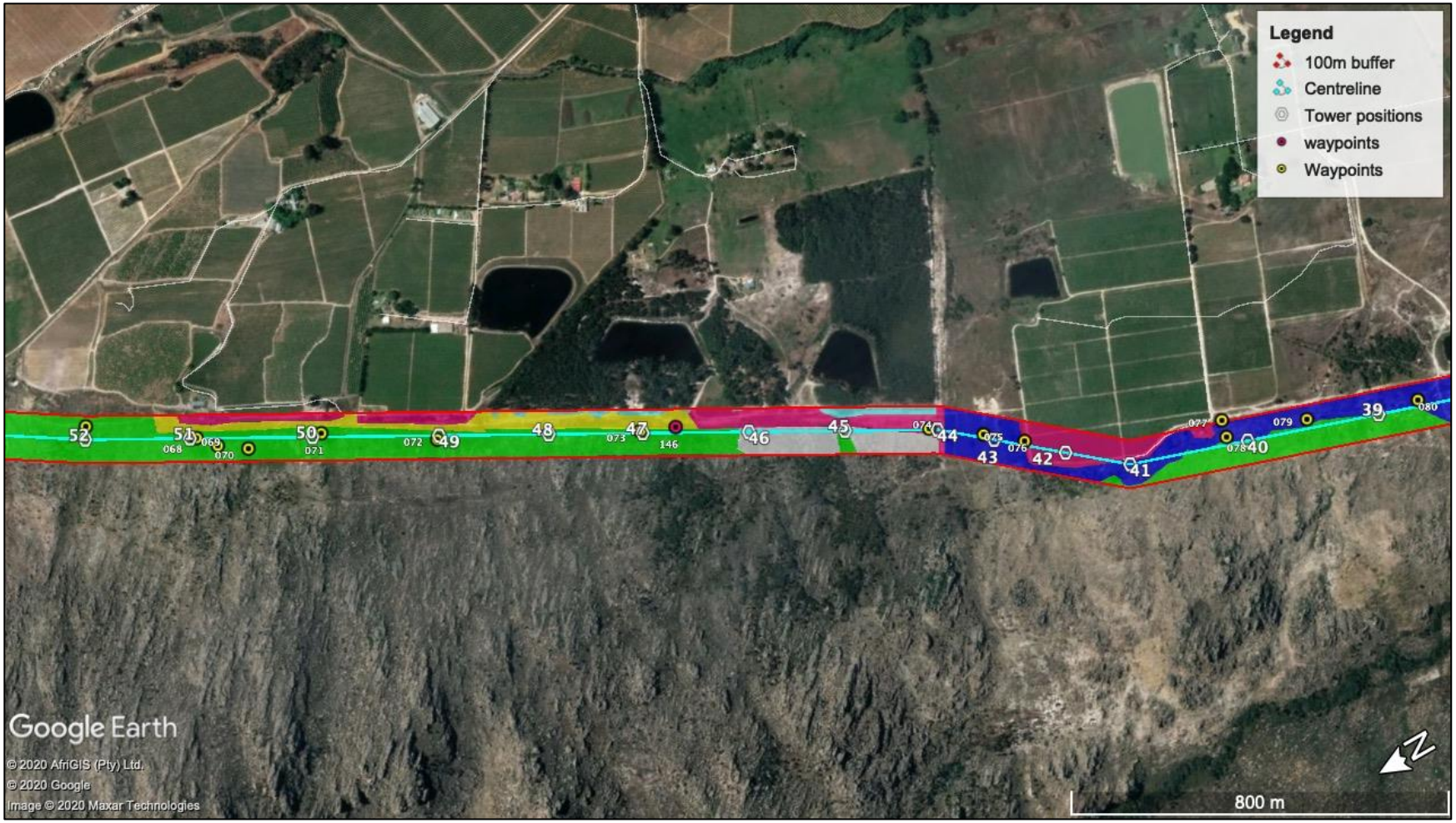


Figure 7.8.2. HABITAT MAP: Google Earth™ aerial image showing 10m corridor (red lines) and the proposed 132kV powerline (blue line), survey waypoints (yellow and pink numbered circle icons) and Towers 52 to Tower 39 along the main powerline. The broad habitat types are indicated (green = intact vegetation; yellow = semi-intact vegetation; dark blue = degraded, light blue = plantation, white = infestations of alien plants, pink = transformed). Note the position of the north arrow on the rotated image.

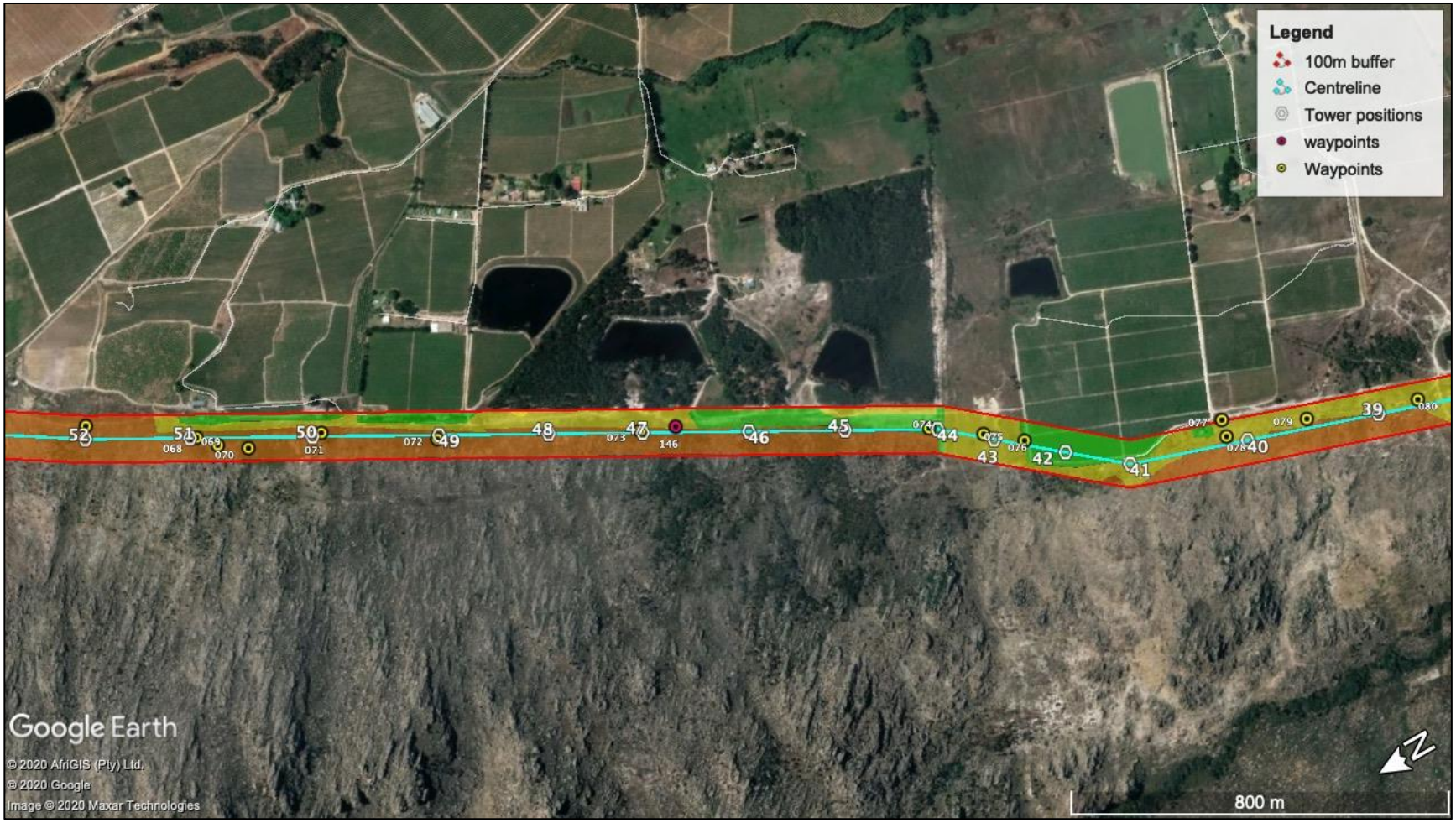


Figure 7.8.3. SENSITIVITY MAP: Google Earth™ aerial image showing 100m corridor (red lines) and the proposed 132kV powerline (blue line), survey waypoints (yellow and pink numbered circle icons) and Towers 52 to Tower 39 along the main powerline. The sensitivity is indicated (orange = medium sensitivity; red = very high sensitivity; yellow = low sensitivity; green = very low sensitivity). Note the position of the north arrow on the rotated image.

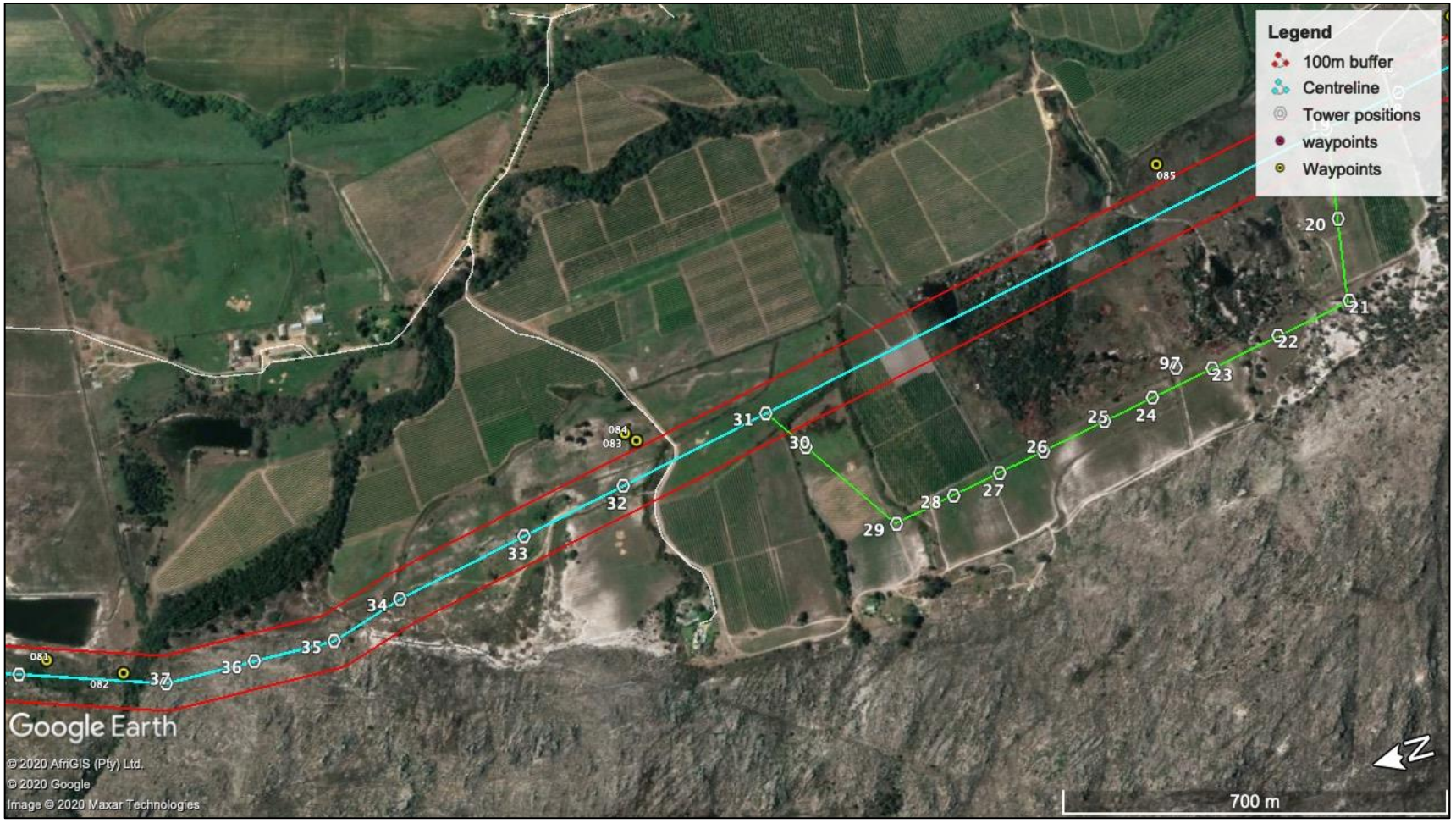


Figure 7.8.4. SURVEY MAP: Google Earth™ aerial image showing 100m corridor (red lines) and the proposed 132kV powerline (blue line) and diversion (green line), survey waypoints (yellow and pink numbered circle icons) and Towers 38 to Tower 20. Note the position of the north arrow on the rotated image.

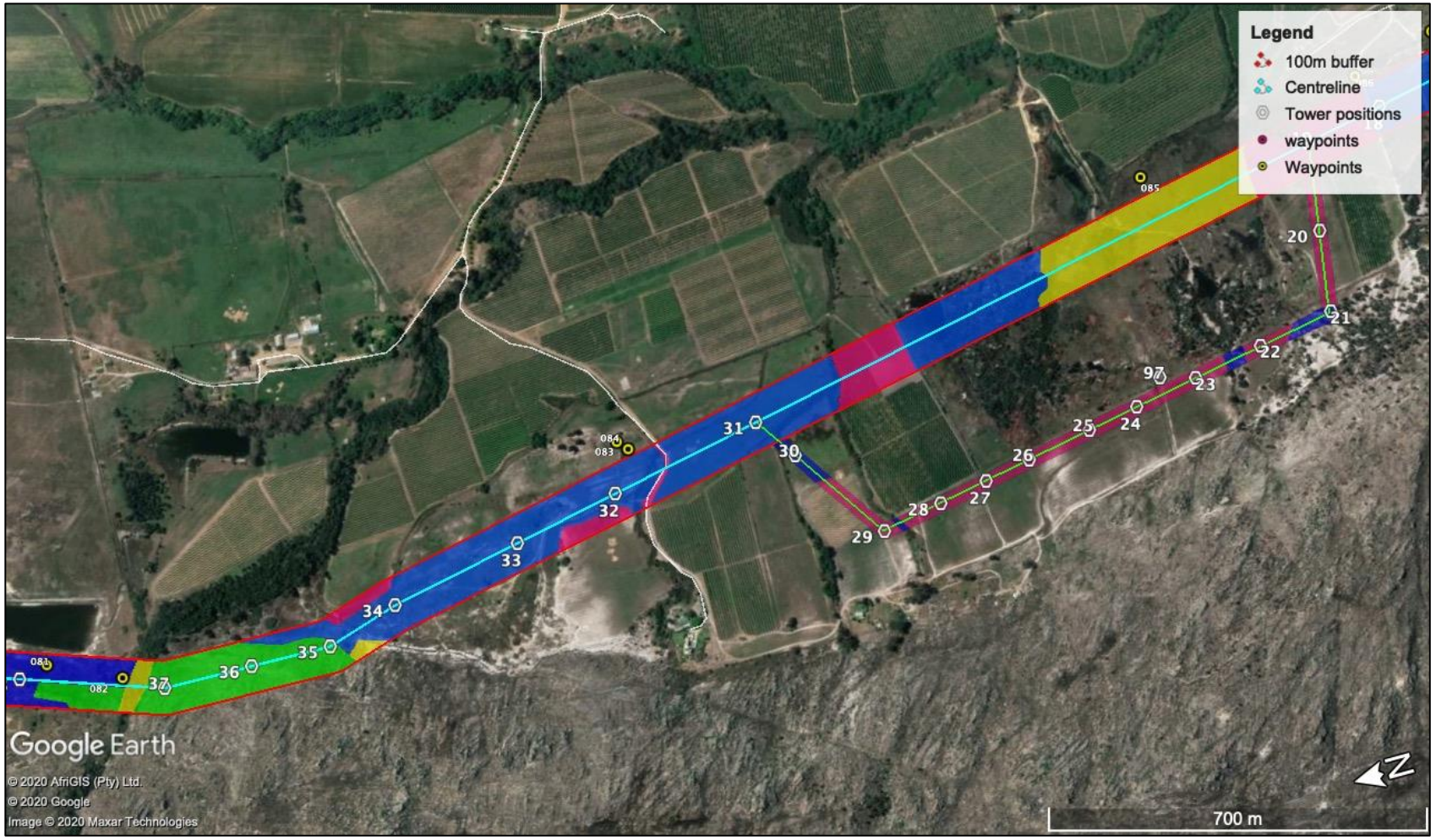


Figure 7.8.5. HABITAT MAP: Google Earth™ aerial image showing 100m corridor (red lines) and the proposed 132kV powerline (blue line), survey waypoints (yellow and pink numbered circle icons) and Towers 38 to Tower 20 along the main powerline. The broad habitat types are indicated (green = intact vegetation; yellow = semi-intact vegetation; dark blue = degraded, light blue = plantation, white = infestations of alien plants, pink = transformed). Note the position of the north arrow on the rotated image.

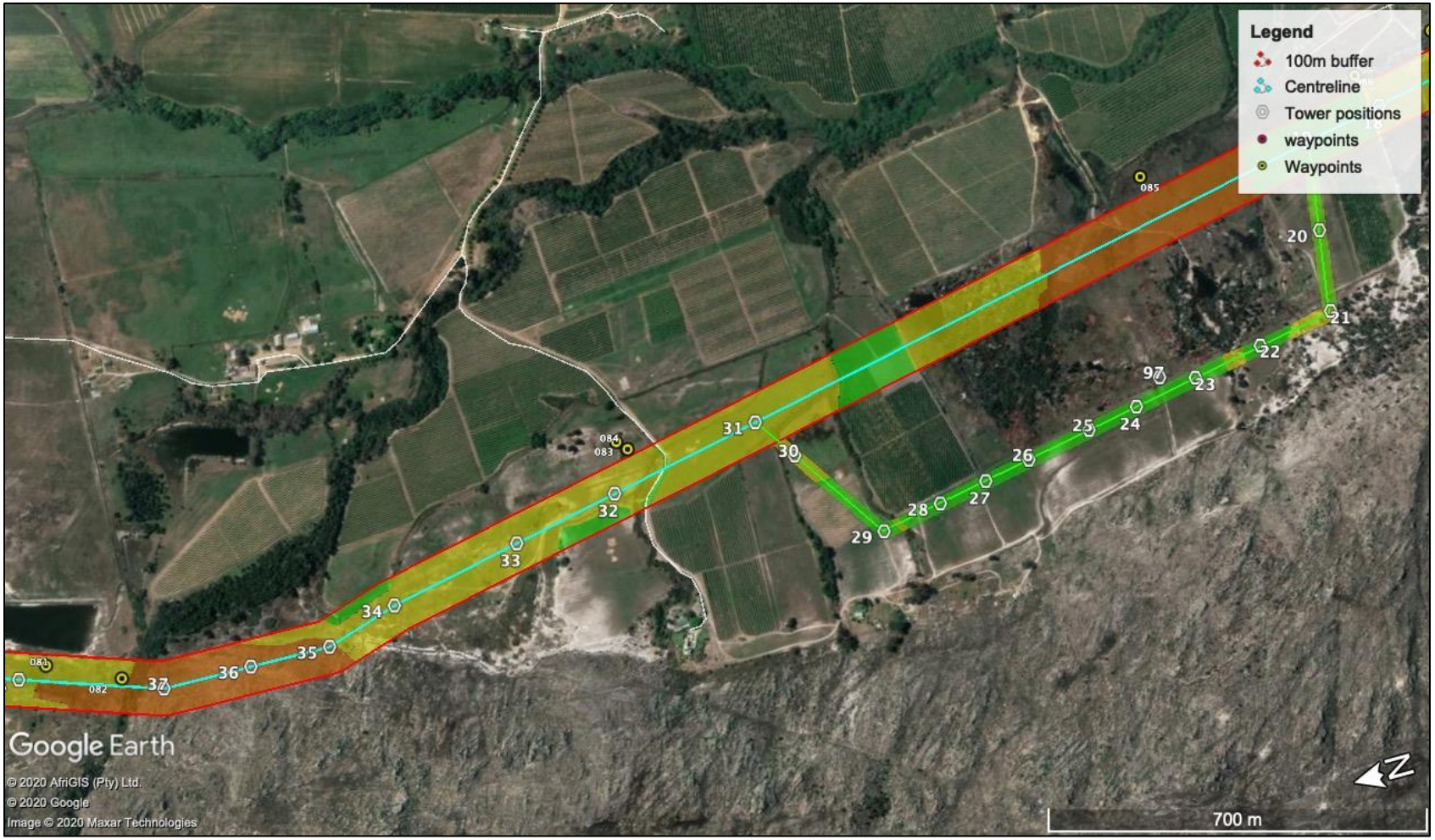


Figure 7.8.6. SENSITIVITY MAP: Google Earth™ aerial image showing 100m corridor (red lines) and the proposed 132kV powerline (blue line), survey waypoints (yellow and pink numbered circle icons) and Towers 38 to Tower 20 along the main powerline. The sensitivity is indicated (orange = moderate sensitivity; red = very high sensitivity; lime = low sensitivity; green = very low sensitivity). Note the position of the north arrow on the rotated image.

Figure 7.8.7. SURVEY MAP: Google Earth™ aerial image showing 100m corridor (red lines) and the proposed 132kV powerline (blue line), survey waypoints (yellow and pink numbered circle icons) and Towers 20 to Tower 1. Note the position of the north arrow on the rotated image.

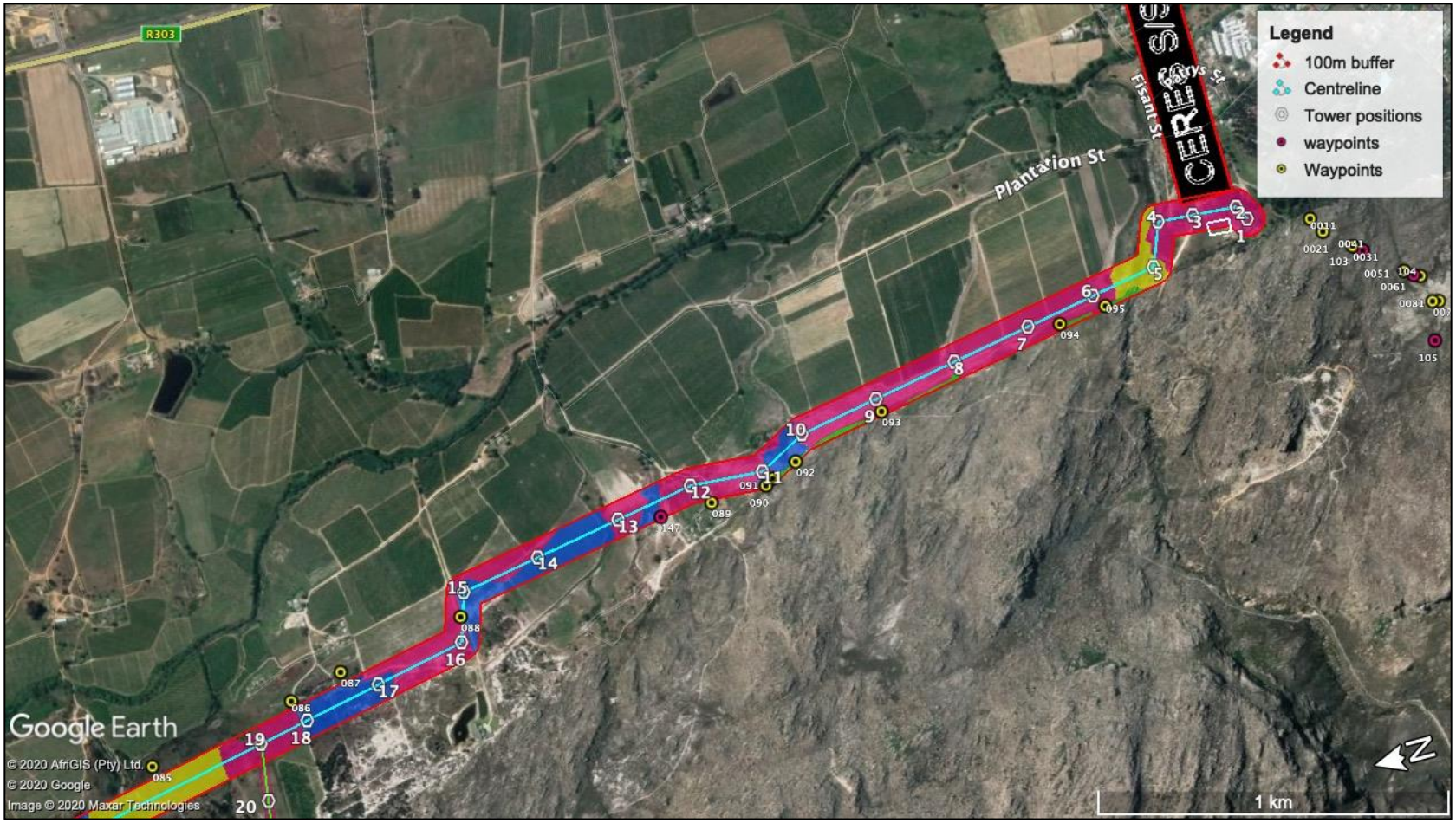


Figure 7.8.8. Google Earth™ aerial image showing 100m corridor (red lines) and the proposed 132kV powerline (blue line), survey waypoints (yellow and pink numbered circle icons) and Towers 20 to Tower 1 along the main powerline. The broad habitat types are indicated (green = intact vegetation; yellow = semi-intact vegetation; dark blue = degraded, light blue = plantation, white = infestations of alien plants, pink = transformed). Note the position of the north arrow on the rotated image.

Figure 7.8.9. SENSITIVITY MAP: Google Earth™ aerial image showing 100m corridor (red lines) and the proposed 132kV powerline (blue line), survey waypoints (yellow and pink numbered circle icons) and Towers 20 to Tower 1 along the main powerline. The sensitivity is indicated (orange = moderate sensitivity; red = very high sensitivity; lime = low sensitivity; green = very low sensitivity). Note the position of the north arrow on the rotated image.

7. IMPACT ASSESSMENT

The impact assessment is a measure of the impacts likely to occur on the affected environment, specifically the vegetation, ecological processes, important species and habitats. They are assessed for (a) the 'No Go' scenario and (b) the direct, indirect and cumulative impacts. Impacts associated with the proposed project are based on (a) the layout plans provided (specific impacts linked to tower positions and access roads), and (b) the impacts associated with each habitat type (general impacts). Mitigation measures are those interventions required to either reduce the impact significance rating (essential mitigation) or to ensure that the project imposes the least possible strain on the affected environment (best practice/general mitigation).

7.1. 'No Go' or No Development Scenario

The 'No Go' or no development scenario takes into consideration the impact should development not occur. It is a prediction of the future state of the affected area in the event of no development taking place based on the current and/or anticipated future land use. If the proposed construction of the powerline does not occur it would not affect the *status quo* of the natural vegetation. The 'No Go' scenario would thus result in a **Neutral** impact since no natural vegetation would be lost or fragmented.

7.2. Direct impacts

Direct impacts are those that would occur as a direct result of the proposed construction and operational activities of the project. These would include the following:

- Loss of vegetation type, important species and ecological processes resulting from the construction of pylons.
- Loss of vegetation due to temporary access tracks (i.e. areas traversed by large trucks with possible brush-cutting of vegetation).
- Loss of vegetation within the servitude due to Eskom's vegetation management plan, as follows:
    - Brush-cutting of vegetation where the vegetation poses a safety clearance risk.
    - Brush-cutting or clearing of vegetation when access to the Eskom land is hindered.

  - Brush-cutting or pruning of vegetation where vegetation poses a fire risk.
  - To comply with legal imperatives.
- Introduction of weeds and invasive alien plants (IAP's) via disturbance and introduction of seed present in gravel and other introduced material, including seed transported in vehicles and by humans.
- Gradual spread of IAP's along new access roads.
- Spread of IAPs into Protected Areas and CBAs from new access roads. It is noted that new access roads may, however, assist alien clearing efforts and fire-fighting efforts. Thus, impacts are likely to be both negative and positive in some instances.

Direct impacts are assessed in Table 5 to 8 according to the following interrelated components:

- Loss of vegetation type – including intact vegetation, ecologically important species and species of conservation concern.
- Loss of ecological processes – associated with fragmentation and loss of intact vegetation, and loss of ecologically important species and species of conservation concern.

CONSTRUCTION PHASE

Loss of vegetation was calculated for each vegetation type and habitat condition class (intact vegetation, semi-intact vegetation, degraded vegetation and transformed) for all construction activities, namely (a) tower construction and (b) access road construction (Table 4). These were assessed in terms of the extent (clearance of vegetation required) in relation to habitat sensitivity based on vegetation type, ecological processes, and important species (Tables 5 to 8). Note that when assessing impacts relating to tower construction and access road construction, the highest impact rating is applied in order to rate the overall impact significance. For example, if loss of vegetation is Low Negative for tower construction but Medium Negative for access road construction, the latter rating is applied since this allows for assessing the impacts significance for the powerline activities as an overall impact.

Loss of vegetation type and important species

Loss of vegetation type and important species is expected to result in the following impact significance <u>prior to mitigation</u>:

Tower construction

Ceres Shale Renosterveld: **High Negative Impact.**

Winterhoek Sandstone Fynbos: **High Negative Impact.**

Access road construction

Ceres Shale Renosterveld: **Low Negative Impact.**

Winterhoek Sandstone Fynbos: **Medium Negative Impact.**

Overall impacts

Ceres Shale Renosterveld: **High Negative Impact.**

Winterhoek Sandstone Fynbos: **High Negative Impact.**

One **species of conservation concern** occurs in the vicinity of the Prince Alfred Hamlet Tie-inn. The **Critically Endangered Witsenberg conebush (*Leucadendron chamelaea*)** occurs from the Kouebokkeveld to Franshoek. The threats are summarized in The Red List of South African Plants: "*This species' habitat has been severely reduced by cultivation of fruit vineyards, potatoes and other cash crops. It has lost at least 50% of its habitat, and 5% was lost between 1990 and 2014. Remaining subpopulations are now confined to road verges and small fragments where they are threatened by a lack of fire, alien invasive plants and road verge clearing. Agricultural pest control has also caused a decline in some subpopulations"* (sanbi.redlist.org).

The localities of the species are indicated in Section 7 (waypoint 096: 33°16'30.25"S; 19°18'39.96"E, waypoint 133:33°16'32.28"S; 19°18'50.99"E and high numbers in the vicinity of 102 :33°16'31.77"S; 19°18'45.32"E). During a micro-siting exercise with Eskom these localities were flagged. Tower 89 and Tower 90 are located within 10 m of several individuals (see Figure 6.6.4). Due to the dynamic nature of plant species, a survey of the tie in portion (between Tower 60 and Tower 92) must be undertaken by a botanical specialist no longer than 6 months prior to construction to confirm the extent of the *Leucadendron chamelaea* subpopulation. The subpopulation and outlying individuals must be mapped with the ECO and Eskom after the survey. The survey should include checking the status quo of the known localities at waypoint 096: 33°16'30.25"S; 19°18'39.96"E, waypoint 133: 33°16'32.28"S; 19°18'50.99"E and high numbers in the vicinity of 102 :33°16'31.77"S; 19°18'45.32"E). These points were previously

flagged during a micro-siting exercise with Eskom. Tower 89 and Tower 90 are located within 10 m of several individuals. If the mitigation measure, including *inter alia* the survey, are not implemented prior to and during construction there is a high probability that several individuals would be lost. Thus, impacts are potentially High negative prior to mitigation.

Loss of ecological processes

Loss of ecological processes associated with loss of vegetation type and important species is difficult to quantify, however, the main impacts are likely to result in habitat fragmentation and impeded flow of ecological process as a result of the construction of new access roads. These impacts are unlikely to have far reaching ecological impacts. Impacts due to loss of ecological processes was rated on the same order of magnitude as loss of vegetation type and important species (i.e. precautionary approach). These are expected to result in the following impact significance prior to mitigation:

Tower construction

Ceres Shale Renosterveld: **High Negative Impact.**

Winterhoek Sandstone Fynbos: **Low Negative Impact.**

Access road construction

Ceres Shale Renosterveld: **Low Negative Impact.**

Winterhoek Sandstone Fynbos: **Medium Negative Impact.**

Overall impacts

Ceres Shale Renosterveld: **High Negative Impact.**

Winterhoek Sandstone Fynbos: **Medium Negative Impact.**

Table 4. Loss of vegetation that would result from construction of tower and access road construction for each vegetation type and habitat condition class

Vegetation type	**Access roads: intact vegetation**	**Access roads: degraded vegetation**	**Access roads: transformed vegetation**	**Access roads: semi-intact vegetation**	**Pylons: intact vegetation**	**Pylons: degraded vegetation**	**Pylons: semi-intact vegetation**	**Pylons: transformed**
Ceres Shale Renosterveld	None	None	None	None	1 x 200m^2 =200 m^2	1 x 200m^2 =200 m^2	5 x 200m^2 =1000 m^2	4 x 200m^2 =800 m^2

Subtotal					**200 m²**	**200 m²**	**1000 m²**	**800 m²**
Winterhoek Sandstone Fynbos	None	None	None	None	36 x 200 m² = 7200 m²	12 x 200 m² = 2400 m²	8 x 200 m² = 1600 m²	26 x 200 m² = 5200 m²
Subtotal					**7200 m²**	**2400 m²**	**1600m²**	**5200 m²**

Table 5A. Impact and Significance - Loss of vegetation type (Ceres Shale Renosterveld: VULNERABLE) and important species during the construction phase.

CRITERIA	'NO GO' ALTERNATIVE		TOWERS (PYLONS)	
Nature of direct impact	**Neutral**		**-ve**	
Loss of vegetation type & important species				
	WITHOUT MITIGATION	WITH MITIGATION	WITHOUT MITIGATION	WITH MITIGATION
Extent (A)	Local (1)	Local (1)	Local (1)	Local (1)
Intensity (B)	None (0)	None (0)	High (3)	Low (1)
Duration (C)	None (0)	None (0)	Long-term (3)	Long-term (3)
Consequence score: (A + B + C)	1	1	7	5
Consequence rating	Not significant	Not significant	High	Low
Probability of occurrence	Definite	Definite	Probable	Probable
Confidence	High	High	High	High
Significance	Not significant	Not significant	High	Low
Proposed mitigation: A botanical specialist must undertake a survey of the tie in portion of the powerline (i.e. between tower 60 and Tower 92) to confirm and map the location of the Critically Endangered Witsenberg conebush (*Leucadendron chamelaea)* no longer than 6 months before construction. No impacts to Critically Endangered Witsenberg conebush (*Leucadendron chamelaea)* must occur. An ECO should be present during construction of these towers and mark-off the Witsenberg conebush subpopulations.				
Nature of Cumulative impact Note cumulative impacts are calculated in relation to the remaining natural or near-natural vegetation of each vegetation type or ecosystem (see section 7.4).	**Neutral**		**-ve**	
Cumulative impact prior to mitigation	No Impact	No Impact	Low	Low
Degree to which impact can be reversed	High	High	Irreversible	Irreversible

Degree to which impact may cause irreplaceable loss of resources	No Impact	No Impact	Low	Low
Degree to which impact can be mitigated	No Impact	No Impact	Medium	Medium
Proposed mitigation	None	None	See above	See above
Cumulative impact post mitigation	No Impact	No Impact	Very Low	Very Low
Significance of cumulative impact (broad scale) after mitigation	No Impact	No Impact	Very Low	Very Low

Table 5B. Impact and Significance - Loss of vegetation type (Winterhoek Sandstone Fynbos: Least Threatened) and important species during the construction phase.

CRITERIA	'NO GO' ALTERNATIVE		TOWERS (PYLONS)	
Nature of direct impact	**Neutral**		**-ve**	
Loss of vegetation type & important species				
	WITHOUT MITIGATION	WITH MITIGATION	WITHOUT MITIGATION	WITH MITIGATION
Extent (A)	Local (1)	Local (1)	Local (1)	Local (1)
Intensity (B)	None (0)	None (0)	High (3)	Low (1)
Duration (C)	None (0)	None (0)	Long-term (3)	Long-term (3)
Consequence score: (A + B + C)	1	1	7	5
Consequence rating	Not significant	Not significant	High	Low
Probability of occurrence	Definite	Definite	Probable	Probable
Confidence	High	High	High	High
Significance	Not significant	Not significant	High	Low
Proposed mitigation: No access roads between Towers 67 to 88. Use existing access tracks and helicopter access. A botanical specialist must undertake a survey of the tie in portion of the powerline (i.e. between tower 60 and Tower 92) to confirm and map the location of the Critically Endangered Witsenberg conebush (*Leucadendron chamelaea)* no longer than 6 months before construction. No impacts to Critically Endangered Witsenberg conebush (*Leucadendron chamelaea)* near Tower 89 must occur. An ECO should be present during construction of these towers and mark-off the Witsenberg conebush subpopulations. An ECO must be present during the construction of Towers between Tower 67 to 88.				
Nature of Cumulative impact Note cumulative impacts are calculated in relation to the remaining natural or near-natural vegetation of each vegetation type or ecosystem (see section 7.4).	**Neutral**		**-ve**	

Cumulative impact prior to mitigation	No Impact	No Impact	Low	Low
Degree to which impact can be reversed	High	High	Irreversible	Irreversible
Degree to which impact may cause irreplaceable loss of resources	No Impact	No Impact	Low	Low
Degree to which impact can be mitigated	No Impact	No Impact	Medium	Medium
Proposed mitigation	None	None	See above	See above
Cumulative impact post mitigation	No Impact	No Impact	Very Low	Very Low
Significance of cumulative impact (broad scale) after mitigation	No Impact	No Impact	Very Low	Very Low

OPERATIONAL PHASE

Loss of vegetation will occur during the operational phase as a result of vegetation maintenance beneath the powerlines as part of Eskom's vegetation maintenance protocols. Impacts due to brush cutting of vegetation at a low height on a regular basis and for an extended period can have a severe impact on vegetation communities and species. Impacts generally become more severe the lower the vegetation is cut and with an increase in duration. A once-off brush-cutting event may allow for natural recovery and no change is species abundance and diversity but as the frequency increases certain species are lost and others become dominant, thus changing the community composition. This can be highly detrimental and has the added impacts of allowing weedy and invasive species to colonize wilderness areas. Impacts due to brush cutting (i.e. maintenance) appear in Tables 6A and 6B.

Table 6A. Impact and Significance - Loss of vegetation type (Ceres Shale Renosterveld: VULNERABLE) and important species during the operational phase phase.

CRITERIA	'NO GO' ALTERNATIVE		BRUSH-CUTTING	
Nature of direct impact	**Neutral**		**-ve**	
Loss of vegetation type & important species				
	WITHOUT MITIGATION	WITH MITIGATION	WITHOUT MITIGATION	WITH MITIGATION
Extent (A)	Local (1)	Local (1)	Local (1)	Local (1)
Intensity (B)	None (0)	None (0)	Low (1)	Low (1)
Duration (C)	None (0)	None (0)	Long-term (3)	Long-term (3)
Consequence score: (A + B + C)	1	1	5	5
Consequence rating	Not significant	Not significant	Low	Low
Probability of occurrence	Definite	Definite	Probable	Probable
Confidence	High	High	High	High
Significance	Not significant	Not significant	Low	Low
MITIGATION: A vegetation management plan must be compiled in consultation with CapeNature. This must be specifically tailored to the affected vegetation.				
Nature of Cumulative impact Note cumulative impacts are calculated in relation to the remaining natural or near-natural vegetation of each vegetation type or ecosystem (see section 7.4).	**Neutral**		**-ve**	
Cumulative impact prior to mitigation	No Impact	No Impact	Low	Low
Degree to which impact can be reversed	High	High	Irreversible	Irreversible

Degree to which impact may cause irreplaceable loss of resources	No Impact	No Impact	Low	Low
Degree to which impact can be mitigated	No Impact	No Impact	Medium	Medium
Proposed mitigation	None	None	See above	See above
Cumulative impact post mitigation	No Impact	No Impact	Very Low	Very Low
Significance of cumulative impact (broad scale) after mitigation	No Impact	No Impact	Low	Very Low

Table 6B. Impact and Significance - Loss of vegetation type (WITZENBERG SANDSTONE FYNBOS) and important species during the operational phase phase.

CRITERIA	**'NO GO' ALTERNATIVE**		**BRUSH-CUTTING**	
Nature of direct impact	**Neutral**		**-ve**	
Loss of vegetation type & important species				
	WITHOUT MITIGATION	WITH MITIGATION	WITHOUT MITIGATION	WITH MITIGATION
Extent (A)	Local (1)	Local (1)	Local (1)	Local (1)
Intensity (B)	None (0)	None (0)	High (3)	Medium (2)
Duration (C)	None (0)	None (0)	Long-term (3)	Long-term (3)
Consequence score: (A + B + C)	1	1	7	6
Consequence rating	Not significant	Not significant	High	Medium
Probability of occurrence	Definite	Definite	Probable	Probable
Confidence	High	High	High	High

Significance	Not significant	Not significant	Low	Low
MITIGATION: A vegetation management plan must be compiled in consultation with CapeNature. This must be specifically tailored to the affected vegetation.				
Nature of Cumulative impact Note cumulative impacts are calculated in relation to the remaining natural or near-natural vegetation of each vegetation type or ecosystem (see section 7.4).	**Neutral**		**-ve**	
Cumulative impact prior to mitigation	No Impact	No Impact	Low	Low
Degree to which impact can be reversed	High	High	Irreversible	Irreversible
Degree to which impact may cause irreplaceable loss of resources	No Impact	No Impact	Low	Low
Degree to which impact can be mitigated	No Impact	No Impact	Medium	Medium
Proposed mitigation	None	None	See above	See above
Cumulative impact post mitigation	No Impact	No Impact	Low	Low
Significance of cumulative impact (broad scale) after mitigation	No Impact	No Impact	Low	Very Low

Loss of vegetation type and important species

Loss of vegetation type and important species is expected to result in the following impact significance prior to mitigation:

Brush-cutting

Ceres Shale Renosterveld: **Low Negative Impact.**

Winterhoek Sandstone Fynbos: **High Negative Impact.**

Overall impacts

Ceres Shale Renosterveld: **Low Negative Impact.**

Winterhoek Sandstone Fynbos: **High Negative Impact.**

7.3 Mitigation

7.3.1. Site-specific mitigation

Loss of vegetation can be minimized in two ways. Firstly, by reducing the extent, number and type of access roads and secondly by minimizing the construction area at towers by reducing unnecessary blasting and dumping of excavated rock. Excess material should be removed from each construction site since this smothers and kills the vegetation (Figure 8). In some instances, the need for access roads could be eliminated by helicopter assisted access. This would only be necessary between the Tower 88 and Tower 67. According to Eskom, the feasibility of the project becomes increasingly compromised as the number of constructed towers requiring helicopter assistance increases. It was therefore necessary to identify the most sensitive areas requiring helicopter assistance during the scoping and walk-through phases of the project. Mitigation is thus limited in many cases since loss of vegetation cannot be reduced by eliminating the need for access roads along all sections of the powerline route. The following site-specific mitigation measures were included:

Witzenberg Substation to Prince Alfred Hamlet

- No access roads must be constructed between Towers 67 to 88. Use of existing access tracks and existing helicopter access must be employed. Eskom have confirmed that Towers 67 to 88 will only be accessed by helicopter. This mitigation was agreed upon after

the micro-citing exercise and would reduce impacts imposed by access roads in this mountainous area from Medium to Low Negative.

- An ECO must be present during the construction of Towers between Tower 61 to 88.
- The mountain section between the Witzenberg Substation and Tower 69 is a Protected Area and thus any footprint must be minimized as far as possible.

Prince Alfred Hamlet Tie-in

- A survey of the tie in portion (between Tower 60 and Tower 92) must be undertaken by a botanical specialist no longer than 6 months prior to construction to confirm the extent of the *Leucadendron chamelaea* subpopulation. The subpopulation and outlying individuals must be mapped with the ECO and Eskom after the survey. The survey should include checking the status quo of the known localities at waypoint 096: 33°16'30.25"S; 19°18'39.96"E, waypoint 133: 33°16'32.28"S; 19°18'50.99"E and high numbers in the vicinity of 102: 33°16'31.77"S; 19°18'45.32"E. These points were previously flagged during a micro-siting exercise with Eskom, as being located within very close proximity of of several individuals.
- No impacts to Critically Endangered Witsenberg conebush (*Leucadendron chamelaea)* near Tower 89 must occur. An ECO should be present during construction of these towers and mark-off the Witsenberg conebush subpopulations.

Prince Alfred Hamlet to Ceres Substation

- No new access roads may be constructed. All towers must be accessed from the existing road network. No new access roads should be constructed through intact vegetation along the base of the Skurweberg section (Tower 61 to Tower 44).

Figure 8. Piles of excavated rock smothering natural vegetation next to a pylon (tower) results in long-term loss of vegetation. Such events should be avoided by removing the material from the site.

7.3.2. General mitigation during the construction phase

General mitigation during the construction phase should include the following:

- The construction phase should be monitored by the Environmental Control Officer (ECO) so that no damage occurs to adjacent vegetation falling outside the intended construction area.
- Permanent access roads could potentially be eliminated in areas where construction vehicles could access construction site as a 'once-off'. Access during emergency maintenance and repairs could potentially be via temporary access. However, the merits of eliminating the need for permanent access must be considered on a case by case basis. Eskom require that each structure be inspected at least annually. They motivate that by formalizing access tracks this prevents impacts spreading wider than the initial footprint, however, once roads are constructed they tend be neglected and can lead to severe and irreversible erosion.

7.3.3. General mitigation during the operational phase

General mitigation during the operational phase should include the following:

- Focused IAP eradication, management and monitoring along access roads where IAPs are likely to spread. Note that IAP eradication is not technically mitigation since it is a legal requirement.
- A vegetation management plan should be compiled in consultation with CapeNature and incorporated into the Environmental Management Plan (EMP). Note that According the Department of Environmental Affairs and Development Planning (DEA&DP) Guideline for Environmental Management Plans (2005) an EMP can be defined as "*an environmental management tool used to ensure that undue or reasonably avoidable adverse impacts of the construction, operation and decommissioning of a project are prevented; and that the positive benefits of the projects are enhanced". EMPs are therefore important tools for ensuring that the management actions arising from Environmental Impact Assessment (EIA) processes are clearly defined and implemented through all phases of the project life-cycle."* This management plan should be constantly refined and tailored for each veld type and veld age.

8. CONCLUSIONS AND RECOMMENDATIONS

The proposed 132kV powerline from Witzenberg Substation to Ceres Substation (and Prince Allred's Hamlet Tie-in) would result in a number of impacts, of which the most severe include (a) the construction of towers during the construction phase, and (b) brush-cutting of vegetation during the operational phase. No new access roads will be constructed, which will reduce overall impacts of the project significantly (from Medium to Low Negative). Individual towers generally have a low impact owing to the small footprint area and ability of natural vegetation to recover in the long-term, whereas access roads are permanent and can lead to substantial loss of vegetation and critical ecosystems (terrestrial and wetland). Brush-cutting is not as severe as the construction of access roads but can have permanent, or at least very long-lasting impacts.

The scoping phase of the project was crucial in screening out 'No Go' areas where impacts where deemed unacceptable from a botanical, wetland, heritage and visual perspective, and has played an important role in reducing impacts of the project to acceptable levels. Most critically, access roads will be eliminated by helicopter assisted access and temporary access to towers for

maintenance and emergency repairs. The two most important areas where impacts would potentially be High Negative without mitigation are:

1. The mountain section between Tower 86 and 67. Access roads were previously planned for this section but owing to the severity of the impacts that would be imposed along this mountainous section Eskom has confirmed that Towers 88 to 67 will only be accessed via helicopter. This area was flagged during the screening process as a No-Go for access roads. Impacts after mitigation are likely to be Low negative under this scenario.
2. A survey of the tie in portion (between Tower 60 and Tower 92) must be undertaken by a botanical specialist no longer than 6 months prior to construction to confirm the extent of the *Leucadendron chamelaea* subpopulation. The subpopulation and outlying individuals must be mapped with the ECO and Eskom after the survey. The survey should include checking the status quo of the known localities at waypoint 096: 33°16'30.25"S; 19°18'39.96"E, waypoint 133: 33°16'32.28"S; 19°18'50.99"E and high numbers in the vicinity of 102 :33°16'31.77"S; 19°18'45.32"E). These points were previously flagged during a micro-siting exercise with Eskom. Tower 89 and Tower 90 are located within 10 m of several individuals.
3. The presence of the Critically Endangered Witsenberg conebush (*Leucadendron chamelaea)* near Tower 89 and Tower 90 (within 10 m of each tower). No impacts must be imposed at these subpopulations and individual plants identified during the survey conducted prior to construction and an ECO should be present during construction of these towers to ensure mitigation measures are implemented. The subpopulation must also be marked with danger tape.

The remainder of the route can be accessed via existing access roads and would lead to a Low Negative impact, provided no new access roads are constructed through intact vegetation along the base of the Skurweberg section (Tower 61 to Tower 44).

General mitigation should include the following:

- Focused IAP eradication, management and monitoring along access roads where IAP are likely to spread. Note that this is not technically mitigation since invasive species must be controlled as part of Eskom’s legal obligations.
- The construction phase should be monitored by the Environmental Control Officer (ECO) so that no damage occurs to adjacent vegetation falling outside the intended construction area.

- Permanent access roads could potentially be eliminated in areas where construction vehicles could access construction site as a 'once-off'. Access during emergency maintenance and repairs could potentially be via temporary access.
- A vegetation management plan must be developed in consultation with CapeNature to be incorporated into the EMPr.

In terms of the updated National Environmental Management Act (Act 107 of 1998, as amended) 2014 EIA regulations, Appendix 3 Section 3(q), all specialist reports must include *"a reasoned opinion as to whether the proposed activity should or should not be authorized and if the opinion is that it should be authorized, any conditions that should be made in respect of that authorization".* It is worth mentioning that opinion statements are prone to bias and should be critically evaluated by the competent authority as well as interested and affected parties. It is my opinion that the proposed project should only be authorized provide that that specific and general mitigation measures are followed.

9. REFERENCES

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APPENDIX 1: ASSESSMENT METHODOLOGY

For each impact, the **nature** (positive/negative), **extent** (spatial scale), **magnitude/intensity** (intensity scale), **duration** (time scale), **consequence** (calculated numerically) and **probability** of occurrence is ranked and described. These criteria would be used to ascertain the **significance** of the impact, firstly in the case of no mitigation and then with the most effective mitigation measure(s) in place.
The tables below show the rankings of these variables, and defines each of the rating categories.

Table 2: Assessment criteria for the evaluation of impacts

CRITERIA	RANK	DESCRIPTION
Nature	**Positive (+)**	The environment will be positively affected.
	Negative (-)	The environment will be negatively affected.
Extent or spatial influence of impact	**National (4)**	Beyond provincial boundaries, but within national boundaries.
	Regional (3)	Beyond a 10 km radius of the proposed activities, but within provincial boundaries.
	Local (2)	Within a 10 km radius of the proposed activities.
	Site specific (1)	On site or within 100 m of the proposed activities.
	Zero (0)	Zero extent.
Magnitude/ intensity of impact (at the indicated spatial scale)	**High (3)**	Natural and/ or social functions and/ or processes are *severely* altered.
	Medium (2)	Natural and/ or social functions and/ or processes are *notably* altered.
	Low (1)	Natural and/ or social functions and/ or processes are *slightly* altered.
	Zero (0)	Natural and/ or social functions and/ or processes remain *unaltered.*
Duration of impact	**Long Term (3)**	More than 10 years, but impact ceases after the operational phase.
	Medium Term (2)	Between 3 – 10 years.
	Short Term (1)	Construction period (up to 3 years).
	None (0)	Zero duration.

Consequence (Nature x (Extent + Magnitude/ Intensity + Duration))	**Extremely beneficial/ detrimental (10 – 11) (+/-)**	The impact is *extremely* beneficial/ detrimental.
	Highly beneficial/ detrimental (8 – 9) (+/-)	The impact is *highly* beneficial/ detrimental.
	Moderately beneficial/ detrimental (6 – 7) (+/-)	The impact is *moderately* beneficial/ detrimental.
	Slightly beneficial/ detrimental (4 – 5) (+/-)	The impact is *slightly* beneficial/ detrimental.
	Negligibly beneficial/ detrimental (1 – 3) (+/-)	The impact is *negligibly* beneficial/ detrimental.
	Zero consequence (0) (+/-)	The impact has zero consequence.
Probability of occurrence	**Definite (4)**	Estimated at a greater than 95% chance of the impact occurring.
	Probable (3)	Estimated 50 – 95% chance of the impact occurring.
	Possible (2)	Estimated 6 – 49% chance of the impact occurring.
	Unlikely (1)	Estimated less than 5% chance of the impact occurring.
	None (0)	Estimated no chance of impact occurring.

The **significance** of an impact is derived by taking into account the **consequence** (nature of the impact and its extent, magnitude/intensity and duration) of the impact and the **probability** of this impact occurring through the use of the following formula:

Significance Score = Consequence x Probability

The means of arriving at a significance rating is explained in Table 3.

Table 3: Definition of significance ratings

SIGNIFICANCE SCORE	SIGNIFICANCE RATINGS

32 – 40	**High (+)**	**High (-)**
25 – 31	**Medium (+)**	**Medium (-)**
19 – 24	**Low (+)**	**Low (-)**
10 – 18	**Very-Low (+)**	**Very-Low (-)**
1 – 9	**Negligible**	

Once the significance of an impact has been determined, the **confidence** in the assessment of the impact, as well as the degree of **reversibility** of the impact and **irreplaceable loss of resources** would be determined using the rating systems outlined in Table 4, 5 and 6 respectively. Lastly, the **cumulative impact** is ranked and described as outlined in Table 7.

Table 4: Definition of confidence ratings

CONFIDENCE RATINGS	CRITERIA
High	Wealth of information on and sound understanding of the environmental factors potentially influencing the impact.
Medium	Reasonable amount of useful information on and relatively sound understanding of the environmental factors potentially influencing the impact.
Low	Limited useful information on and understanding of the environmental factors potentially influencing this impact.

Table 5: Degree of reversibility

REVERSIBILITY OF IMPACT	CRITERIA
High	High potential for reversibility.
Medium	Medium potential for reversibility.
Low	Low potential for reversibility.
Zero	Zero potential for reversibility.

Table 6: Degree of irreplaceability

IRREPLACEABLE LOSS OF RESOURCES	CRITERIA
High	Definite loss of irreplaceable resources.

Medium	Medium potential for loss of irreplaceable resources.
Low	Low potential for loss of irreplaceable resources.
Zero	Zero potential for loss of irreplaceable resources.

Table 7: Cumulative Impact on the environment

CUMULATIVE IMPACTS	CRITERIA
High	The activity is one of *several* similar past, present or future activities in the same geographical area, and might contribute to a very significant combined impact on the geographical, physical, biological, social, economic and cultural aspects of the environment.
Medium	The activity is one of a *few* similar past, present or future activities in the same geographical area, and might contribute to a very significant combined impact on the geographical, physical, biological, social, economic and cultural aspects of the environment.
Low	The activity is localised and might have a negligible cumulative impact.
Zero	No cumulative impact on the environment.

APPENDIX 2: MINIMUM CONTENT REQUIREMENTS FOR TERRESTRIAL BIODIVERSITY SPECIALIST REPORTS AS PER PROTOCOL FOR THE SPECIALIST ASSESSMENT OF ENVIRONMENTAL IMPACTS ON TERRESTRIAL BIODIVERSITY (GN 320 OF 20 MARCH 2020)

Protocol ref	**Terrestrial Biodiversity Specialist Assessment Report Content**	**Section / Page**
3.1.1.	contact details of the specialist, their SACNASP registration number, their field of expertise and a curriculum vitae;	Page ii and Appendix 4
3.1.2.	a signed statement of independence by the specialist;	Page i
3.1.3.	a statement on the duration, date and season of the site inspection and the relevance of the season to the outcome of the assessment;	Section 5
3.1.4.	a description of the methodology used to undertake the site verification and impact assessment and site inspection, including equipment and modelling used, where relevant;	Appendix 3 and Section 5
3.1.5.	a description of the assumptions made and any uncertainties or gaps in knowledge or data as well as a statement of the timing and intensity of site inspection observations;	Section 5
3.1.6.	a location of the areas not suitable for development, which are to be avoided during construction and operation (where relevant);	Section 7
3.1.7.	additional environmental impacts expected from the proposed development;	Section 7
3.1.8.	any direct, indirect and cumulative impacts of the proposed development;	Section 7
3.1.9.	the degree to which impacts and risks can be mitigated;	Section 7
3.1.10.	the degree to which the impacts and risks can be reversed;	Section 7
3.1.11.	the degree to which the impacts and risks can cause loss of irreplaceable resources;	Section 7
3.1.12.	proposed impact management actions and impact management outcomes proposed by the specialist for inclusion in the Environmental Management Programme (EMPr);	Section 7
3.1.13.	a motivation must be provided if there were development footprints identified as per paragraph 2.3.6 above that were identified as having a "low" terrestrial biodiversity sensitivity and that were not considered appropriate;	N/A
3.1.14.	a substantiated statement, based on the findings of the specialist assessment, regarding the acceptability, or not, of the proposed development, if it should receive approval or not; and	Section 8
3.1.15.	any conditions to which this statement is subjected.	Section 8

APPENDIX 3: PLANT SPECIES ASSESSMENT AND SITE SENSITIVITY VERIFICATION

1. Introduction

The relative plant species theme sensitivity for the site generated by the web-based DFFE Screening Tool (https://screening.environment.gov.za) is rated as Very high, Medium and Low (Figures 1). An applicant intending to undertake an activity identified by the screening tool as being of Medium or High sensitivity for terrestrial plant species, must submit a Plant Species Specialist Assessment Report if verified (Government Gazette 2020b). In this instance, sensitive species were confirmed to be present within the study area, confirming the Very High sensitivity identified by the screening tool and therefore a plant species assessment is thus required and has been undertaken. The dates of the site visits are provide in the main body of this report. This report has been compiled following the guidelines set out for the **Terrestrial Fauna and Terrestrial Flora Species Protocols for Environmental Impact Assessments in South Africa** (SANBI 2022).

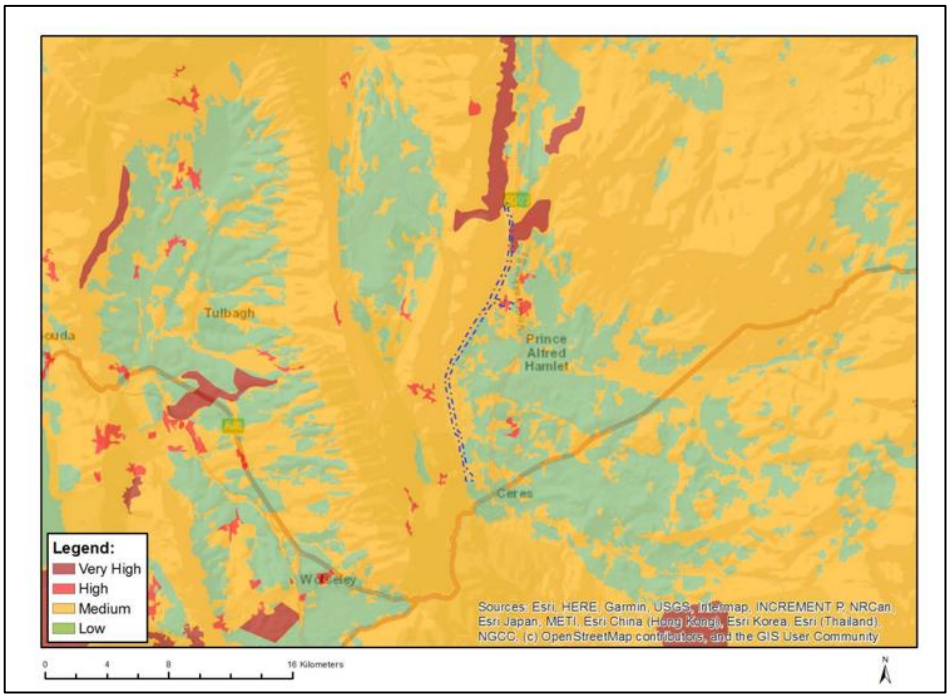


Figure 1. Map of relative plant species theme sensitivity generated from the DFFE Screening Tool (https://screening.environment.gov.za).

2. Project Area of Influence (PAOI)

In this case the PAOI is the areas surveyed during the two site visits (See main report). No impacts are expected to occur outside of this area if the mitigation is successfully applied.

3. Sensitive species within the study area

One sensitive species was recorded during the site visits (See Figure 2 and Figure 3 and Table 1 – Table 4 below). The list of sensitive species predicted to occur within the study area (based on the screening tool are listed in Table 1, and the sensitive species confirmed to be located within the study area are listed in Table 2. Table 3 provides additional information about the sensitive species that were confirmed or suspected (with high likelihood) to occur within the study area. Additional information on the sensitive species confirmed or suspected (with high likelihood) to be found on the site from The Red List of South African Plants website (www.redlist.sanbi.org) are listed in Table 4.

Figure 2. SENSITIVE SPECIES LOCALITIES: Google Earth™ aerial image showing the Prince Alfred Hamlet Tie-In with localities of the Critically Endangered *Leucadendron chamelaea* (bright red = very high sensitivity). Note the proposed positions of Tower 89 and 90.

Figure 3. Critically endangered *Leucadendron chamelaea* identified at waypoint 102 (33°16'31.77"S; 19°18'45.32"E). Note the proposed positions of Tower 89 and 90.

Table 1. Species predicted to be in the study area (by the screening tool) and found in the study area

Species	***IUCN Status***	***Observed/Likelihood of occurrence***	***Justification for likelihood of occurrence***
Anthochortus insignis	VU	*No/Low*	*This species was not found on the site and is unlikely to have been missed*
Aspalathus intricata subsp. intricata	Rare	*No/Low*	*This species was not found on the site and is unlikely to have been missed*
Aspalathus lanifera	VU	*No/Low*	*This species was not found on the site and is unlikely to have been missed*
Aspalathus ulicina subsp. ulicina	Rare	*No/Low*	*This species was not found on the site and is unlikely to have been missed*
Brunia myrtoides	VU	*No/Low*	*This species was not found on the site and is unlikely to have been missed*
Brunia powrieae	Rare	*No/Low*	*This species was not found on the site and is unlikely to have been missed*
Corymbium elsiae	Rare	*No/Low*	*This species was not found on the site and is unlikely to have been missed*
Erica caprina	VU	*No/Low*	*This species was not found on the site and is unlikely to have been missed*
Erica doliiformis	Rare	*No/Low*	*This species was not found on the site and is unlikely to have been missed*
Erica mitchellensis	Rare	*No/Low*	*This species was not found on the site and is unlikely to have been missed*
Euthystachys abbreviata	VU	*No/Low*	*This species was not found on the site and is unlikely to have been missed*
Evotella rubiginosa	Rare	*No/Low*	*This species was not found on the site and is unlikely to have been missed*
Geissorhiza geminata	EN	*No/Low*	*This species was not found on the site and is unlikely to have been missed*
Geissorhiza silenoides	VU	*No/Low*	*This species was not found on the site and is unlikely to have been missed*
Haplocarpha parvifolia	VU	*No/Low*	*This species was not found on the site and is unlikely to have been missed*
Heliophila cedarbergensis	Rare	*No/Low*	*This species was not found on the site and is unlikely to have been missed*
Heliophila elata	VU	*No/Low*	*This species was not found on the site and is unlikely to have been missed*
Heliophila polygaloides	Rare	*No/Low*	*This species was not found on the site and is unlikely to have been missed*
Lachnaea capitata	VU	*No/Low*	*This species was not found on the site and is unlikely to have been missed*
Lachnaea grandiflora	VU	*No/Low*	*This species was not found on the site and is unlikely to have been missed*
Lachnaea pedicellata	Rare	*No/Low*	*This species was not found on the site and is unlikely to have been missed*
Lachnaea uniflora	VU	*No/Low*	*This species was not found on the site and is unlikely to have been missed*
Lampranthus antonii	CR	*No/Low*	*This species was not found on the site and is unlikely to have been missed*
Lamprocephalus montanus	Rare	*No/Low*	*This species was not found on the site and is unlikely to have been missed*
Lebeckia grandiflora	Rare	*No/Low*	*This species was not found on the site and is unlikely to have been missed*

Leobordea globulosa	VU	*No/Low No/Low*	*This species was not found on the site and is unlikely to have been missed*
Leucadendron chamelaea	CR	*Confirmed*	*Confirmed subpopulation found.*
Leucadendron gydoense	EN	*No/Low*	*This species was not found on the site and is unlikely to have been missed*
Leucospermum catherinae	EN	*No/Low*	*This species was not found on the site and is unlikely to have been missed*
Low Sensitivity		*No/Low*	*This species was not found on the site and is unlikely to have been missed*
Osmitopsis nana	Rare	*No/Low*	*This species was not found on the site and is unlikely to have been missed*
Pachites bodkinii	Rare	*No/Low*	*This species was not found on the site and is unlikely to have been missed*
Pauridia alba	VU	*No/Low*	*This species was not found on the site and is unlikely to have been missed*
Pentameris caulescens	Rare	*No/Low*	*This species was not found on the site and is unlikely to have been missed*
Perdicium capense	VU	*No/Low*	*This species was not found on the site and is unlikely to have been missed*
Phaneroglossa bolusii	Rare	*No/Low*	*This species was not found on the site and is unlikely to have been missed*
Pharnaceum microphyllum var. albens	EN	*No/Low*	*This species was not found on the site and is unlikely to have been missed*
Phiambolia incumbens	Rare	*No/Low*	*This species was not found on the site and is unlikely to have been missed*
Phiambolia littlewoodii	VU	*No/Low*	*This species was not found on the site and is unlikely to have been missed*
Prismatocarpus implicatus	Rare	*No/Low*	*This species was not found on the site and is unlikely to have been missed*
Protea pityphylla	VU	*No/Low*	*This species was not found on the site and is unlikely to have been missed*
Protea rupicola	EN	*No/Low*	*This species was not found on the site and is unlikely to have been missed*
Pseudoselago quadrangularis	Rare	*No/Low*	*This species was not found on the site and is unlikely to have been missed*
Psoralea tenuissima	Rare	*No/Low*	*This species was not found on the site and is unlikely to have been missed*
Rafnia lancea	EN	*No/Low*	*This species was not found on the site and is unlikely to have been missed*
Restio durus	Rare	*No/Low*	*This species was not found on the site and is unlikely to have been missed*
Restio esterhuyseniae	Rare	*No/Low*	*This species was not found on the site and is unlikely to have been missed*
Restio parthenocarpos	EN	*No/Low*	*This species was not found on the site and is unlikely to have been missed*
Restio rigoratus	EN	*No/Low*	*This species was not found on the site and is unlikely to have been missed*
Romulea albomarginata	VU	*No/Low*	*This species was not found on the site and is unlikely to have been missed*
Senecio umbricola	Rare	*No/Low*	*This species was not found on the site and is unlikely to have been missed*
Sensitive species 1		*No/Low*	*This species was not found on the site and is unlikely to have been missed*
Sensitive species 1042		*No/Low*	*This species was not found on the site and is unlikely to have been missed*
Sensitive species 1198		*No/Low*	*This species was not found on the site and is unlikely to have been missed*

Sensitive species 1209		*No/Low*	*This species was not found on the site and is unlikely to have been missed*
Sensitive species 1230		*No/Low*	*This species was not found on the site and is unlikely to have been missed*
Sensitive species 1230		*No/Low*	*This species was not found on the site and is unlikely to have been missed*
Sensitive species 1257		*No/Low*	*This species was not found on the site and is unlikely to have been missed*
Sensitive species 22		*No/Low*	*This species was not found on the site and is unlikely to have been missed*
Sensitive species 259		*No/Low*	*This species was not found on the site and is unlikely to have been missed*
Sensitive species 263		*No/Low*	*This species was not found on the site and is unlikely to have been missed*
Sensitive species 266		*No/Low*	*This species was not found on the site and is unlikely to have been missed*
Sensitive species 373		*No/Low*	*This species was not found on the site and is unlikely to have been missed*
Sensitive species 444		*No/Low*	*This species was not found on the site and is unlikely to have been missed*
Sensitive species 459		*No/Low*	*This species was not found on the site and is unlikely to have been missed*
Sensitive species 468		*No/Low*	*This species was not found on the site and is unlikely to have been missed*
Sensitive species 501		*No/Low*	*This species was not found on the site and is unlikely to have been missed*
Sensitive species 560		*No/Low*	*This species was not found on the site and is unlikely to have been missed*
Sensitive species 593		*No/Low*	*This species was not found on the site and is unlikely to have been missed*
Sensitive species 61		*No/Low*	*This species was not found on the site and is unlikely to have been missed*
Sensitive species 705		*No/Low*	*This species was not found on the site and is unlikely to have been missed*
Sensitive species 794		*No/Low*	*This species was not found on the site and is unlikely to have been missed*
Sensitive species 848		*No/Low*	*This species was not found on the site and is unlikely to have been missed*
Sorocephalus scabridus	CR	*No/Low*	*This species was not found on the site and is unlikely to have been missed*
Spatalla caudata	EN	*No/Low*	*This species was not found on the site and is unlikely to have been missed*
Spatalla tulbaghensis	EN	*No/Low*	*This species was not found on the site and is unlikely to have been missed*
Syncarpha marlothii	Rare	*No/Low*	*This species was not found on the site and is unlikely to have been missed*
Thamnea hirtella	Rare	*No/Low*	*This species was not found on the site and is unlikely to have been missed*
Thesmophora scopulosa	VU	*No/Low*	*This species was not found on the site and is unlikely to have been missed*
Tritoniopsis lesliei	EN	*No/Low*	*This species was not found on the site and is unlikely to have been missed*
Wahlenbergia brachyphylla	Rare	*No/Low*	*This species was not found on the site and is unlikely to have been missed*
Wurmbea inusta	VU	*No/Low*	*This species was not found on the site and is unlikely to have been missed*
Zyrphelis levis	Rare	*No/Low*	*This species was not found on the site and is unlikely to have been missed*

Table 2. Sensitive species found within or in close proximity to the study area.

FAMILY	*Species*	*Status*	*Url link to observation(s)*
PROTEACEAE	*Leucadendron chamalaea*	**Critically Endangered A4c**	*https://www.inaturalist.org/observations/27222444*

Table 3. Sensitive species confirmed on the site or likely (high likelihood) to be found on the site

Species	**Distribution (Figure 3)**	**Viability**	**Population Size**	**Nature and extent of impact on Species**	**Known population size* and AOO (Appendix 8 of Guidelines)**	**Conservation importance**
Leucadendron chamalaea	Scattered individuals in groups (see Figure 3)	Viable	Estimated at 60+ plants seen. More individuals are likely to be present in the adjacent areas but the subpopulation is unlikely to be substantive since few plants were encountered.	The species can be avoided with mitigation.	17.28km^2	Very high

Table 4. Additional information on the SCC confirmed on the site or likely to be found on the site from The Red List of South African Plants website (www.redlist.sanbi.org)

Name	**Justification**	**Range**	**Habitat Description**	**Threats**	**Population**
Leucadendron chamalaea	A population reduction of 80% is projected to be met within the next 20 years based on observed population decline between 1995 and 2004. This species has a generation length of 20 years.	Koue Bokkeveld to Franschhoek Valley	Seasonally damp sandy flats, 150-1000 m.	This species' habitat has been severely reduced by cultivation of fruit vineyards, potatoes and other cash crops. It has lost at least 50% of its habitat, and 5% was lost between 1990 and 2014. Remaining subpopulations are now confined to road verges and small fragments where they are threatened by a lack of fire, alien invasive plants and road verge clearing. Agricultural pest control has also caused a decline in some subpopulations.	Formerly extensive subpopulations in the Breede River Valley, Witsenberg Vlakte and Koue Bokkeveld have been severely reduced and fragmented by agricultural expansion, with most plants now persisting in small remnants and road verges. A large proportion (30%) of the remaining subpopulation in the Breede River Valley was lost to road verge clearing in 2004. The majority of a large subpopulation of several thousand plants on the Witsenberg Vlakte recorded during Protea Atlas Monitoring between 1995 and 1997 has subsequently been lost to

					expanding orchards. At least 50% of subpopulations known through historical records are now locally extinct. The only large remaining subpopulation, consisting of >1000 mature individuals, is in the northern Koue Bokkeveld. Population reductions based on habitat loss underestimates the extent to which this species has declined over the past 40 years, as it has declined mainly due to road verge clearing and agricultural pest control - it is estimated to have declined by at least 60% within two generations. If loss continues, it is likely to exceed 80% within the next 20 years. This species is easily confused with L. corymbosum, and has led to contradictory reports on the status of this species in the past. Claims that this species is tolerant to grazing and ploughing are based on such misidentifications (Hall 1982, Hall 1984, Hall and Veldhuis 1985). The species was thought to be locally extinct in the Groot Drakenstein, Agter-Witsenberg and Koue Bokkeveld, but subpopulations have been rediscovered during Protea Atlas Project surveys (1991-2001).

4. Site Ecological Importance (SEI)(derived from SANBI 2022 guidelines)

SEI is considered to be a function of the biodiversity importance (BI) of the receptor (e.g. species of conservation concern, the vegetation/fauna community or habitat type present on the site) and its resilience to impacts (receptor resilience [RR]) as follows:

EI = BI + RR

BI is a function of conservation importance (CI) and the functional integrity (FI) of the receptor as follows:

BI = CI + FI

Definitions of the functions used to calculate EI appear below along with the tables of criteria:

Conservation importance (CI) is defined as:

> *'The importance of a site for supporting biodiversity features of conservation concern present, e.g. populations of IUCN threatened and Near Threatened species (CR, EN, VU and NT), Rare species, range-restricted species, globally significant populations of congregatory species, and areas of threatened ecosystem types, through predominantly natural processes.'*

Table 5. Fulfilling criteria and categories for Conservation Importance.

Conservation importance	Fulfilling criteria
Very high	Confirmed or highly likely occurrence of CR, EN, VU or Extremely Rare or Critically Rare species that have a global EOO of < 10 km^2.
	Any area of natural habitat of a CR ecosystem type or large area (> 0.1% of the total ecosystem type extent) of natural habitat of EN ecosystem type.
	Globally significant populations of congregatory species (> 10% of global population).

High	Confirmed or highly likely occurrence of CR, EN, VU species that have a global EOO of > 10 km^2. IUCN threatened species (CR, EN, VU) must be listed under any criterion other than A. If listed as threatened only under Criterion A, include if there are less than 10 locations or < 10 000 mature individuals remaining.
	Small area (> 0.01% but < 0.1% of the total ecosystem type extent) of natural habitat of EN ecosystem type or large area (> 0.1%) of natural habitat of VU ecosystem type.
	Presence of Rare species.
	Globally significant populations of congregatory species (> 1% but < 10% of global population).
Medium	Confirmed or highly likely occurrence of populations of NT species, threatened species (CR, EN, VU) listed under Criterion A only and which have more than 10 locations or more than 10 000 mature individuals.
	Any area of natural habitat of threatened ecosystem type with status of VU.
	Presence of range-restricted species.
	> 50% of receptor contains natural habitat with potential to support SCC.
Low	No confirmed or highly likely populations of SCC.
	No confirmed or highly likely populations of range-restricted species.
	< 50% of receptor contains natural habitat with limited potential to support SCC.
Very low	No confirmed and highly unlikely populations of SCC.
	No confirmed and highly unlikely populations of range-restricted species.
	No natural habitat remaining.

Functional integrity (FI) of the receptor (e.g. the vegetation/fauna community or habitat type) is defined here as the receptors' current ability to maintain the structure and functions that define it, compared to its known or predicted state under ideal conditions. Simply stated, FI is:

'A measure of the ecological condition of the impact receptor as determined by its remaining intact and functional area, its connectivity to other natural areas and the degree of current persistent ecological impacts.'

Table 6. Fulfilling criteria and categories for Functional Integrity.

Functional integrity	Fulfilling criteria
Very high	Very large (> 100 ha) intact area for any conservation status of ecosystem type or > 5 ha for CR ecosystem types.
	High habitat connectivity serving as functional ecological corridors, limited road network between intact habitat patches.
	No or minimal current negative ecological impacts with no signs of major past disturbance (e.g. ploughing).
High	Large (> 20 ha but < 100 ha) intact area for any conservation status of ecosystem type or > 10 ha for EN ecosystem types.
	Good habitat connectivity with potentially functional ecological corridors and a regularly used road network between intact habitat patches.
	Only minor current negative ecological impacts (e.g., few livestock utilizing area) with no signs of major past disturbance (e.g., ploughing) and good rehabilitation potential.
Medium	Medium (> 5 ha but < 20 ha) semi-intact area for any conservation status of ecosystem type or > 20 ha for VU ecosystem types.
	Only narrow corridors of good habitat connectivity or larger areas of poor habitat connectivity and a busy used road network between intact habitat patches.
	Mostly minor current negative ecological impacts with some major impacts (e.g. established population of alien and invasive flora) and a few signs of minor past disturbance. Moderate rehabilitation potential.
Low	Small (> 1 ha but < 5 ha) area.
	Almost no habitat connectivity but migrations still possible across some modified or degraded natural habitat and a very busy used road network surrounds the area. Low rehabilitation potential.
	Several minor and major current negative ecological impacts.
Very low	Very small (< 1 ha) area.
	No habitat connectivity except for flying species or flora with wind-dispersed seeds.
	Several major current negative ecological impacts.

Receptor resilience (RR) is defined here as:

'The intrinsic capacity of the receptor to resist major damage from disturbance and/or to recover to its original state with limited or no human intervention.'

Table 7. Fulfilling criteria and categories for Receptor Resilience.

Resilience	Fulfilling criteria
Very high	Habitat that can recover rapidly (~ less than 5 years) to restore > 75%[28] of the original species composition and functionality of the receptor functionality, or species that have a very high likelihood of remaining at a site even when a disturbance or impact is occurring, or species that have a very high likelihood of returning to a site once the disturbance or impact has been removed.
High	Habitat that can recover relatively quickly (~ 5–10 years) to restore > 75% of the original species composition and functionality of the receptor functionality, or species that have a high likelihood of remaining at a site even when a disturbance or impact is occurring, or species that have a high likelihood of returning to a site once the disturbance or impact has been removed.
Medium	Will recover slowly (~ more than 10 years) to restore > 75% of the original species composition and functionality of the receptor functionality, or species that have a moderate likelihood of remaining at a site even when a disturbance or impact is occurring, or species that have a moderate likelihood of returning to a site once the disturbance or impact has been removed.
Low	Habitat that is unlikely to be able to recover fully after a relatively long period: > 15 years required to restore ~ less than 50% of the original species composition and functionality of the receptor functionality, or species that have a low likelihood of remaining at a site even when a disturbance or impact is occurring, or species that have a low likelihood of returning to a site once the disturbance or impact has been removed.
Very low	Habitat that is unable to recover from major impacts, or species that are unlikely to remain at a site even when a disturbance or impact is occurring, or species that are unlikely to return to a site once the disturbance or impact has been removed.

SEI Calculation for Development Footprint

Table 8. Calculation of SEI ratings of each function and the relevant fulfilling criteria for the proposed development.

Function	Rating
CI	High
FI	High
RR	High

Biodiversity Importance is calculated using the matrix in Table 9 and for this site is **High.**

Table 9. Calculation matrix for deriving Biodiversity Importance (BI)

Biodiversity importance		Conservation importance				
		Very high	High	Medium	Low	Very low
Functional integrity	Very high	Very high	Very high	High	Medium	Low
	High	Very high	High	Medium	Medium	Low
	Medium	High	Medium	Medium	Low	Very low
	Low	Medium	Medium	Low	Low	Very low
	Very low	Medium	Low	Very low	Very low	Very low

SEI is calculated using the matrix in Table 10 and for this site is **Medium**

Table 10. Calculation matrix for deriving Site Ecological Importance (SEI)

Site ecological importance		Biodiversity importance				
		Very high	High	Medium	Low	Very low
Receptor resilience	Very low	Very high	Very high	High	Medium	Low
	Low	Very high	Very high	High	Medium	Very low
	Medium	Very high	High	Medium	Low	Very low
	High	High	Medium	Low	Very low	Very low
	Very high	Medium	Low	Very low	Very low	Very low

Table 11. Guidelines for interpreting SEI in the context of the proposed development activities.

Site ecological importance	Interpretation in relation to proposed development activities
Very high	Avoidance mitigation – no destructive development activities should be considered. Offset mitigation not acceptable/not possible (i.e. last remaining populations of species, last remaining good condition patches of ecosystems/ unique species assemblages). Destructive impacts for species/ecosystems where persistence target remains.
High	Avoidance mitigation wherever possible. Minimisation mitigation – changes to project infrastructure design to limit the amount of habitat impacted; limited development activities of low impact acceptable. Offset mitigation may be required for high impact activities.
Medium	Minimisation and restoration mitigation – development activities of medium impact acceptable followed by appropriate restoration activities.
Low	Minimisation and restoration mitigation – development activities of medium to high impact acceptable followed by appropriate restoration activities.
Very low	Minimisation mitigation – development activities of medium to high impact acceptable and restoration activities may not be required.

The proposed development area has a **Medium SEI** and the suggested mitigation is **minimisation and restoration**.

5. Impacts and Mitigation

The following impacts were identified:

1. Loss of individuals - affecting the overall viability of the subpopulation. Removal by clearing vegetation during (a) all activities of the project (construction, operation and decommissioning), and (b) construction or clearing for access roads.
2. Damage to the species by:
    a. Eskom's vegetation management strategy (in this instance brush cutting).
    b. Construction vehicles and personal (construction, operational phases and decommissioning phases).

The impacts without mitigation are difficult to quantify but as a rule impacts would be more severe with increased loss in numbers of individuals. This could range from Low to Very High since the subpopulation is rated as having Very High sensitivity. Impacts could be largely avoided and it is anticipated that no more than three individuals would be lost Low (negative impact). If all the individuals are destroyed this is likely to compromise the subpopulations viability and could lead to subpopulation collapse (Very High impact). The key mitigation recommendation are (1)

avoidance, and (2) adapted vegetation clearing policy whereby the species is not ever cut, and (3) maintaining fire – a key ecological driver.

Mitigation should thus include the following:

1. A survey should be undertaken by a botanical specialist no longer than 6 months prior to construction. The subpopulation and outlying individuals must be mapped with the ECO and Eskom. This should include checking the status quo of the known localities at waypoint 096: 33°16'30.25"S; 19°18'39.96"E, waypoint 133:33°16'32.28"S; 19°18'50.99"E and high numbers in the vicinity of 102 :33°16'31.77"S; 19°18'45.32"E). These points were previously flagged during a micro-siting exercise with Eskom. Tower 89 and Tower 90 are located within 10 m of several individuals.
2. An ECO must be present just prior to construction, before any contractors arrive to ensure that the mapped localities are marked and/or fenced off.
3. With respect to Eskom's Vegetation Management Plan, it will not be necessary to brush cut any *Leucadendron chamalaea* plants since they obtain a maximum height of 2m. Cutting would lead to loss of seed producing cones and would lead to decrease in subpopulation numbers if this practice is carried out. Ecological burns should be sustained for the subpopulations since fire is required to stimulate seed gemination. In the absence of fire, the existing generation will deteriorate with time. Fire frequency is however, probably higher than normal due to the high amount of human activity and incidence of accidental fires. Fire frequency should thus be monitored.
4. No additional access road must be constructed. An access road already exists.

6. Conclusions

The main body of this report addresses the key mitigation measures required to minimize overall botanically related impacts. Similarly, the recommended mitigation to prevent loss of sensitive species, in this instance the Critically Endangered Witsenberg conebush *Leucandendron chamalaea*, should be adhered to. These measures should be a condition of approval since the receiving environment and species require careful consideration during all phases of the project's lifespan. The recommendation should be included in Eskom's Environmental Management Program (EMPr) for the project.

7. Content of report requirement and relevant sections

		Section or page of report
2.1	The assessment must be undertaken by a specialist registered with the South African Council for Natural Scientific Professions (SACNASP), within a field of practice relevant to the taxonomic groups ("taxa") for which the assessment is being undertaken.	Page ii and Appendix 4
2.2	The assessment must be undertaken within the study area.	It was
2.3	The assessment must be undertaken in accordance with the *Species Environmental Assessment Guideline* and must:	It was
2.3.1	Identify the SCC which were found, observed or are likely to occur within the study area;	Tables 1
2.3.2	provide evidence (photographs) of each SCC found or observed within the study area, which must be disseminated by the specialist to a recognized online database facility immediately after the site inspection has been performed (prior to preparing the report contemplated in paragraph 3).	Table 2
2.3.3	identify the distribution, location, viability and detailed description of population size of the SCC identified within the study area.	Table 2
2.3.4	identify the nature and the extent of the potential impact of the proposed development to the population of the SCC located within the study area.	Section 4
2.3.5	determine the importance of the conservation of the population of the SCC identified within the study area, based on information available in national and international databases including the IUCN Red List of Threatened Species, South African Red List of Species, and/or other relevant databases.	Section 3
2.3.6	determine the potential impact of the proposed development on the habitat of the SCC located within the study area.	Section 3
2.3.7	include a review of relevant literature on the population size of the SCC, the conservation interventions as well as any national or provincial species management plans for the SCC. This review must provide information on the need to conserve the SCC and indicate whether the development is compliant with the applicable species management plans and if not, a motivation for the deviation;	Tables 2 to 4
2.3.8	identify any dynamic ecological processes occurring within the broader landscape, that might be disrupted by the development and result in negative impact on the identified SCC, for example, fires in fire-prone systems.	N/A
2.3.9	identify any potential impact on ecological connectivity within the broader landscape and resulting impacts on the identified SCC and its long term viability.	N/A
2.3.10	determine buffer distances as per the *Species Environmental Assessment Guidelines* used for the population of each SCC; and	N/A
2.3.11	discuss the presence or likelihood of additional SCC including threatened species not identified by the screening tool, *Data Deficient or Near Threatened Species, as well as any undescribed species26; and*	Section 3
2.3.12	identify any alternative development footprints within the preferred	N/A

	development site which would be of "low" sensitivity" or "medium" sensitivity as identified by the screening tool and verified through the site sensitivity verification.	

APPENDIX 4: CURRICULUM VITAE: PAUL EMMS

EDUCATION

MSc (Botany) - University of the Western Cape (2014).

BSc: Hons (Botany) – University of the Western Cape (2005).

BSc: Biodiversity and Conservation Biology - University of the Western Cape (2002 – 2004).

National Diploma in Horticulture - Cape Peninsula University of Technology (1998 – 2000).

CAREER HISTORY

April 2019 – present – Director at Capensis

March 2011 – April 2019 – independent botanical specialist and associate at Bergwind Botanical Surveys & Tours CC.

March 2008 - March 2010 - field botanist and botanical specialist - Coastec (Coastal & Environmental Consultants).

January 2006 – December 2007 - Kirstenbosch Scholarship: horticultural research - South African National Biodiversity Institute.

ACCREDITATION

Registered Professional Natural Scientist with the South African Council for Natural Scientific Practitioners (SACNASP).

Registration number 400352/14.

South African Association of Botanists (SAAB)

International Association for Impact Assessment South Africa (IAIAsa)

EXPERIENCE and SKILLS

Botanical specialist consultant

- Ecological Constraints Analysis
- Invasive Alien Plant Management Plans
- Vegetation Rehabilitation Plans
- Plant Search and Rescue Plans
- Conservation Management Plans
- Over 300 botanical assessments

PERSONAL DETAILS

- Paul Emms
- Fish Hoek, Cape Town
- Cell: 076 7377 468.
- emmspaul@gmail.com
- Date of birth – 31/08/1979
- Marital status - Married
- Dependents - 3

forestry, fisheries
& the environment
Department:
Forestry, Fisheries and the Environment
REPUBLIC OF SOUTH AFRICA

Private Bag X447, Pretoria, 0001, Environment House, 473 Steve Biko Road, Pretoria, 0002 Tel: +27 12 399 9000, Fax: +27 86 625 1042

SPECIALIST DECLARATION FORM – AUGUST 2023

Specialist Declaration form for assessments undertaken for application for authorisation in terms of the National Environmental Management Act, Act No. 107 of 1998, as amended and the Environmental Impact Assessment (EIA) Regulations, 2014, as amended (the Regulations)

REPORT TITLE
Ceres - Witzenberg 132kV Powerline and Prince Alfred Hamlet Substation.

Kindly note the following:

1. This form must always be used for assessment that are in support of applications that must be subjected to Basic Assessment or Scoping & Environmental Impact Reporting, where this Department is the Competent Authority.
2. This form is current as of August 2023. It is the responsibility of the Applicant / Environmental Assessment Practitioner (EAP) to ascertain whether subsequent versions of the form have been published or produced by the Competent Authority. The latest available Departmental templates are available at https://www.dffe.gov.za/documents/forms.
3. An electronic copy of the signed declaration form must be appended to all Draft and Final Reports submitted to the department for consideration.
4. The specialist must be aware of and comply with '*the Procedures for the assessment and minimum criteria for reporting on identified environmental themes in terms of sections 24(5)(a) and (h) and 44 of the act, when applying for environmental authorisation - GN 320/2020)*', where applicable.

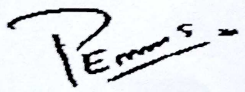
1. SPECIALIST INFORMATION

Title of Specialist Assessment	Ceres - Witzenberg 132kV Powerline and Prince Alfred Hamlet Substation
Specialist Company Name	Capensis Ecological Consulting (Pty) Ltd
Specialist Name	Paul Ivor Emms
Specialist Identity Number	7908315242088
Specialist Qualifications:	ND Horticulture, BSc. (Biodiversity & Conservation Biology), Hons. (Botany), MSc (Botany).
Professional affiliation/registration:	SACNASP, SAAB, IAIAsa
Physical address:	165 Main Rd, Muizenberg, Cape Town, 7950
Postal address:	As above.
Postal address	As above
Telephone	0767377468
Cell phone	As above
E-mail	paul@capensis.co.za

2. DECLARATION BY THE SPECIALIST

I, Paul Ivor Emms declare that –

- I act as the independent specialist in this application;
- I am aware of the procedures and requirements for the assessment and minimum criteria for reporting on identified environmental themes in terms of sections 24(5)(a) and (h) and 44 of the National Environmental Management Act (NEMA), 1998, as amended, when applying for environmental authorisation which were promulgated in Government Notice No. 320 of 20 March 2020 (i.e. "the Protocols") and in Government Notice No. 1150 of 30 October 2020.
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;
- I declare that there are no circumstances that may compromise my objectivity in performing such work;
- I have expertise in conducting the specialist report relevant to this application, including knowledge of the Act, Regulations and any guidelines that have relevance to the proposed activity;
- I will comply with the Act, Regulations and all other applicable legislation;
- I have no, and will not engage in, conflicting interests in the undertaking of the activity;
- I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing –
  - any decision to be taken with respect to the application by the competent authority; and;
  - the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
- All the particulars furnished by me in this form are true and correct; and
- I realise that a false declaration is an offence in terms of Regulation 48 and is punishable in terms of section 24F of the NEMA Act.



Signature of the Specialist

Capensis Ecological Consulting (Pty) Ltd

Name of Company:

5 March 2024

Date

3. UNDERTAKING UNDER OATH/ AFFIRMATION

I, _Paul Ivor Emms, swear under oath / affirm that all the information submitted or to be submitted for the purposes of this application is true and correct.

Signature of the Specialist

Capensis Ecological Consulting (Pty) Ltd

Name of Company

5 March 2024

Date

SUID-AFRIKAANSE POLISIEDIENS
COMMUNITY SERVICE CENTRE
MUIZENBERG
08 MAR 2024
COMMUNITY SERVICE CENTRE
MUIZENBERG
SOUTH AFRICAN POLICE SERVICE

Signature of the Commissioner of Oaths

2024-03-08

Date