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# Terrestrial Biodiversity (Vegetation) Assessment and Plant Species Site Verification & Compliance Statement

# Proposed Nietgedacht Ext 4 Township on Portion 39 of the farm Nietgedacht 535JQ

April 2025

*Report drafted for Galago Environmental by:*

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**Indemnity**

This report is based on survey and assessment techniques which are limited by time and budgetary constraints relevant to the type and level of investigation undertaken. The findings, results, observations, conclusions, and recommendations given in this report are based on the author's best scientific and professional knowledge as well as available information at the time of study. Therefore, the author reserves the right to modify aspects of the report including the recommendations if and when new information may become available from ongoing research or further work in this field, or pertaining to this investigation.

Although the author exercises due care and diligence in rendering services and preparing documents, she accepts no liability, and the client, by receiving this document, indemnifies the author against all actions, claims, demands, losses, liabilities, costs, damages and expenses arising from or in connection with services rendered, directly or indirectly by the author and by the use of this document.

**Expertise of author:**

- Working in the field of ecology, and in specific vegetation related assessments, since 2007;
- Is registered as a Professional Natural Scientist with the South African Council for Natural Scientific Professions in the field of ecology (Reg. No. 400019/11); and
- Has been working with plants indigenous to South Africa since 1997.

**Declaration of independence:**

Dimela Eco Consulting in an independent consultant and hereby declare that it does not have any financial or other vested interest in the undertaking of the proposed activity, other than remuneration for the work performed in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998). In addition, remuneration for services provided by Dimela Eco Consulting is not subjected to or based on approval of the proposed project by the relevant authorities responsible for authorising this proposed project.

**Disclosure:**

Dimela Eco Consulting undertake to disclose, to the competent authority, any material information that has or may have the potential to influence the decision of the competent authority or the objectivity of any report, plan or document required in terms of the National Environmental Management Act, 1998 (Act 107 of 1998) and will provide the competent authority with access to all information at its disposal regarding the application, whether such information is favourable to the applicant or not.

Based on information provided to Dimela Eco Consulting by the client, and in addition to information obtained during the course of this study, Dimela Eco Consulting present the results and conclusion within the associated document to the best of the authors professional judgement and in accordance with best practise.

_____ _____

Antoinette Eyssell Date

SACNASP Reg. No. 400019/11



## Copyright:

## COMPLIANCE WITH THE PROTOCOL FOR THE SPECIALIST ASSESSMENT AND MINIMUM REPORT CONTENT REQUIREMENT FOR ENVIRONMENTAL IMPACTS ON TERRESTRIAL BIODIVERSITY (VEGETATION)

| No | Minimum report content: Vegetation assessment | Section in this report |
|---|---|---|
| 2.1 | The assessment must be prepared by a specialist registered with the South African Council for Natural Scientific Professionals (SACNASP) with expertise in the field of terrestrial biodiversity. | Appendix D: CV |
| 2.2 | The assessment must be undertaken on the preferred site and within the proposed development footprint | Appendix A: Sample areas map |
| 2.3 | **The assessment must provide a baseline description of the site which includes, as a minimum, the following aspects:** | |
| 2.3.1 | A description of the ecological drivers or processes of the system and how the proposed development will impact these; | Section 3<br>Section 4 |
| 2.3.2 | Ecological functioning and ecological processes (e.g., fire, migration, pollination, etc) that operate within the preferred site | Section 3<br>Section 4 |
| 2.3.3 | The ecological corridors that the proposed development would impede including migration and movement of flora | Section 4<br>Section 7 |
| 2.3.4 | The description of any significant terrestrial landscape features (including rare or important flora associations presence of Strategic Water Source Areas (SWSAs) or Freshwater Ecosystem Priority Area sub catchments; | Section 3<br>Section 4 |
| 2.3.5 | A description of terrestrial biodiversity and ecosystems on the site, including:<br>a) main vegetation types;<br>b) threatened ecosystems, including listed ecosystems as well as locally important habitat types identified;<br>c) ecological connectivity, habitat fragmentation, ecological processes and fine scale habitats; and<br>d) species, distribution, important habitats | Section 4: Results |
| 2.3.6 | The assessment must identify any alternative development footprints within the preferred site which would be of low sensitivity identified by the screening tool and verified | NA |
| 2.3.7 | The assessment must be based on the results of a site inspection undertaken on the preferred site and must identify:<br>2.3.7.1 Terrestrial Critical Biodiversity Areas (CBAs), including:<br>a) the reasons why an area has been identified as a CBA;<br>b) an indication of whether or not the proposed development is consistent with maintaining the CBA in a natural or near natural state or in achieving the goal of rehabilitation;<br>c) the impact on species composition and structure of vegetation with an indication of the extent of clearing activities in proportion to the remaining extent of the ecosystem type(s);<br>d) the impact on ecosystem threat status;<br>e) the impact on explicit subtypes in the vegetation;<br>f) the impact on overall species and ecosystem diversity of the site; and<br>g) the impact on any changes to threat status of populations of species of conservation concern in the CBA; | Section 3: Baseline description<br>Section 4: Results<br>Section 7.1.1 |
| | 2.3.7.2 Terrestrial Ecological Support Areas (ESAs), including:<br>a) the impact on the ecological processes that operate within or across the site; | Section 3: Baseline description |

| No | Minimum report content: Vegetation assessment | Section in this report |
|---|---|---|
| | b) the extent the proposed development will impact on the functionality of the ESA; and<br>c) loss of ecological connectivity (on site, and in relation to the broader landscape) due to the degradation and severing of ecological corridors or introducing barriers that impede migration and movement of flora and fauna; | Section 4: Results<br>Section 7.1.1 |
| | 2.3.7.3 Protected areas as defined by the National Environmental protected Area Act, 2004, including-An opinion on whether the<br>a) Proposed development aligns with the objectives of the protected area and the zoning as per the protected areas management plan. | N.A. |
| | 2.3.7.4 Priority areas for protected area expansion, including-<br>a) the way in which in which the proposed development will compromise or contribute to the expansion of the protected area network; | N.A. |
| | 2.3.7.5 SWSAs including:<br>a) the impact(s) on the terrestrial habitat of a SWSA; and<br>b) the impacts of the proposed development on the SWSA water quality and quantity (e.g., describing potential increased runoff leading to increased sediment load in water courses); | Section 3.4 |
| | 2.3.7.6 FEPA sub catchments, including-<br>a) the impacts of the proposed development on habitat species in the FEPA sub catchment; | See Aquatic /wetland report |
| | 2.3.7.7 Indigenous forests, including:<br>a) impact on the ecological integrity of the forest; and<br>b) percentage of natural or near natural indigenous forest area lost and a statement on the implications in relation to the remaining areas. | NA |
| 3 | **The Terrestrial Biodiversity Specialist Assessment Report must contain, as a minimum the following information:** | |
| 3.1.1 | Contact details of the specialist, their SACNASP registration number, their field of expertise and a curriculum vitae; | Appendix D |
| 3.1.2 | A signed statement of independence by the specialist; | See preceding page |
| 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 2: Methodology |
| 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 | Section 2: Methodology |
| 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 1.3 |
| 3.1.6 | A location of the areas not suitable for development, which are to be avoided during construction and operation | Section 5 |
| 3.1.7 | Additional environmental impacts expected from the proposed development | Section 7 Impact assessment |
| 3.1.8 | Any direct, indirect, and cumulative impacts of the proposed development | |
| 3.1.9 | The degree to which impacts and risks can be mitigated | |
| 3.1.10 | The degree to which the impacts and risks can be reversed | |
| 3.1.11 | The degree to which the impacts and risks can cause loss of irreplaceable resources; | |

| No | Minimum report content: Vegetation assessment | Section in this report |
|---|---|---|
| 3.1.12 | Proposed impact management actions and impact management outcomes proposed by the specialist for inclusion in the Environmental Management Programme (EMPr); | |
| 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; | NA |
| 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<br>Section9 |
| 3.1.15 | Any conditions to which this statement is subjected | |

## COMPLIANCE WITH THE PROTOCOL FOR THE SPECIALIST ASSESSMENT AND MINIMUM REPORT CONTENT REQUIREMENTS FOR ENVIRONMENTAL IMPACTS ON TERRESTRIAL PLANT SPECIES

As per Table 1:

1.2 An applicant intending to undertake an activity identified in the scope of this protocol, on a site identified by the screening tool as being of **"medium sensitivity"** for terrestrial plant species, must submit either a Terrestrial Plant Species Specialist Assessment Report or a Terrestrial Plant Species Compliance Statement, depending on the outcome of a site inspection.

| No | Minimum report content: Medium Sensitivity Species of Conservation Concern Confirmation | Section in this report |
|---|---|---|
| 4.1 | Medium sensitivity data represents suspected habitat for species of conservation concern ("SCC") based on occurrence records for these species collected prior to 2002 and/or is based on habitat suitability modelling. | Appendix C |
| 4.2 | The presence or likely presence of the SCC identified by the screening tool, must be confirmed through a site inspection by a specialist registered with the SACNASP in a field of practice relevant to the taxonomic group ("taxa") for which the assessment is being undertaken. | Appendix C<br>Appendix D |
| 4.3 | The assessment must be undertaken within the study area. | Appendix A |
| 4.4 | The site inspection to determine the presence or likely presence of SCC must be undertaken in accordance with the Species Environmental Assessment Guideline. | Appendix C<br>Section 4.4.2 |
| 4.5 | The site inspection is to confirm the presence, likely presence or confirmed absence of a SCC within the site identified as "medium" sensitivity by the screening tool. | Appendix C, including additional species sources from iNaturalist, historic data from South African National Biodiversity Institute ("SANBI") on the new Plants of Southern Africa website, and other data |
| 4.6 | Where SCC are found on site or have been confirmed to be likely present, a Terrestrial Plant Species Specialist Assessment must be submitted in accordance with the requirements specified for "very high" and "high" sensitivity in this protocol. | See recommendation in: Section 4.4.2.: Sensitive plant species site inspection result.<br>Section 7.2<br>Appendix C |
| 4.7 | Similarly, where no SCC are found on site during the investigation or if the presence is confirmed to be unlikely, a Terrestrial Plant Species Compliance Statement must be submitted. | NA |

# EXECUTIVE SUMMARY

The Nietgedacht Ext 4 Township is located on Portion 39 of the farm Nietgedacht 535JQ in Gauteng Province. The landowners propose the construction of a church to accommodate 3000 people, an onsite wastewater treatment works for toilets and parking. The study site is about 14.5ha in extent and is situated about 3.5km southwest of Diepsloot West. The site is located between the N14 highway between Krugersdorp and Pretoria in the north and the R114 road in the south. A dirt road forms the north-eastern boundary and the Jukskei River forms the most western boundary. The site is within the quarter degree square 2527DD.

The following information pertaining to the site is relevant as detailed by the National Web based Environmental Screening Tool downloaded on 28/03/2025 at 15:04:45.

- The site is classified as '**high terrestrial biodiversity sensitivity'**. The site intersects Ecological Support Areas 1 and 2 (ESAs) and the Jukskei River on the western extent of the site falls within a CBA 1.

- The site is classified as "**medium sensitivity"** for plant species and indicates that suitable habitat for at least two (2) such species may be present, but there are no confirmed records for the site yet. Therefore, a plant species site verification must be undertaken to confirm the absence or likely occurrence of such species.

As per the Protocol for the Specialist Assessment and Minimum Report Content Requirement for Environmental Impacts on Terrestrial Biodiversity, a terrestrial vegetation assessment, as well as a terrestrial plant species habitat assessment and resulting -compliance statement, as published in the Government Gazette No 43855 on 30 October 2020 in terms of sections24(5)(a) and 25 (5)(h) of NEMA, was undertaken.

This report relied on a single site visit undertaken on **22 April 2025**. The site visit was undertaken towards the end of the growing and flowering period. Some species could have been overlooked, not identifiable to species level (e.g., absence of flowers), or already dormant. Due to a good rainfall season, the grass layer was dense, and smaller species may have been overlooked.

**Baseline information**

The site falls within the summer rainfall region of South Africa, with most rain falling between November and March. Halfway House Granite underlies the area, leading to soils derived from these sources that are light brown, shallow and freely drained on the upland areas, with somewhat darker clayey soils in the bottomlands along the watercourses. The site slopes south-westward towards the Jukskei River. The highest point is on the north-eastern boundary along the dirt road at an elevation of 1354m dropping to 1310 along the Jukskei River. The site is not located within a Strategic Water Source Area.

The study site is situated within the Grassland Biome of South Africa and in specific the Egoli Granite Grassland. According to the 2022 Revised National List of Threatened Ecosystems,

the remaining extent of Egoli Granite Grassland is classified as Critically Endangered. Although the site falls within the historic extent of Egoli Granite Grassland, the site and surrounds have historically been ploughed and according to the National Biodiversity Assessment (NBA) 2018, the site **does not** fall within remnants of the Egoli Granite Grassland.

As per the Gauteng Conservation Plan (v4), the project area in the west (along the Jukskei River) falls within a Critical Biodiversity Area (CBA 1). An Ecological Support Area (ESA) 2 extents through the site to an ESA 1 in the north-eastern corner of the site.

**Historic and current land use and land cover**

Historic aerial imagery as well as satellite imagery show that much of the site was historically cultivated. Also, land to the north, east and south were extensively cultivated. The imagery show infrastructure present on the site, as well as the historically ploughed grassland. By the year 2015, a dam was constructed on the western extent of the site, along the Jukskei River. Several cutoff drains can be seen and was verified during the site verification. By the year 2019, the dam was filled in and rows of planted trees are visible on the southern boundary. A waterfilled pit or disused query is also present. No further cultivation took place on the site.

**Vegetation groups and Site Ecological Importance**

The vegetation on the site comprised secondary grassland with numerous localised disturbances. No natural or good condition grassland was recorded on or adjacent to the site. The vegetation groups, as well as the Site Ecological Importance ("SEI") of the vegetation groups were grouped as per the table below.

| Broad vegetation group | Site Ecological Importance (SEI) – mitigation |
|---|---|
| **Transformed** | **Very Low (Minimise)** |
| **Secondary grassland** | **Low (Minimise & Restore)** |
| ***Eucalytpus* dominated secondary grassland** | **Low (Minimise & Restore)** |
| **Moist grassland** | **Medium (Minimise & restore)** |
| **Riparian vegetation** | **High (Avoid & Minimise)**) |

The screening tool rates most of the site as being of high terrestrial biodiversity sensitivity, triggered by the Ecological Support Areas (ESAs), Critical Biodiversity Areas as well as the Critically Endangered Egoli Granite grassland that occurs in the area that the site is situated in. However, this assessment found that the vegetation on the site comprises mainly secondary grassland that is not representative of Egoli Granite Grassland and does not contribute to the conservation of this Critically Endangered ecosystem.

This finding of this assessment refutes the high sensitivity rating based on Egoli Granite Grassland that corresponds to the findings of the National Biodiversity Assessment wherein the site is not located in remnant patches of Egoli Granite Grassland (SANBI, 2019). The secondary grassland (as the vegetation is severely modified), is classified by this report as low sensitivity and no plant species of conservation concern were recorded or are expected to persist. Most types of development can proceed within these areas with little to no impact on conservation worthy vegetation, if edge effects to other proximate sensitivity classes are mitigated / prevented.

The site includes moist grassland. Note that the moist grasslands are an indication of where wetlands could occur. The moist grasslands, due to historic disturbances and the secondary nature of the vegetation, was classified as medium sensitivity by this report. However, the wetland assessment for the project must be consulted for the delineated boundaries, buffers and sensitivity of the wetlands on the site.

The riparian vegetation along the Jukskei River plays an important role in soil stabilisation, water purification and flood attenuation. Furthermore, it forms part of the watercourse which is protected by the National Water Act (1998) and classified as high sensitivity in this report.

The CBA along the Jukskei River must be avoided. For the continuation of ecosystem services, the secondary grasslands within the ESA1 and ESA 2 should remain connected where possible and maintained as a corridor to the Jukskei River.

From a vegetation perspective there is no objection to the proposed development provided that mitigation measures as set out in this report is adhered to as a minimum.

**Plant species of conservation concern (SCC) site inspection**

No plant species of conservation concern were recorded. Although the screening tool report classifies the site as being of medium plant species sensitivity, no suitable habitat for such species persists on the site and this report found that the likelihood of such species occurring is low. However, any development impeding onto the watercourse buffers may impact on the remaining suitable habitat for such species on the site. A plant species compliance statement is appended to this report (Appendix C).

**Concluding statement**

From a vegetation perspective there is no objection to the proposed development provided that mitigation measures as set out in this report is adhered to as a minimum. In specific, the CBA along the Jukskei River must be avoided. For the continuation of ecosystem services, the secondary grasslands within the ESA1 and ESA 2 should remain connected where possible and maintained as a corridor to the Jukskei River.

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# 1 INTRODUCTION

The Nietgedacht Ext 4 Township is located on Portion 39 of the farm Nietgedacht 535JQ in Gauteng Province (Figure 1). The landowners propose the formalization of existing structures and construction of a church to accommodate 3000 people, an onsite wastewater treatment works for toilets, and parking.

## 1.1 Project locality

The study site is about 14.5ha in extent and is situated about 3.5km southwest of Diepsloot West. The site is located between the N14 highway in the north and the R114 road in the south (Figure 1). A dirt road forms the north-eastern boundary and the Jukskei River forms the most western boundary. The site is within the quarter degree square 2527DD. Figure 2 geographically presents the proposed subdivision into 5 erven.

## 1.2 Screening Tool Sensitivity

The following information pertaining to the site is relevant as detailed by the National Web based Environmental Screening Tool downloaded on 28/03/2025 at 15:04:45.

- The site is classified as '**high terrestrial biodiversity sensitivity'** (Figure 3). The site intersects Ecological Support Areas 1 and 2 (ESAs), and the Jukskei River on the western extent of the site falls within a CBA 1.

- The site is classified as "**medium sensitivity"** for plant species (Figure 4) and indicates that suitable habitat for at least two (2) such species may be present, but there are no confirmed records for the site yet. Therefore, a plant species site verification must be undertaken to confirm the absence or likely occurrence of such species.

As per the Protocol for the Specialist Assessment and Minimum Report Content Requirement for Environmental Impacts on Terrestrial Biodiversity, a terrestrial vegetation assessment, as well as a terrestrial plant species habitat assessment and resulting -compliance statement, as published in the Government Gazette No 43855 on 30 October 2020 in terms of sections24(5)(a) and 25 (5)(h) of NEMA, was undertaken.

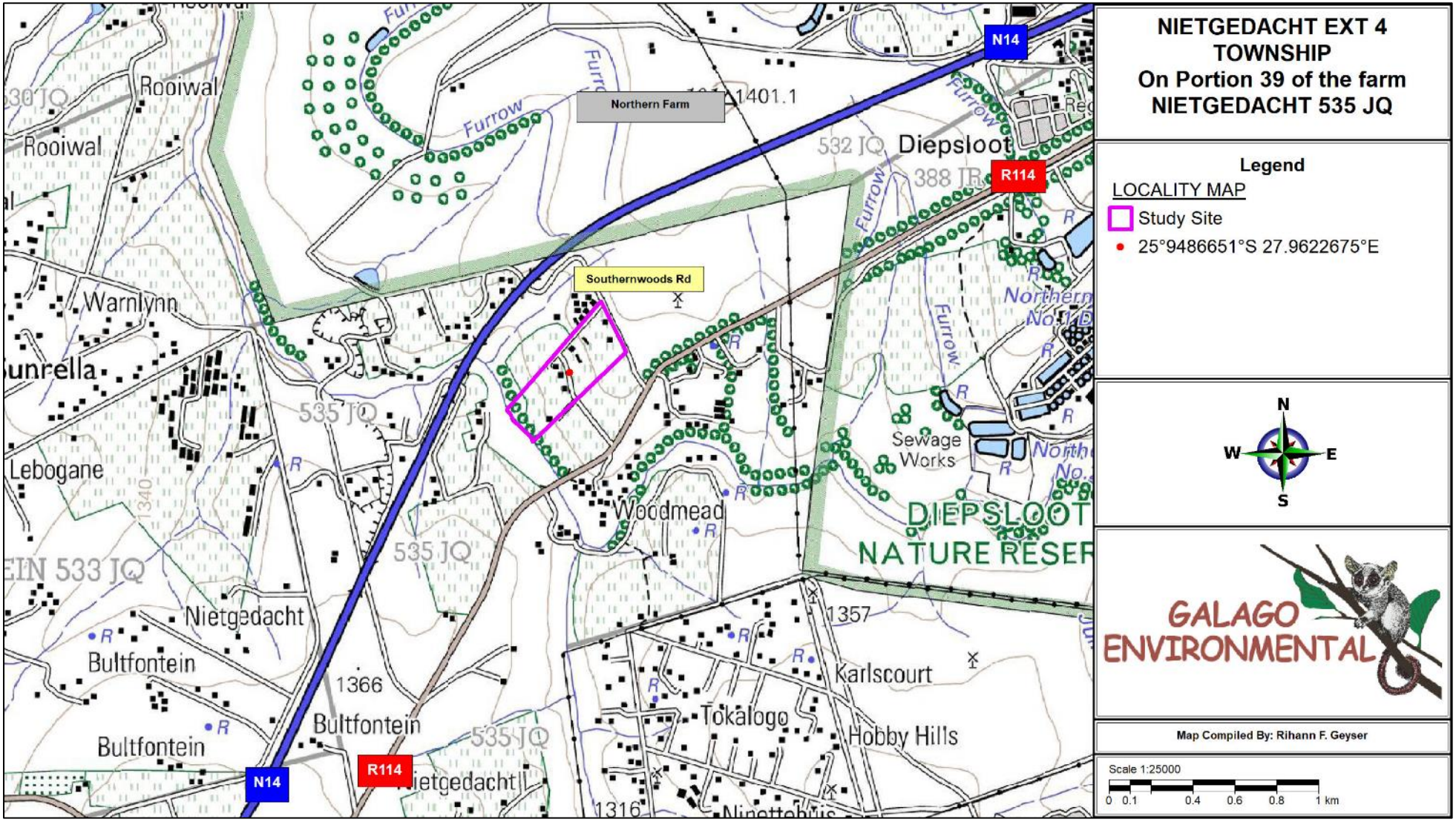


**Figure 1: Locality Map**

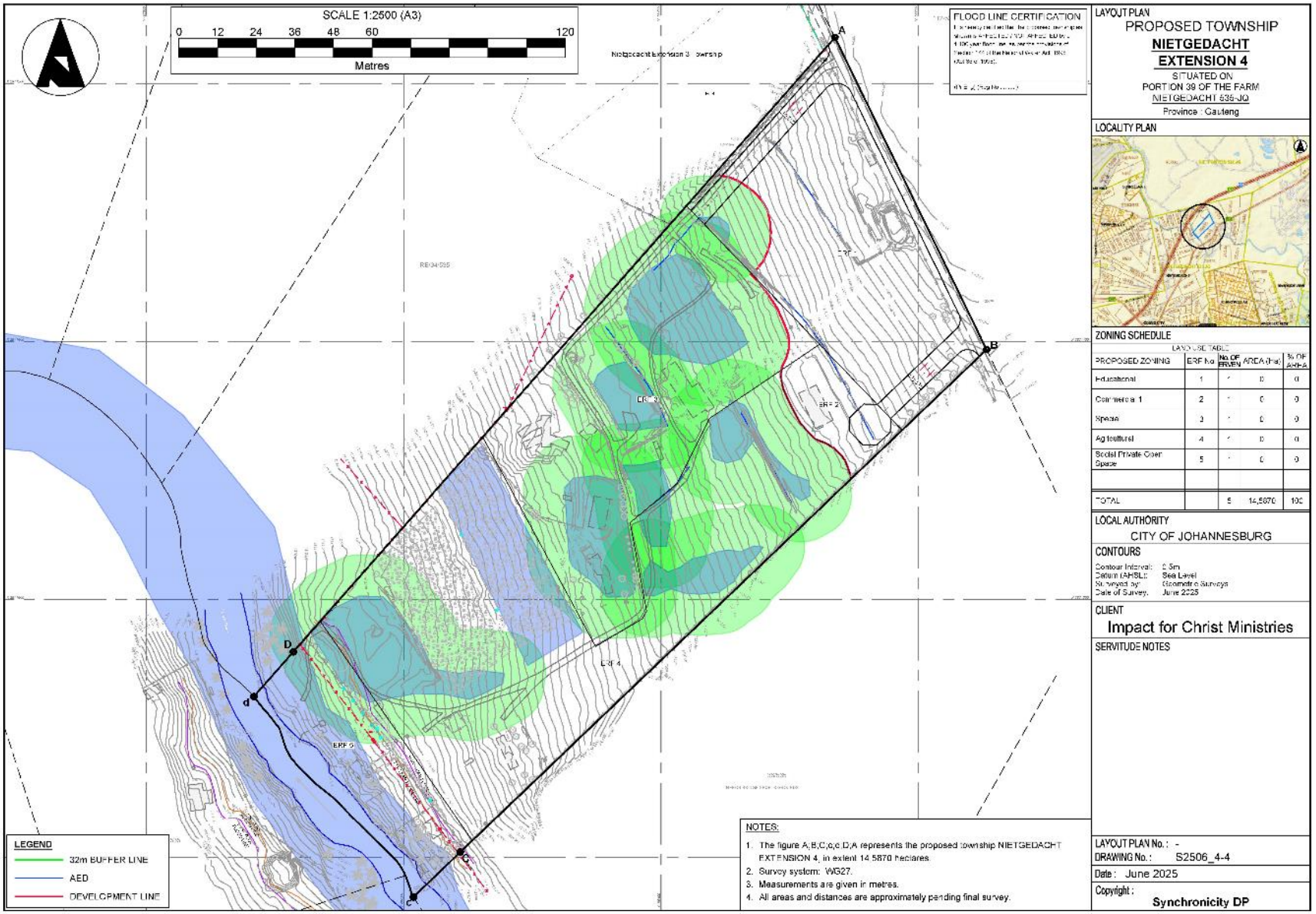


**Figure 2: Proposed subdivision of the study site**

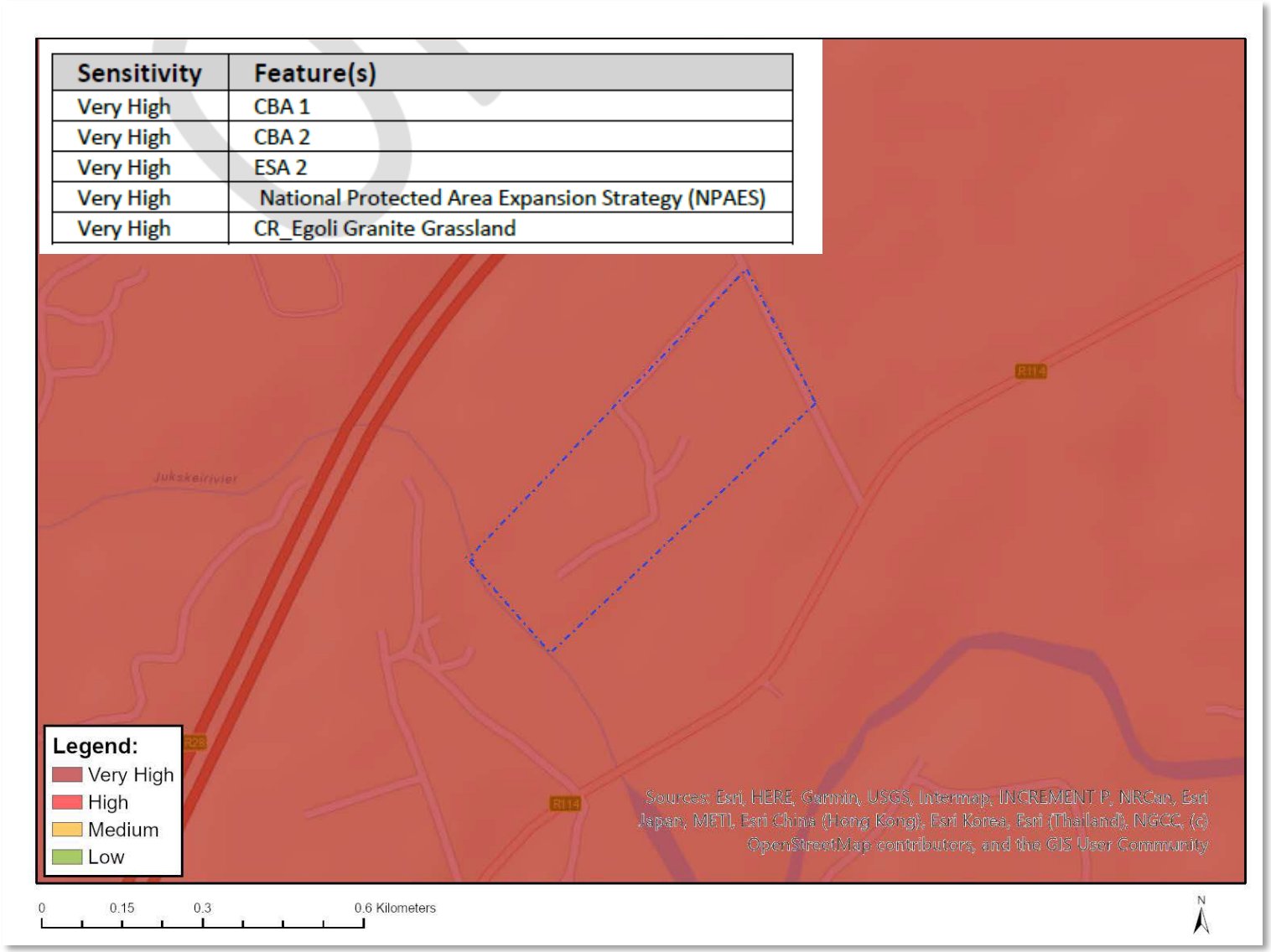


**Figure 3: The site falls within a Very High and High Terrestrial Biodiversity area (screening tool report, downloaded on 28/03/2025 at 15:04:45)**

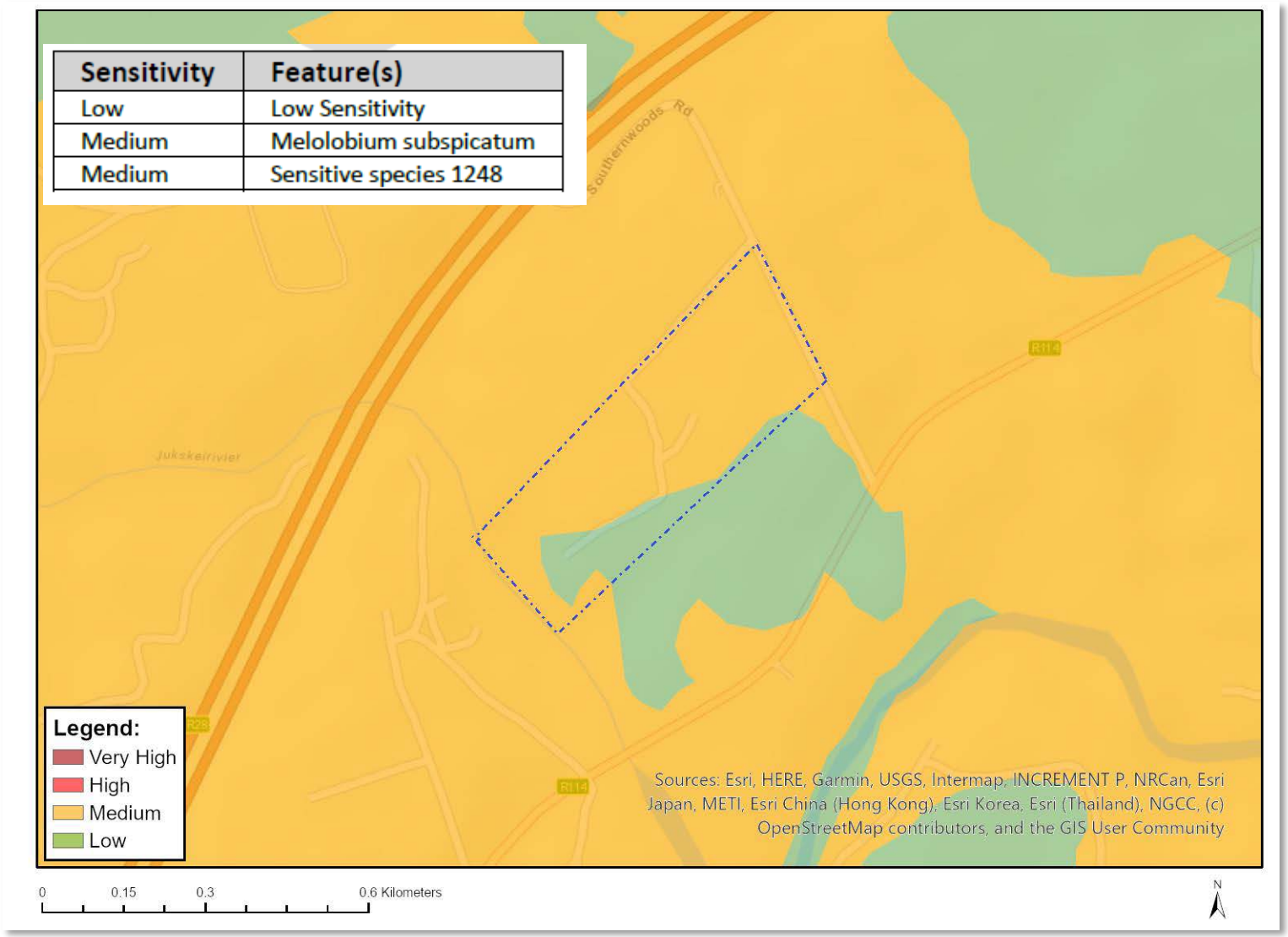


**Figure 4: The site includes areas of medium plant species sensitivity (screening tool report, downloaded on 28/03/2025 at 15:04:45)**

## 1.3 Terms of reference

The vegetation assessment entailed the following:

Complete a terrestrial vegetation assessment in line with the terrestrial biodiversity protocols, including:

- Supply background information on the site relating to conservation plans and threatened ecosystems;
- Field survey to assess the vegetation on and around the site;
- Report and map describing the broad vegetation communities found on the site and its conservation importance and function within the landscape;
- Map indicating ecologically sensitive vegetation groupings; and
- Impact assessment and recommendation to mitigate potential impacts.

Include in the above a plant species site verification report:

- Report and map the habitat for plant species of conservation concern (SCC) for which suitable habitat is present on the site or were confirmed to occur (if any).
- Depending on the results of the general habitat survey for plant SCC, a Plant Species Assessment will be recommended if SCCs or their habitat are recorded. However, the assessment found no suitable habitat or SCCs and a plant species compliance statement is appended to this report.

## 1.4 Assumptions and limitations

The following limitations are applicable, although not considered fatal flaws to the study:

*Seasonality and land use:*

- Vegetation studies should be conducted during the growing season of all plant species that may potentially occur. This may require more than one season's survey with two visits undertaken preferably during November and February. This report relied on a single site visit undertaken on 22 April 2025.
- The site visit was undertaken towards the end of the growing and flowering period. Some species could have been overlooked, not identifiable to species level (e.g., absence of flowers), or already dormant.
- Due to a good rainfall season, the grass layer was dense, and smaller species may have been overlooked.

*General:*

- Even though every care is taken to ensure the accuracy of this report, environmental assessment studies are limited in scope, time, and budget. Discussions and proposed mitigation measures are to some extent made on reasonable and informed assumptions built on *bone fide* information sources, as well as deductive reasoning. Deriving a 100% factual report based on field collecting and observations can only be done over several years and seasons to account for fluctuating environmental conditions and migrations. Since environmental impact studies deal with dynamic natural systems additional information may come to light at a later stage.

# 2 METHODOLOGY

The assessment entailed a literature review, a site survey and reporting. The methodology used is shortly summarised below.

## 2.1 Literature and data review

The description of the regional vegetation relied on literature from Mucina & Rutherford (2006) and the National Biodiversity Assessment of 2018 (SANBI, 2019). Several field guides were used to identify plant species, including Van Wyk & Van Wyk (1997), Van Wyk & Malan (1997), Pooley (1998), Henderson (2001), Van Oudtshoorn (2002) and Bromilow (2010).

*Data and literature consulted:*

- The Gauteng Conservation Plan V4.
- Information on plant species recorded for the Quarter Degree Square ("QDS") that the site is situated in was extracted from the Botanical Database of Southern Africa hosted by South African National Biodiversity Institute ("SANBI") on the new Plants of Southern Africa website (https://posa.sanbi.org). Additional info was sourced from Citizen Science websites such as iNaturalist.org.
- The International Union for Conservation of Nature ("IUCN") conservation status for plant SCC was verified on the website for the Threatened Species Programme, Red List of South African Plants (Red List of South African plants version 2020(http://redlist.sanbi.org/)).
- Threatened Ecosystem data was extracted from the 2018 Nasional Spatial Biodiversity Assessment (NSBA) (Skowno *et al*, 2019), as well as the gazetted 2022 Listed ecosystems (Section 52(1)(a) of the National Environmental Management: Biodiversity Act (Government Gazette 47526, Government Notice 2747, 18 November 2022).
- Historical aerial imagery downloaded from Chief Directorate: National Geospatial Information Geospatial Portal (http://www.cdngiportal.co.za/cdngiportal).
- A short list of plant SCC was derived from the above and the Threatened Species Programme, Red List of South African Plants (Red List of South African plants version 2020(http://redlist.sanbi.org/)) and species listed within the national Screening Tool Report for the site, dated 28/03/2025.

## 2.2 Project Area of Influence (PAOI)

The Project Area of Influence ("PAOI") was defined as per the Species Environmental Assessment Guideline (SANBI, 2020) and is based on the development footprint and the potential extent of the impacts (e.g., edge effects) of the project activities (Figure 5). Therefore, the PAOI is larger than the proposed activities.

- The footprint of the subdivision was regarded as the primary PAOI.
- An area of 200m around the site was viewed and assessed (not formally sampled) as the secondary PAOI.

- Adverse impacts could extend beyond the proposed project area and is referred to here as the tertiary PAOI. Also, tertiary impacts may take place downslope along the Jukskei River and reach further downstream. The extent of impact will depend on the activity and waterflow at the time of the impact and the arrows in Figure 6 are only illustrative.

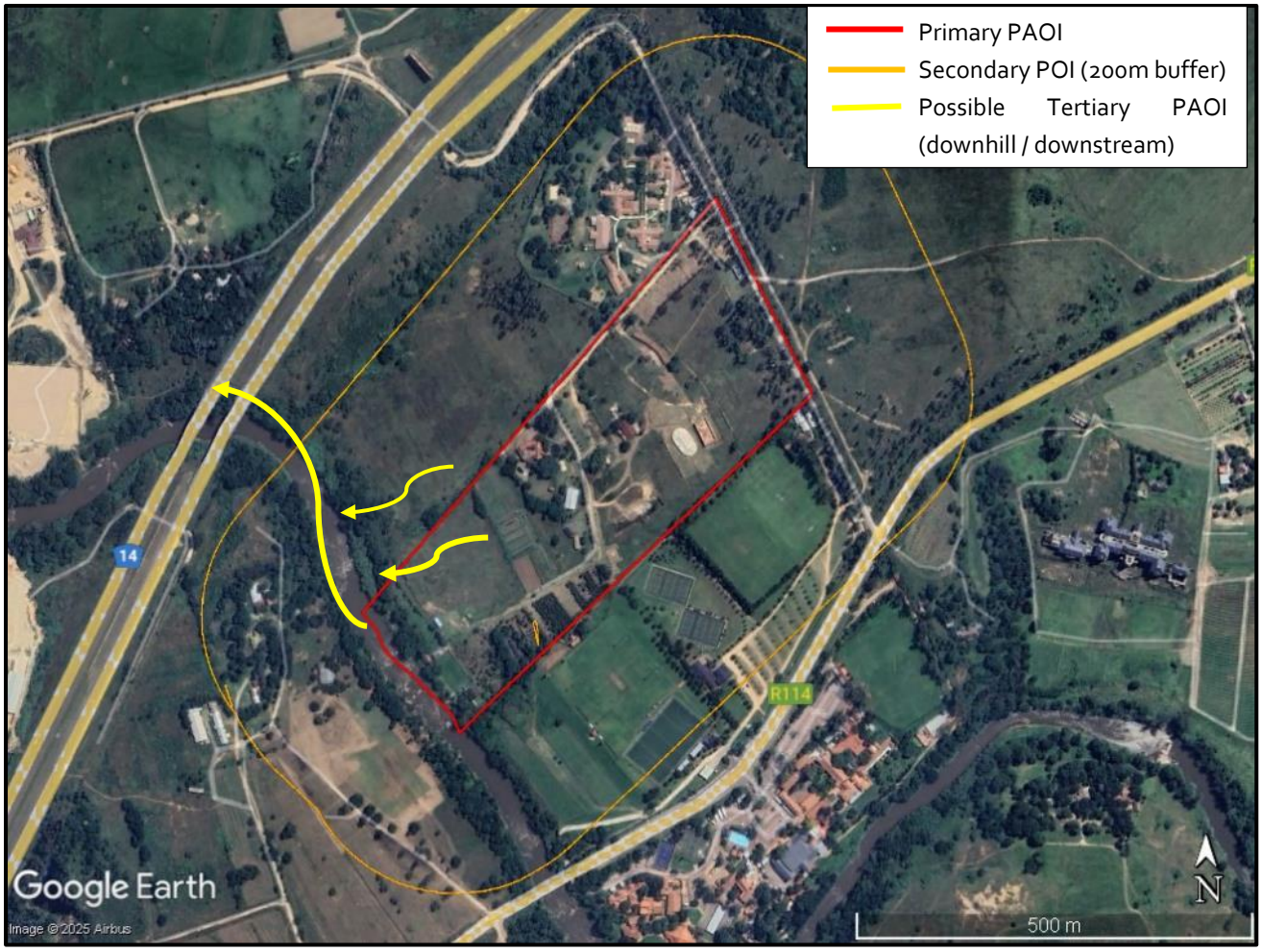


**Figure 5: Project area of influence (PAOI)**

## 2.3 Field survey

Timing and intensity

The site visit was undertaken on 22 April 2025. The area received good summer rainfall prior to the site visit. A sampling and track map is given in Appendix A. Sampling was undertaken mainly within the primary and secondary AOI.

Method

Prior to the site visit, the vegetation was delineated into homogenous units using currently available Google Earth imagery. The field survey focussed on identifying natural and untransformed vegetation, unique features that could indicate local sensitivities such as threatened and protected plants, as well as sensitive ecological features such as rocky areas and wetlands. Transects were walked in accessible areas. At several sites along the transects,

a survey of total visible floristic composition was undertaken. Plant identification and vegetation description relied on species recorded in the sampling points along the walked transects.

## 2.4 Mapping

Mapping was done by comparing georeferenced ground survey data to the visual inspection of available Google-Earth Imagery and in that way extrapolating survey reference points to the entire study area. Delineations are therefore approximate, and due to the intricate mosaics and often gradual mergers of vegetation associations, generalisations had to be made. Mapped associations will thus show where a certain vegetation unit is predominant, but smaller inclusions of another vegetation association in this area do exist but have not been mapped separately. Mapping was extrapolated to the secondary PAOI.

## 2.5 Site Ecological Importance (sensitivity)

The Site Ecological Importance in terms of vegetation is discussed as per the requirements of the recent Species Environmental Assessment Guideline (SANBI, 2020). The assessment criteria and matrices are detailed in Table 1, Table 2, and Table 3.

SEI is 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) as follows:

**SEI = BI + RR**

BI in turn is a function of Conservation Importance (CI) and the Functional Integrity (FI) of the receptor as follows:

**BI = CI + FI**

Conservation Importance (CI) is evaluated in accordance with recognised established internationally acceptable principles and criteria for the determination of biodiversity-related value, including the IUCN Red List of Species, Red List of Ecosystems and Key Biodiversity Areas (KBA; IUCN (2016)).

**Table 1: Criteria for assessing CI, FI and RR. *Modifications from the Species Assessment Guideline is printed in italics***

| Classification | Conservation Importance | Functional Integrity | Receptor Resilience |
|---|---|---|---|
| **Very high** | • Confirmed or highly likely occurrence of CR, EN, VU or Extremely Rare or Critically Rare species<br>• Any area of natural habitat of a CR ecosystem type or large area (> 0.1 % of the total ecosystem type extent) | • Very large (>100 ha) intact area for *Endangered and Vulnerable* conservation status of ecosystem type or >5 ha for CR ecosystem types<br>• High habitat connectivity serving as functional ecological corridors, | • Habitat can recover rapidly (<5 years for >70% of the original species composition and functionality).<br>• Species very highly likely to remain at a site during impact. |

| Classification | Conservation Importance | Functional Integrity | Receptor Resilience |
|---|---|---|---|
| | of natural habitat of an EN ecosystem type | limited road network between intact habitat patches No or minimal current negative ecological impacts with no signs of major past disturbance (e.g. ploughing) | • Species very highly likely to return once the impact ceases. |
| **High** | • Confirmed or highly likely CR, EN, VU species.<br>• 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.<br>• Presence of Rare species.<br>• *Situated in a watercourse as defined by the National Water Act No 36 of 1998 (NWA)** | • *Large intact area for any conservation status of ecosystem type or >10 ha for EN ecosystem types*.<br>• Good habitat connectivity with potentially functional ecological corridors and a regularly used road network between intact habitat patches<br>• Only minor current negative ecological impacts (e.g. few livestock utilising area) with no signs of major past disturbance (e.g. ploughing) and good rehabilitation potential | • Habitat can recover relatively quickly (5-10 years for >70% of the original species composition and functionality.<br>• Species highly likely to remain at a site during impact.<br>• Species highly likely to return to site once impact ceases. |
| **Medium** | • Confirmed or highly likely occurrence of populations of NT species, threatened species (CR, EN, VU)<br>• Any area of natural habitat of threatened ecosystem type with status of VU<br>• Presence of range-restricted species<br>• More than 50 % of receptor contains natural habitat with potential to support SCC.<br>• *Situated within a Strategic Water Source Area** | • Medium (>5 ha but <20 ha) semi-intact area for any conservation status of ecosystem type or > 20 ha for VU ecosystem types<br>• Only narrow corridors of good habitat connectivity or larger areas of poor habitat connectivity and a busy used road network between intact habitat patches<br>• 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 | • Recovers slowly (>10 years for >70 % of the original species composition and functionality<br>• Species moderately likely to remain at site during impact.<br>• Species moderately likely to return to site once impact ceases. |

| Classification | Conservation Importance | Functional Integrity | Receptor Resilience |
|---|---|---|---|
| **Low** | • No confirmed or highly likely SCC.<br>• No confirmed or highly likely range-restricted species.<br>• Less than 50 % contains natural habitat with limited potential to support SCC. | • Small (1 – 5ha) area.<br>• Almost no connectivity but migration still possible across transformed / degraded habitat; very busy surrounds. Low rehabilitation potential.<br>• Several minor and major ecological impacts. | • Unlikely to recover fully (<50% restored) after >15 years.<br>• Species have low likelihood of remaining at site during the impact.<br>• Species have low likelihood of returning to site once impact ceases. |
| **Very low** | • No confirmed and highly unlikely populations of SCC.<br>• No confirmed and highly unlikely populations of range-restricted species.<br>• No natural habitat remaining. | • Very small (<1 ha) area.<br>• No connectivity except for flying species.<br>• Several major current ecological impacts. | • Unable to recover from major impacts.<br>• Species unlikely to remain at site during the impact.<br>• Species unlikely to return once impact ceases. |

** Note that the criteria were customised to include watercourses and Strategic Water Source Areas (SWSA) in the Conservation Importance rating*

**Table 2: Matrix for determining BI**

| **Biodiversity Importance (BI)** | | **Conservation Importance (CI)** | | | | |
|---|---|---|---|---|---|---|
| | | Very High | High | Medium | Low | Very Low |
| **Functional Integrity (FI)** | Very High | **Very High** | **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** |

**Table 3: Matrix for determining SEI**

| **Site Ecological Importance (SEI) (Mitigation)** | | **Biodiversity Importance (BI)** | | | | |
|---|---|---|---|---|---|---|
| | | Very High | High | Medium | Low | Very Low |
| **Receptor Resilience (RR)** | Very Low | **Very High (Avoid)** | **Very High (Avoid)** | **High (Avoid & Minimise)** | **Medium (Minimise & Restore** | **Low (Minimise & Restore** |
| | Low | **Very High (Avoid)** | **Very High (Avoid)** | **High (Avoid & Minimise)** | **Medium (Minimise & Restore** | **Very Low (Minimise)** |
| | Medium | **Very High (Avoid)** | **High (Avoid & Minimise)** | **Medium (Minimise & Restore** | **Low (Minimise & Restore** | **Very Low (Minimise)** |

| Site Ecological Importance (SEI) (Mitigation) | | Biodiversity Importance (BI) | | | | |
|---|---|---|---|---|---|---|
| | | Very High | High | Medium | Low | Very Low |
| | **High** | **High (Avoid & Minimise)** | **Medium (Minimise & Restore** | **Low (Minimise & Restore** | **Very Low (Minimise)** | **Very Low (Minimise)** |
| | **Very High** | **Medium (Minimise & Restore** | **Low (Minimise & Restore** | **Very Low (Minimise)** | **Very Low (Minimise)** | **Very Low (Minimise)** |

The interpretation of the SEI ranks is described in Table 4 below. This table is a supplemented version of that which appears in the Species Environmental Assessment Guideline (SANBI, 2020).

**Table 4: Guidelines for interpreting Site Ecological Importance (SEI) in the context of the proposed development activities.**

| SEI | Interpretation in relation to proposed development activities (SANBI, 2020), with *mitigation added by the specialist* |
|---|---|
| **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.<br>• *Development within these areas is not supported.*<br>• *Impacts are difficult to mitigate, if at all*<br>• *Such features usually protected by legislation or guiding policies* |
| **High** | Avoidance mitigation wherever possible. Minimization 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.<br>• *Development within these areas is undesirable and impacts are difficult to mitigate, if at all.*<br>• *Impacts must be avoided or managed by an ecological management plan* |
| **Medium** | Minimization & restoration mitigation - Development activities of medium impact acceptable followed by appropriate restoration activities<br>• *Development within these areas could proceed, limiting impact to sensitive vegetation, provided that appropriate mitigation measures are taken.*<br>• *High impact developments should be considered with caution, if at all. Development must be restricted in footprint and impacts managed and mitigated by an approved management plan. Edge effects to higher sensitivity classes in its proximity must be mitigated / prevented.* |
| **Low** | Minimization & restoration mitigation - Development activities of medium to high impact acceptable followed by appropriate restoration activities<br>• *Developable areas that are connected to sensitive features.*<br>• *Edge effects must be prevented.* |
| **Very Low** | Minimization mitigation - Development activities of medium to high impact acceptable and restoration activities may not be required<br>• *Most types of development can proceed within these areas with little to no impact on conservation worthy vegetation.*<br>• *Edge effects to other proximate sensitivity classes must be mitigated / prevented.* |

## 2.6 Vegetation / Ecological Condition

Standardised definitions, as recommended by Lexicon for Biodiversity Planning in South Africa by the SANBI were used to describe the state of vegetation and ecological condition (SANBI, 2016). The preliminary condition of the vegetation followed the following definitions:

| | |
|---|---|
| **Natural or near natural:** | An ecological condition class in which composition, structure and function are still intact or largely intact. Can apply to a site or an ecosystem (good ecological condition). Usually of **high** sensitivity to development. |
| **Semi-natural or moderately modified** | An ecological condition class in which ecological function is maintained even though composition and structure have been compromised (Fair ecological condition). Usually of **medium** sensitivity to development |
| **Severely or irreversibly modified** | An ecological condition class in which ecological function has been compromised in addition to structure and composition. Can apply to a site or an ecosystem (Poor ecological condition). Usually of a **low** sensitivity to development. |
| **Good ecological condition:** | An ecological condition class in which composition, structure and function are still intact or largely intact. Can apply to a site or an ecosystem. (Natural or near natural). Usually of **high** sensitivity to development. |
| **Fair ecological condition** | An ecological condition class in which ecological function is maintained even though composition and structure have been compromised (Moderately modified, semi-natural). Usually of **medium** sensitivity to development. |
| **Poor ecological condition** | An ecological condition class in which ecological function has been compromised in addition to structure and composition. Can apply to a site or an ecosystem (Severely or irreversibly modified). Usually of a **low** sensitivity to development. |

# 3 BASELINE DESCRIPTION OF THE SITE

## 3.1 Climate

The site falls within the summer rainfall region of South Africa, with most rain falling between November and March (Figure 6) (www.meteoblue.com). Average annual precipitation ranges between 600 and 800 mm (Mucina and Rutherford, 2006). Winters are very dry, and frost is common. Average summer temperature can reach up to 27 °C, with the average winter temperatures dropping to about 11 °C.

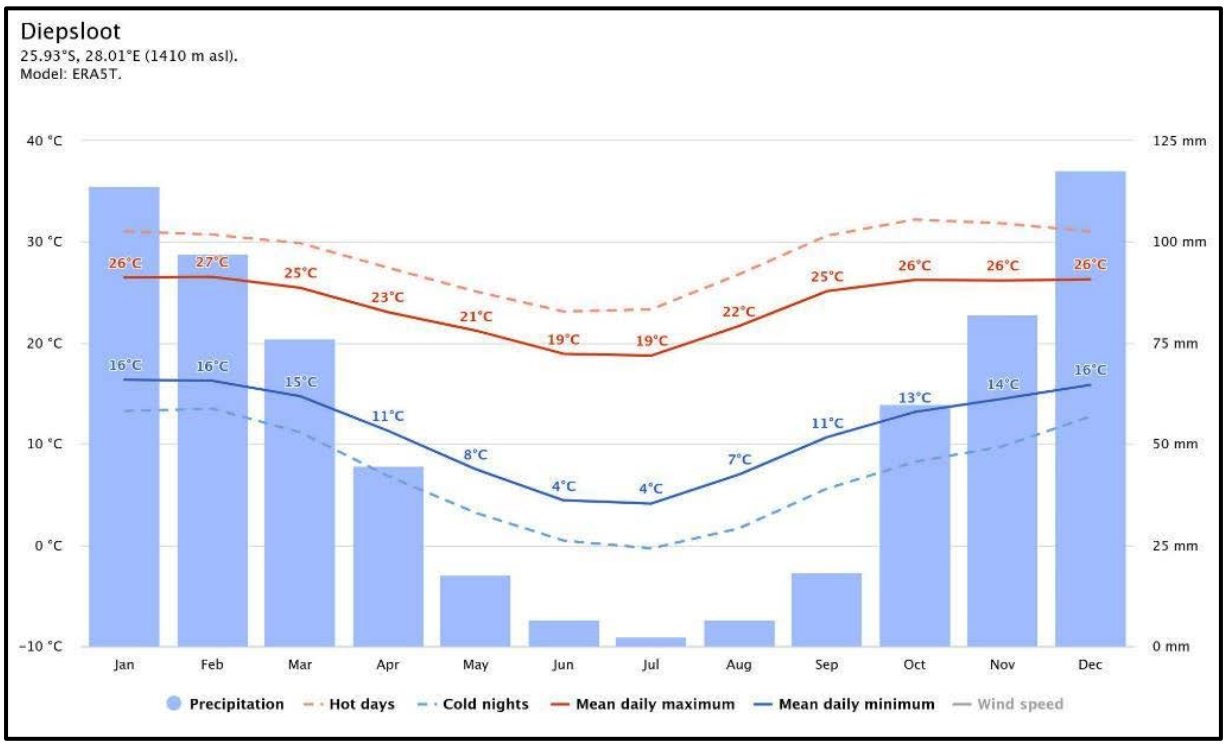


**Figure 6: Average temperatures and precipitation for the Diepsloot area (meteoblue.com)**

## 3.2 Geology and Soils

Archaean granite and gneiss of the Halfway House Granite underlies the area, leading to soils derived from these sources that are light brown, shallow and freely drained on the upland areas, with somewhat darker clayey soils in the bottomlands along the watercourses (Mucina & Rutherford, 2006).

## 3.3 Topography and Hydrology

The site slopes south-westward towards the Jukskei River. The highest point is on the north-eastern boundary along the dirt road at an elevation of 1354m dropping to 1310 along the Jukskei River (Figure 7).

## 3.4 Strategic Water Source Areas (SWSA)

Eight percent (8%) of South Africa's land area produces 50% of our surface water. If we can protect this 8%, we will go a long way to ensuring a water secure future for South Africa (WWF, 2013). Strategic Water Source Areas (SWSAs) are landscapes where a relatively large volume of runoff produces water for the majority of South Africa. Strategic water source areas can be regarded as natural 'water factories', supporting growth and development needs that are often a far distance away. Deterioration of water quality and quantity in these areas can have a disproportionately large negative effect on the functioning of downstream ecosystems and the overall sustainability of growth and development in the regions they support (Nel *et al.,* 2013).

According to Le Maitre *et al*. (2018), the project is not located within a Strategic Water Source Area. The Westrand Karst Belt and the Eastern Karst Bel SWSA is situated about 10km north of the site.

## 3.5 Overview of the Regional Vegetation type

The study site is situated within the Grassland Biome of South Africa. This biome is dominated by grasslands wherein high summer rainfall, combined with dry winters, night frost and marked diurnal temperature variations are unfavourable to tree growth. Most plant species in grasslands are non-grassy herbs (forbs), most of which are perennial plants with large underground storage structures. Furthermore, many Rare and Threatened plant species in the summer rainfall regions of South Africa are restricted to high-rainfall grasslands, making the Grassland Biome in most urgent need of conservation.

The Grassland Biome can be divided into smaller units known as vegetation units. The whole project area falls within the Egoli Granite Grassland vegetation unit (Mucina & Rutherford, 2006). Undisturbed Egoli Granite Grassland comprises climax grass species with a patchy dominance and a high diversity of forbs (an herbaceous plant other than grasses).

The pressures for land in Gauteng lead to degradation and disturbances within the Egoli Granite Grasslands. The Egoli Granite Grasslands is poorly conserved and is classified as endangered, indicating that it is facing a high risk of extinction soon (Golding, 2002). Little Egoli Granite Grassland is still in good condition and remnants of this vegetation unit is thus of high conservation value and was a focus during the field survey.

## 3.6 Listed Ecosystems

According to the 2022 Revised National List of Threatened Ecosystems, the remaining extent of Egoli Granite Grassland is classified as Critically Endangered (Government Gazette 47526, Government Notice 2747, 18 November 2022). Egoli Granite Grassland is narrowly distributed with high rates of habitat loss in the past 28 years (1990- 2018), placing the ecosystem type at risk of collapse.

Although the site falls within the historic extent of Egoli Granite Grassland, the site and surrounds have historically been ploughed and the according to the National Biodiversity

Assessment (NBA) 2018, the site **does not** fall within remnants of the Egoli Granite Grassland (Figure 8).

## 3.7 Gauteng Conservation Plan

The Gauteng Conservation Plan (Version 4) (Desmet, *et al* 2024) assessed the biodiversity in the province and classified the province in terms of Critical Biodiversity Areas (CBA's) and Ecological Support Areas (ESA's), as well as Protected Areas (Desmet *et al,* 2024). Critical Biodiversity Areas (CBAs) are the sites that are required to meet the region's biodiversity targets and need to be maintained in a natural condition to safeguard identified biodiversity features. Ecological Support Areas (ESAs) are classified as areas that are important for ensuring persistence and to provide intact mega-pathways for long-term biological movement, and they are selected primarily along river lines and altitude gradients to provide for the natural retreat and advance of plants and animals in response to environmental change.

As per Figure 9, the project area in the west (along the Jukskei River) falls within a CBA 1. CBA1 represents irreplaceable sites where no other options exist for meeting targets for biodiversity features. An ESA 2 extents through the site to an ESA 1 in the north-eastern corner of the site. ESA1 being in a largely natural state, while ESA2's are no longer intact but potentially retain significant importance from a process perspective (e.g., maintaining landscape connectivity).

In an ESA:

- Avoid additional / new impacts on ecological processes.
- Maintain current land use. Avoid intensification of land use, which may result in additional impact on ecological processes.

Compatible land uses:

- Existing activities (e.g., arable agriculture) should be maintained, but where possible a transition to less intensive land uses or ecological restoration should be favoured.

As each planning unit in the Conservation Plan is uniform in size (4ha) and may contain multiple land cover types, it is important to note that the CBA classification generally only applies to the natural, secondary or cropland portion of a planning unit and not necessarily the whole planning unit (Desmet, et al 2024). Note that the ESA2 category comprises almost entirely croplands. This is consistent with the definition of the ESA2 category.

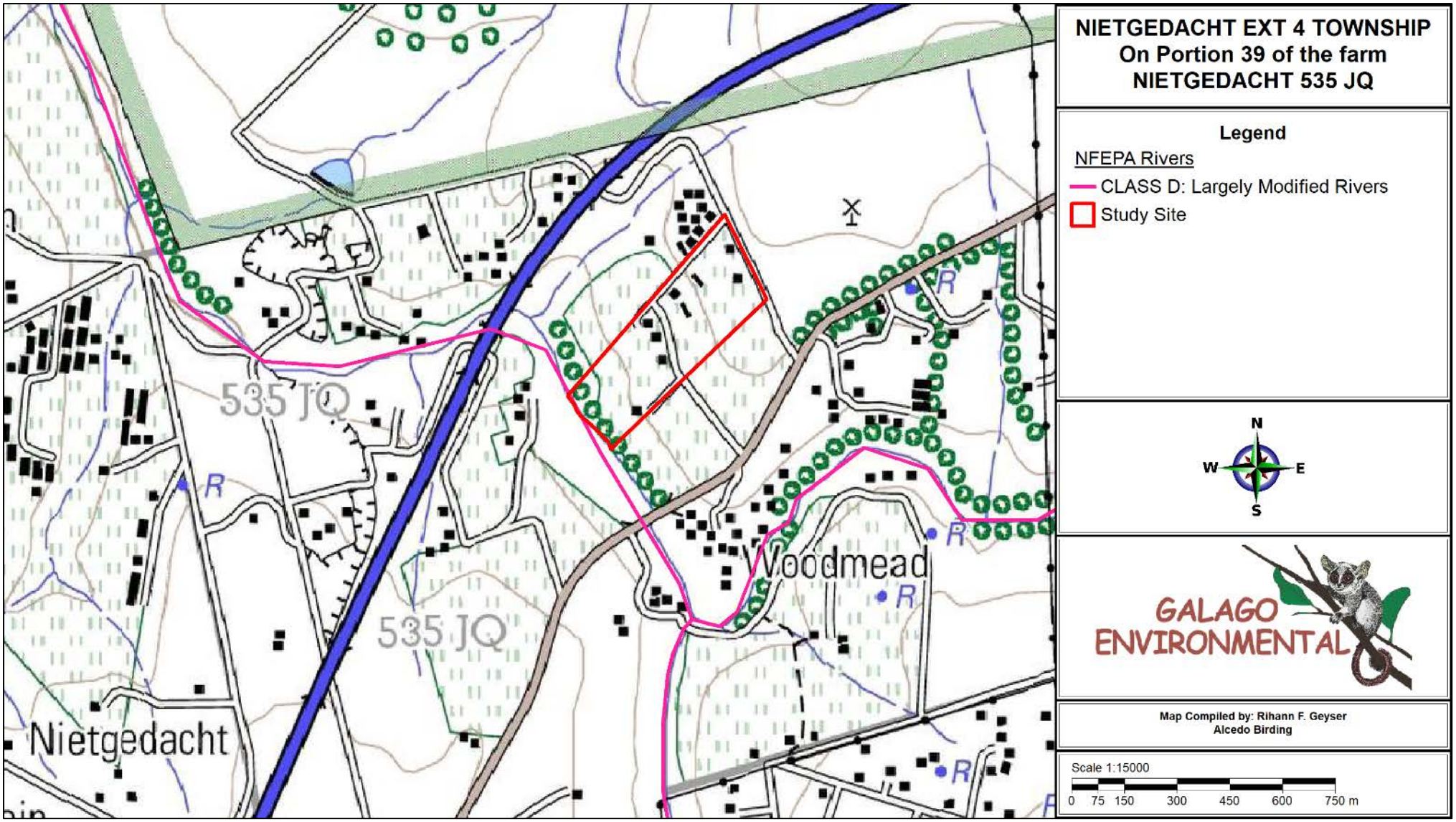


**Figure 7: Hydrology of the area that the site is situated in.**

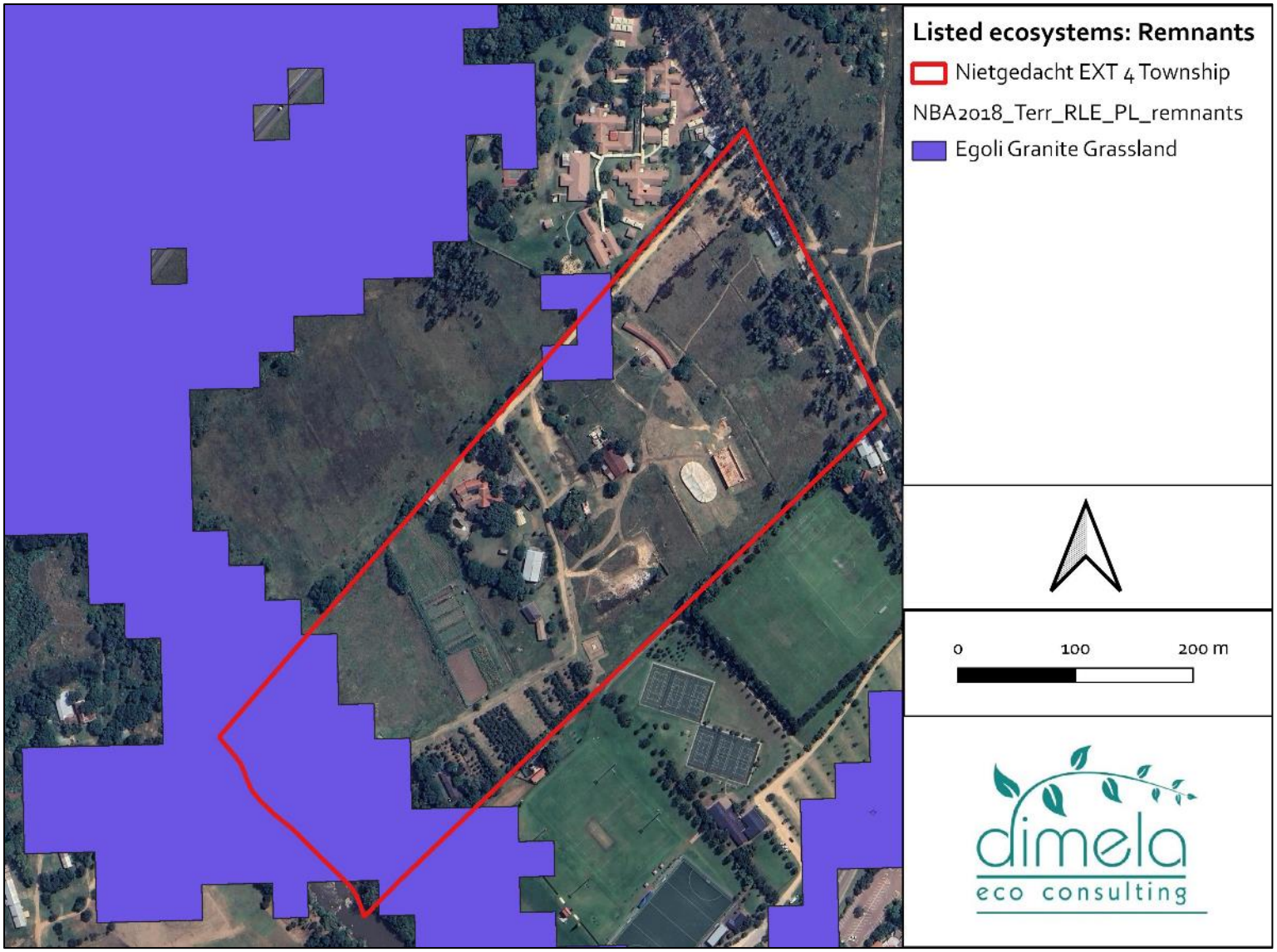


**Figure 8: Listed ecosystems map, remaining extent**

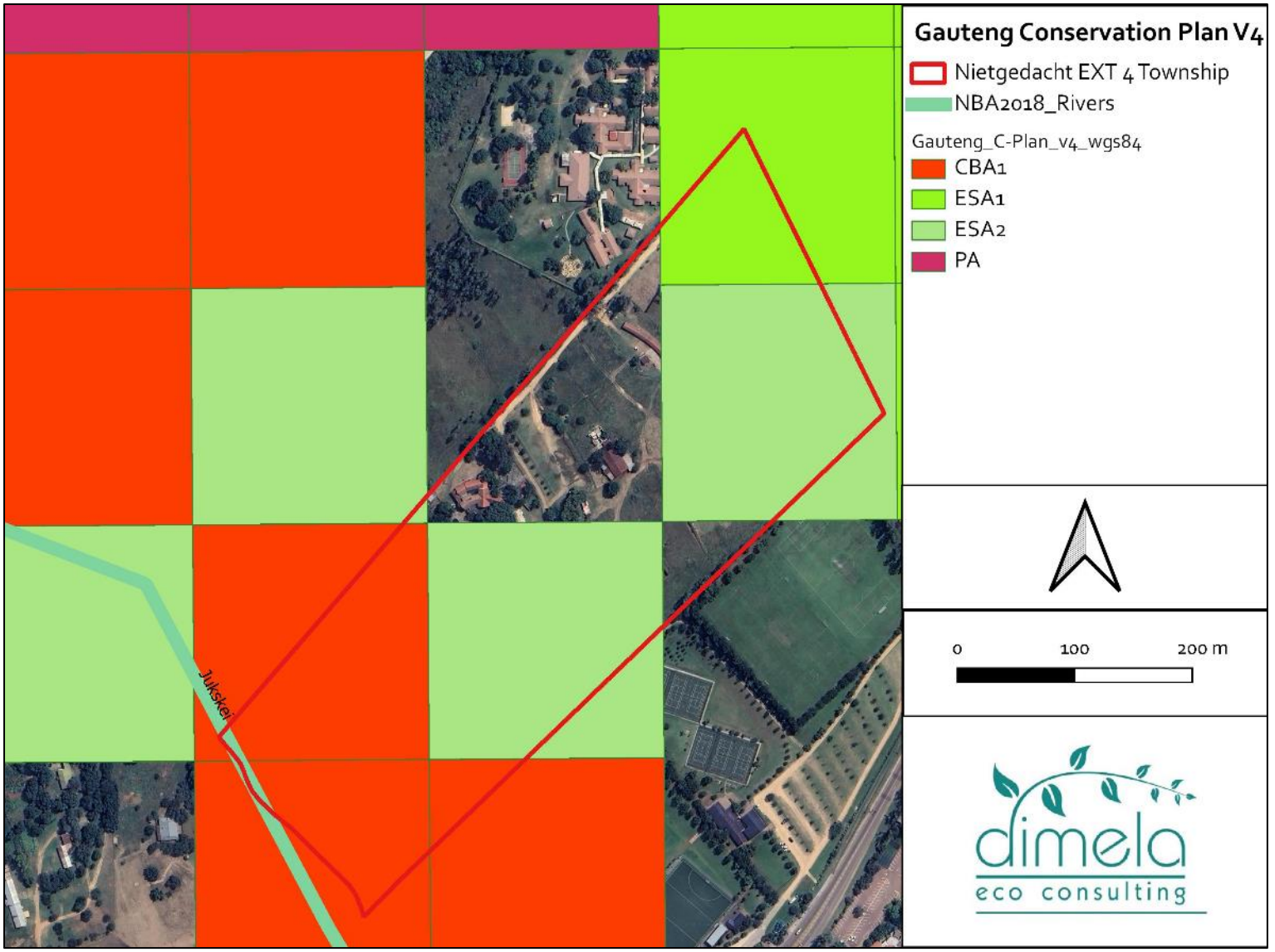


**Figure 9: Gauteng Conservation Plan, V4 map**

## 3.8 Ecological drivers and processes in bushveld

Frost, fire and grazing maintain the herbaceous grass and forb layer and prevent the establishment of thickets or encroachment by trees into grasslands (Tainton, 1999). Fire is a natural disturbance caused by lightning, and regular burning is therefore essential for maintaining the structure and biodiversity of grasslands. If fire is prevented due to activities such as agriculture and mining, the vegetation structure degrades, and alien species could eventually dominate the natural vegetation.

When Egoli Granite Grassland vegetation is disturbed, *Hyparrhenia hirta* (common thatching grass) becomes the dominant grass and the forb diversity decreases (Bredenkamp *et al*, 2006). The degradation occurs easily resulting in a change from the climax vegetation (high species diversity) to an anthropogenic *Hyparrhenia hirta* dominated vegetation type with low species diversity. It is unlikely that disturbed and transformed Egoli Granite Grassland will return to the original climax vegetation (Bredenkamp *et al*, 2006).

# 4 RESULTS OF THE ASSESSMENT

## 4.1 Land use and land cover of the project area

### 4.1.1 Historic aerial and satellite imagery

Historic aerial imagery of the year 1996 was sourced from the Chief Directorate: National Geospatial Information Geospatial Portal (http://www.cdngiportal.co.za/cdngiportal), and shows that at that time the site, as well as land to the north, east and south were extensively cultivated (Figure 10).

**Figure 10: A 1996 aerial image (Chief Directorate: National Geospatial Information Geospatial Portal) of the estimated site area**

More recent Google Earth satellite imagery dated 2008 shows the infrastructure present on the site, as well as the historically ploughed grassland (Figure 11). Sportsfields were being constructed to the south, while the vegetation north of the site was also historically cultivated.

By the year 2015, a dam was constructed on the western extent of the site, along the Jukskei River (Figure 11). The area east of the dam also included greenhouses and grass bales were stored alongside the dam. It is likely that the site was historically planted with pasture. Several cutoff drains can be seen and was verified during the site verification.

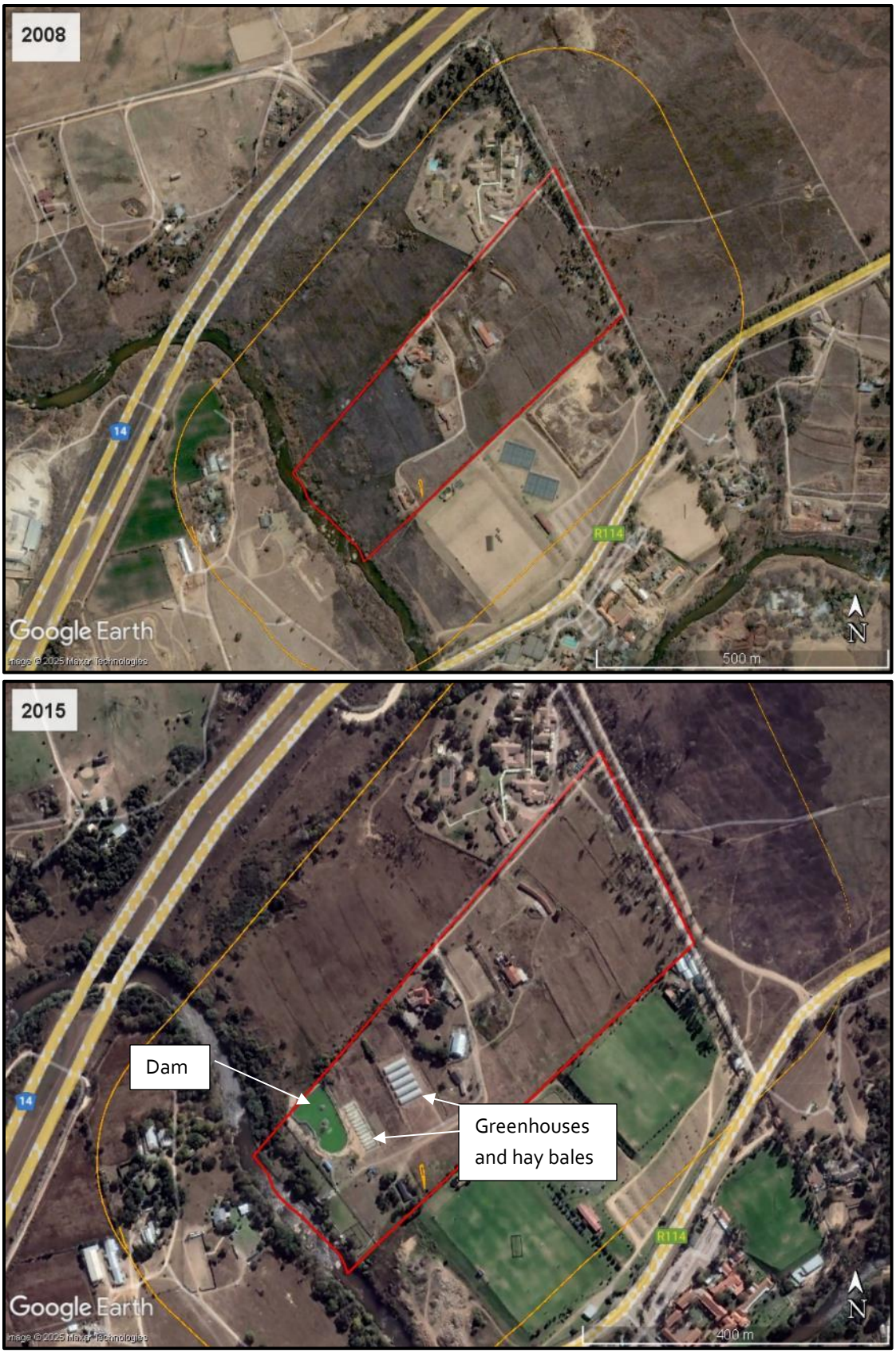


**Figure 11: Google Earth satellite imagery of the site in 2008 and 2015**

By the year 2019, the dam was filled in and rows of planted trees are visible on the southern boundary (Figure 12). Also, a waterfilled pit or disused query is present. No further cultivation took palce on the site.


**Figure 12: Google Earth Satellite imagery of the site in the year 2019**

### 4.1.2 Site verification and land use

At the time of the site visit on 22 April 2025, no large-scale cultivation was taking place on the site or adjoining properties. From the grass species present, it seems that the site was historically planted with pasture. In order to keep areas dry, several cut-off drains were constructed. Several buildings are present, including a main farmhouse, several outbuildings a tented church and a venue with mowed lawns along the Jukskei River (Photo plate 1).

Cultivation of vegetables takes place about mid-section of the site and planted trees (mainly *Searsia lancea* and *Combretum erythrophyllum* species) form an arboretum along the southern boundary of the site (Photo plate 2).


**Photo plate 1: a) Historic foundations and b-d) staff quarters and dumped soil on the eastern extent of the site, e-f) a venue and mowed lawns along the Jukskei River on the western extent of the site**


**Photo plate 2: a-b) Cultivation of vegetables on the site, c-d) planted trees along the eastern boundary and e) typical cutt-of drains noted on the site**

## 4.2 Vegetation recorded during this assessment.

The vegetation on the site comprised secondary grassland with numerous localised disturbances. No natural or good condition grassland was recorded on or adjacent to the site. The vegetation groups and subgroups were classified by this assessment as follows:

Vegetation on the site:

1. Transformed, severely modified land
2. Secondary grassland
3. *Eucalyptus* dominated secondary grassland
4. Moist grassland
5. Riparian vegetation

Each broad vegetation group is discussed below and geographically represented in Figure 14. Plant species that were recorded within each vegetation group at the time of the site visit are listed in Appendix B.

Vegetation within 200m of the site:

The surrounding land was assessed from aerial imagery and data gathered from fence lines and a drive through the area east of the site. The following vegetation groups were extrapolated:

1. Transformed, severely modified land including sportsfields
2. Secondary grassland
3. Moist grassland
4. Riparian vegetation

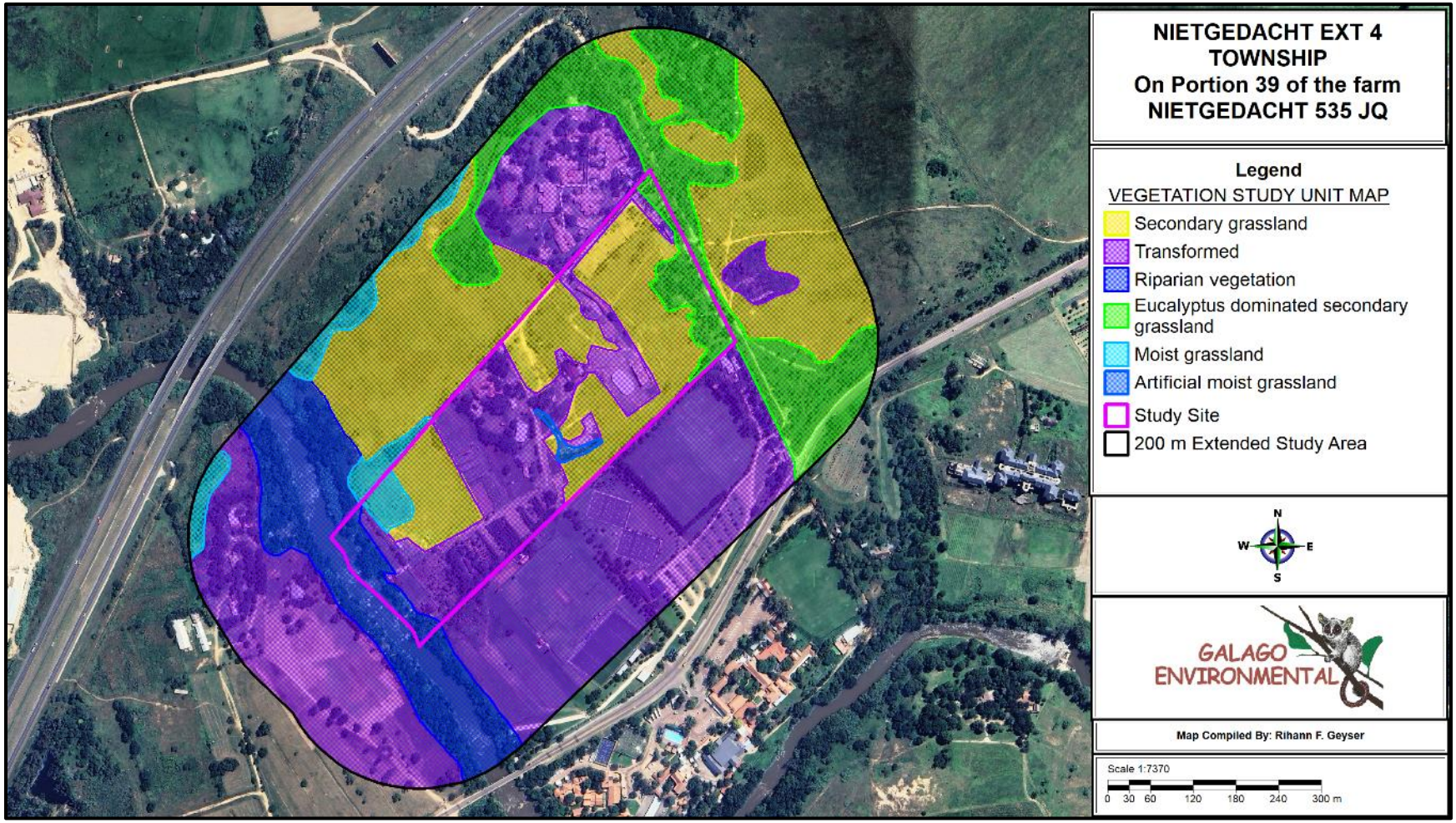


**Figure 13: Vegetation groups within the project area**

### 4.2.1 Transformed and severely modified land

Modified land refers to an ecological condition class in which the ecosystem has been modified completely, with an almost complete loss of composition and structure. All or most ecosystem function has been destroyed, and the changes are irreversible. Such land is therefore in a poor ecological condition.

On site, the modified land comprises the existing buildings, surrounding gardens and mowed lawns, vegetable gardens as well as the planted trees along the southern boundary (Photo plate 1 & 2). These areas are not further discussed.

### 4.2.2 Secondary *Hyparrhenia hirta-Eragrostis curvula* grassland

Secondary grasslands develop where the original, undisturbed grassland vegetation was removed (e.g., by cultivation). After such disturbances cease, pioneer grassland species, as well as weedy pioneer plants, colonise the fallow lands leading to a pioneer grassland state with a much lower initial species diversity as opposed to the primary (climax) state prior to any disturbances. In the absence of further disturbances, the grassland could reach a secondary grassland state (more diverse and ecologically stable than pioneer grassland, yet much lower in species diversity than primary grassland) and theoretically the primary state over time. However, primary grasslands are species rich ecosystems, which once disturbed, are difficult, if not impossible to restore.

Opposed to a mosaic of climax grass species with a patchy dominance and a high diversity of forbs that is typical of good condition Egoli Granite Grassland, the following contributed to the secondary classification of the grassland:

- Historic cultivation of the site and continuous impacts such as mowing.
- The dominant grass on much of the site were *Eragrostis curvula* (weeping love grass), *Melinis nerviglumis* and *Cynodon dactylon* (couch grass), with patches of *Eragrostis plana* in moist depressions. It is assumed that the site was historically planted with pasture that was baled or directly grazed.
- The grass *Aristidia congesta*, which tends to proliferate under disturbance or intense grazing, were also common.
- Furthermore, the grass *Hyparrhenia hirta* (common thatching grass) formed dominant patches. Dominance of this grass is characteristic of degraded Egoli Granite Grassland. As per Bredenkamp *et al,* (2006), the granitically derived shallow nutrient poor soils of the area are sensitive and intolerant to frequent impacts such as heavy grazing, ploughing, trampling and general domestic activities. The degradation occurs easily resulting in a change from the climax (high species richness) vegetation to an anthropogenic *Hyparrhenia hirta* (low species richness) dominated vegetation type.
- An exceptionally low indigenous forb richness.

Secondary grassland and planted pasture comprise an ecological condition class in which ecological function is maintained even though composition and structure have been compromised.

The secondary vegetation has undergone modification and a fundamental shift from the original state (Photo plate 3).

**Photo plate 3: Secondary grassland on the site**

Table 5 below gives a list of the most dominant and prominent species in the *Hyparrhenia hirta* – *Eragrostis curvula* secondary grassland. Only ten (10) indigenous forb species were recorded

within the secondary grassland at the time of this assessment. This is low compared to what is expected in Egoli Granite Grassland.

**Table 5: Summary of the prominent and dominant species recorded within the secondary grassland (Appendix B)**

| **Dominant taxa recorded** |
|---|
| Grasses: *Eragrostis curvula, Hyparrhenia hirta, Cynodon dactylon, Andopogon schirensis, Aristida congesta, Melinis repens, Eragrostis plana*<br>Herbaceous plants: *Solanum panduriforme, Selago densiflora, Helichrysum rugulosa, Oldenlandia herbacea*<br>Shrubs: *Stoebe plumosa* |
| **Species richness (indigenous species) at the time of the site visits** |
| Grasses: 11 Forbs:10 |
| **Protected or threatened plant species** |
| None observed in walked transects and likelihood of occurring is low. |
| **Alien and/or invasive plant species** |
| Category 1b invasive species recorded:<br>• *Campuloclinium macrocephalum (*Pom-Pom weed)<br>• *Verbena brasiliense* |
| **Sensitive ecological features** |
| The vegetation was in a secondary and degraded state with continuous edge effects and disturbances.<br>• The vegetation is modified from the reference state of Egoli Granite Grassland.<br>• No habitat to SCC as listed in Appendix C.<br>• Functional as groundwater recharge zones. |

### 4.2.3 *Eucalyptus* dominated secondary grassland

*Eucalyptus camalduensis* (bluegum) dominated the eastern boundary of the site and stretched onto adjoining properties (Photo plate 4). These trees were historically planted along the roads in the area as avenues and is already visible in the 1996 aerial image depicted in Figure 10. The trees seemingly spread into surrounding disturbed soils.

This vegetation group included several localised disturbances such as old building foundations, mowed lawns, and dumped soil. A number of alien invasive plant species were recorded (*Mirabilis jalapa, Salvia tiliifolia, Zinnea peruviana*) and limited indigenous forbs (*Gomphocarpus fructicosus, Helichrysum rugulosum, Selago densiflora*).

The grassland was secondary in nature dominated by grasses such as *Melinis repens, Hyparrhenia hirta,* and *Eragrostis plana* (Table 6)*.* The vegetation is in a modified state, but ecological function is mostly maintained.

**Photo plate 4: *Eucalyptus* dominated secondary grassland**

**Table 6: Summary of the prominent and dominant species recorded within the *Eucalyptus* dominated secondary grassland (Appendix B)**

| **Dominant and abundant taxa recorded** |
|---|
| Dominant tree: *Eucalyptus cf camalduensis*<br>Grasses: *Eragrostis* species*, Cynodon dactylon, Panicum maximum, Melinis repens, Urochloa mosambicensis, Heteropogon contortus*<br>Herbaceous plants / forbs: *Gomphocarpus fructicosus, Selago densiflora, Verbena tenuisecta* |
| **Species richness (indigenous species) at the time of the site visit** |
| Total indigenous species recorded in walked transects: **31**<br>Grasses: 8, Forbs:9 |
| **Protected or threatened plant species** |
| None observed in walked transects and likelihood of occurring is low. |
| **Alien and/or invasive plant species** |
| Category 1b invasive species recorded:<br>• *Mirabilis jalapa*<br>• *Salvia tiliifolia* |
| **Sensitive ecological features** |

The vegetation was in a secondary and degraded state with continuous edge effects and disturbances.

- The vegetation is modified from the reference state of Egoli Granite Grassland
- No habitat to SCC as listed in Appendix C
- Functional as groundwater recharge zones

### 4.2.3 Moist grassland

Egoli Granite Grassland is named after the underlying geology. Due to the impervious granite, water cannot penetrate through the granite and therefore form perched water tables in flattish areas. Against slopes, subsurface water flow takes place along the granite layer and where the granite is near the surface, the water seep out. The area that the site is situated in is thus known for subsurface flow of water and numerous seepage areas. These areas are characterised by vegetation adapted to grow in inundated or moist grasslands for at least a couple of months a year.

Note that the moist grasslands is an indication of where wetlands could occur. However, the wetland assessment for the project must be consulted for the delineated boundaries and buffers of wetlands. Two moist grassland areas were identified of which one is likely artificial in nature, while the other used to form part of the dam that can be seen on the 2015 Google Earth satellite imagery depicted in Figure 11. The wetland assessment report must be consulted for the definitive explanation and delineation of wetlands on the site.

The secondary grassland includes several moist depressions dominated by the grass *Eragrosits plana*. These are assumed to be due to historic cultivation of the land. However, abut mid section of the site, what is believed to be an artificial wetland was noted. This area also includes an historic quarry that is currently used as a dump site and the southern extent was inundated by water and colonised by the reed *Typha capensis* (Photo plate 5). North thereof, stands of the grass *Imperata cylindica* (cotton wool grass), which prefers moist conditions, was recorded, with some reed such as *Typha capensis* and *Cyperus congestus.*

**Photo plate 5: A historic quarry with the reed *Typha capensis* in permanently inundated areas (left), and dominant stands of the grass *Imperata cylindrica* to the north thereof (right)**

Another potential wetland area was noted along the northern boundary in the western extent of the site. A dense tree layer, dominated by alien invasive plant species colonised the fence line on the northern boundary, from where water seem to seep westward to the Jukskei River (Photo plate 6). The water seeps through a stand of the grass *Phragmites australis* (common reed). Other grasses included *Setaria* species, *Cynodon dactylon* and *Paspalum dilatatum* (Table 7). No indigenous forbs were noted at the time of the site assessment; however, a high number of alien invasive plant species were recorded.


**Photo plate 6: Invasive tree species on the northern boundary of the site from where water seem to seep westward to the Jukskei River (top images) and the grass Phragmites australis in a moist grassland situated between the invasive trees and the Jukskei River (below images)**

The area where a dam was historically constructed included standing water at the time of this assessment. Grasses dominated and included some *Imperata cylinderica, Sporobulus africanus*, and the sedges *Cyperus congestus* and *Kyllinga erecta.*

**Photo plate 7: Moist grassland where the historic dam used to be**

**Table 7: Summary of the prominent and dominant species recorded within the moist grassland (Appendix B)**

| **Dominant and abundant taxa recorded** |
|---|
| Grasses: *Eragrostis* species*, Cynodon dactylon, Setaria incrassata, Sporobulus africanus, Imperata cylindrica, Phragmites australis, Paspalum dilatatum*<br>Sedges: *Typha capensis, Kyllinga eracta, Cyperus congesta -* |
| **Species richness (indigenous species) at the time of the site visit** |
| Total indigenous species recorded in walked transects: **31**<br>Grasses: 12, Forbs:3 Sedges: 5 |
| **Protected or threatened plant species** |
| None observed in walked transects and likelihood of occurring is low. |
| **Alien and/or invasive plant species** |
| Category 1b invasive species recorded:<br>• *Ipomoea purpurea*<br>• *Arundo donax*<br>• *Morus alba*<br>• *Melia azedarach*<br>• *Tamarix ramosissima*<br>• *Verbena brasiliensis* |
| **Sensitive ecological features** |
| The vegetation was in a secondary and degraded state.<br>• The vegetation is modified from the reference state of Egoli Granite Grassland<br>• No habitat to SCC as listed in Appendix C<br>• Functional as groundwater recharge zones. Refer t the wetland report for the definitive wetland boundaries. |

### 4.2.4 Riparian vegetation

The vegetation along the Juskei comprised a tall tree layer including indigenous trees such as *Celtis africana,* (white stinkwood), *Vachellia karroo* (sweet thorn)*, Combretum erytrohyllum* (river bushwillow) and *Gymnosporia buxifolia* (Photo plate 7; Table 8)*.* Several invasive tree species such as *Melia azedarach* (syringa), *Morus alba* (mulberry) and the shrub *Cestrum laevigatum* (inkberry) were also present. Most of the grass layer was mowed as lawn around the existing venues on the riverbank and limited indigenous forb species were present.

Although much of the indigenous tree layer that was expected were recorded, the natural ground layer of grass and forb species were lacking. However, the vegetation retains a functional role in soil stabilisation and was in a natural to near-natural state.

**Photo plate 8: Vegetation on the site along the Jukskei River**

**Table 8: Summary of the prominent and dominant species recorded within the riparian vegetation (Appendix B)**

| **Dominant and abundant taxa recorded** |
|---|
| Dominant treea: *Celtis africana, Combretum erytrohyllum, Gymnosporia buxifolia, Searsia pyroides*<br>Grasses: *Cynodon dactylon, Panicum maximum, Melinis repens, Urochloa mosambicensis, Setaria incrassata, Paspalum dilatatum*<br>Herbaceous plants / forbs: - |
| **Species richness (indigenous species) at the time of the site visit** |
| Total indigenous species recorded in walked transects: **31**<br>Grasses: 4, Forbs:1 Trees: 9 |
| **Protected or threatened plant species** |
| None observed in walked transects and likelihood within the site of occurring is low. |
| **Alien and/or invasive plant species** |
| Category 1b invasive species recorded:<br>• *Melia azedarach*<br>• *Morus alba*<br>• *Crotalaria agatifolia* |
| **Sensitive ecological features** |
| The vegetation was in a secondary and degraded state with continuous edge effects and disturbances.<br>• Within a CBA2<br>• No habitat to SCC as listed in Appendix C<br>• Watercourse |

## 4.3 Plant Species of Conservation Concern (national classification and protection)

Plants of conservation concern are those plants that are important for South Africa's conservation decision making processes and include all plants that are Threatened, Extinct in the wild, Data deficient, Near-threatened, Critically rare and Rare (Figure 14). Chapter 4, Part 2 of National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004) (NEMBA) provides for listing of species that are threatened or in need of protection to ensure their survival in the wild, while regulating the activities, including trade, which may involve such listed threatened or protected species and activities which may have a potential impact on their long-term survival.

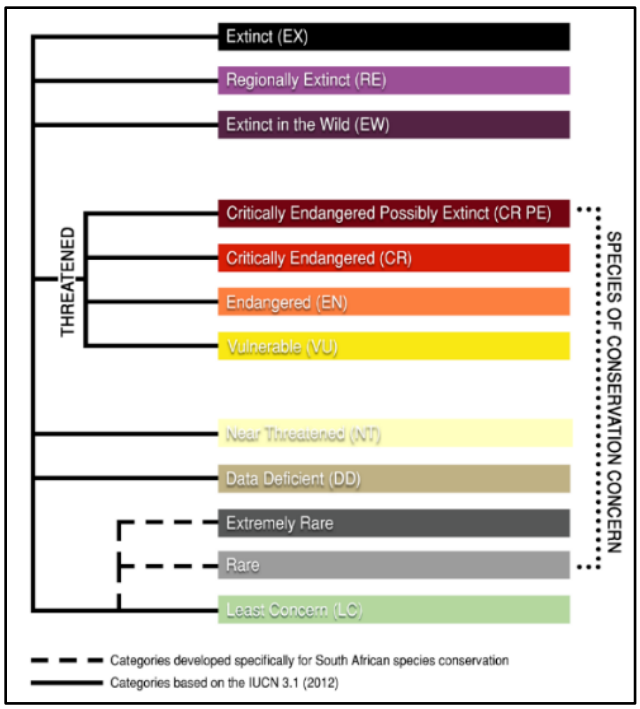


**Figure 14: Categories of SCC modified from the IUCN's extinction risk categories (reproduced in part from IUCN, 2012).**

A list of plants of conservation concern was compiled using information from the SANBI checklist (SANBI, 2009), Raimondo *et al*, (2009), and information gathered from the Plants of Southern Africa website (POSA) for the area the site is situated in, and information received from the SANBI on sensitive species of conservation concern listed in the screening tool report for the project area, dated 28/03/2025.

The national screening tool report for this site, downloaded on 28/03/2025 at 15:04:45, states that the site is of medium plant species sensitivity, and at least two (2) plant species of conservation concern are likely to occur. However, other data sources were also consulted and a list of eight (8) SCC which was historically recorded in the larger area that the site is situated in were shortlisted for review. These species are listed in Appendix C: Plant Species Compliance Statement.

The site inspection was carried out concurrently to this vegetation assessment and none of the species listed in Appendix C was recorded and none are expected to be present (see Appendix C for plant species compliance statement).

The assessment disagrees with the national screening tool report of medium plant species sensitivity for the site. Due to the secondary nature of the grassland, no plant species of conservation concern were recorded or are expected to be present in either the secondary grasslands or moist grassland. One (1) species is likely to occur along the Jukskei River. Due to prescribed buffers around watercourses, this species habitat is undevelopable and no edge effects from activities on the site should be allowed to impact on the watercourse and buffer area. If no

development is planned in or close to the Jukskei River, no further plant species assessment is deemed necessary

## 4.4 Protected plants

### 4.4.1 NEMBA Threatened or Protected Plant Species (TOPS)

Chapter 4, Part 2 of the National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004) (NEMBA) provides for listing of plant and animal species as threatened or protected. If a species is listed as threatened, it must be further classified as Critically Endangered, Endangered or Vulnerable. These species are commonly referred to as TOPS listed. The Act defines these classes as follows:

- Critically endangered species: any indigenous species facing an extremely high risk of extinction in the wild in the immediate future.
- Endangered species: any indigenous species facing a high risk of extinction in the wild in the near future, although it is not a critically endangered species.
- Vulnerable species: any indigenous species facing an extremely high risk of extinction in the wild in the medium-term future; although it is not a critically endangered species or an endangered species.
- Protected species: any species which is of such high conservation value or national importance that it requires national protection. Species listed in this category will include, among others, species listed in terms of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).

Certain activities, known as ‘Restricted Activities’, are regulated on listed species using permits by a special set of regulations published under the Act. Restricted activities regulated under the act are keeping, moving, having in possession, importing and exporting, and selling. The first list of threatened and protected species published under NEMBA was published in the government gazette on the 23rd of February 2007 along with the Regulations on Threatened or Protected Species.

No TOP species were recorded or are expected to be present.

### 4.4.2 Provincially Protected Plants

A number of provincially protected plants are listed in the Transvaal Nature Conservation Ordinance Act No. 12 of 1983. These plants are not to be removed, damaged, or destroyed without permit authorisation from Gauteng Department of Agriculture and Rural Development (GDARD). No provincially protected plant species were recorded in walked transects at the time of this assessment.

## 4.5 Alien Invasive Plant Species

Declared weeds and invader plant species have the tendency to dominate or replace the canopy or herbaceous layer of natural ecosystems, thereby transforming the structure, composition, and function of natural ecosystems. Therefore, it is important that these plants are controlled and eradicated by means of an eradication and monitoring programme. Some invader plants may also degrade ecosystems through superior competitive capabilities to exclude native plant species (Henderson, 2001).

The NEMBA is the most recent legislation pertaining to alien invasive plant species. In September 2020, an updated list of Alien Invasive Species was published in terms of the Act (Government Gazette No 78 of 2014). The Alien and Invasive Species Regulations were published in the Government Gazette No. 43726, 18 September 2020. The legislation calls for the removal and/ or control of alien invasive plant species (Category 1 species). In addition, unless authorised thereto in terms of the National Water Act, 1998 (Act No. 36 of 1998), no land user shall allow Category 2 plants to occur within 30 meters of the 1:50 year flood line of a river, stream, spring, natural channel in which water flows regularly or intermittently, lake, dam or wetland. Category 3 plants are also prohibited from occurring within proximity to a watercourse.

Below is a brief explanation of the three categories in terms of the NEMBA:

Category 1a: Invasive species requiring compulsory control. Remove and destroy. Any specimens of Category 1a listed species need, by law, to be eradicated from the environment. No permits will be issued.

Category 1b: Invasive species requiring compulsory control as part of an invasive species control programme. Remove and destroy. These plants are deemed to have such a high invasive potential that infestations can qualify to be placed under a government sponsored invasive species management programme. No permits will be issued.

Category 2: Invasive species regulated by area. A demarcation permit is required to import, possess, grow, breed, move, sell, buy or accept as a gift any plants listed as Category 2 plants. No permits will be issued for Category 2 plants to exist in riparian zones.

Category 3: Invasive species regulated by activity. An individual plant permit is required to undertake any of the following restricted activities (import, possess, grow, breed, move, sell, buy or accept as a gift) involving a Category 3 species. No permits will be issued for Category 3 plants to exist in riparian zones.

The alien plant species identified on the study site are listed in Appendix B. Twelve (12) category 1b plants were observed within the project area as listed below.

**Table 9: Category 1b invasive plant species and the vegetation group(s) it was recorded in**

| Species | Common name | Vegetation groups |
|---|---|---|
| *Arundo donax* | Giant Reed | Moist grassland, northern boundary |
| *Campuloclinium macrocephalum* | Pom-Pom Weed | Secondary grassland |
| *Cestrum laevigatum* | Inkberry | Riparian vegetation |
| *Cirsium vulgare* | Scotch Thistle | Secondary grassland |
| *Crotalaria agatiflora* | Bird Flower | Riparian vegetation |
| *Eucalyptus camaldulensis* | Red River Gum | *Eucalytpu*s dominated secondary grassland |
| *Ipomoea purpurea* | Morning Glory | Moist grassland, northern boundary |
| *Melia azedarach* | Syringa | Moist grassland, northern boundary, Riparian vegetation |
| *Mirabilis jalapa* | Four-o'clocks | *Eucalytpu*s dominated secondary grassland |
| *Salvia tiliifolia* | Lindenleaf sage | *Eucalytpu*s dominated secondary grassland |
| *Tamarix ramosissima* | pink tamarisk | Moist grassland, northern boundary |
| *Verbena brasiliensis* | | Moist grassland |

# 5 SITE ECOLOGICAL IMPORTANCE

It has been clearly demonstrated that vegetation not only forms the basis of the trophic pyramid in an ecosystem but also plays a crucial role in providing the physical habitat within which organisms complete their life cycles (Kent & Coker 1992). Therefore, the vegetation of an area will largely determine the ecological sensitivity thereof. SEI score for each vegetation group is listed in Table 10 and geographically represented in Figure 15.

## 5.1 Rating and Analysis

As plant SCC were recorded, as well as suitable habitat for other species within the project area, a SEI in terms of vegetation is discussed and mapped as per the requirements of the Species Environmental Assessment Guideline (SANBI, 2020) and detailed in the methodology section (Section 2.5).

**SEI** is a function of the (BI) of the receptor (e.g., SCC, the vegetation/fauna community or habitat type present on the site and its resilience to impacts as follows:

**SEI =** Biodiversity Importance (**BI) +** Receptor Resilience **(RR)**

Wherein **BI** in turn is:
**BI =** Conservation Importance (**CI) +** Functional Integrity (**FI)**

**Table 10: Scoring of vegetation that occurs within the site**

| Broad vegetation group | Conservation Importance (CI) | Functional Integrity (FI) | Biodiversity Importance (BI) | Receptor Resilience (RR) | Site Ecological Importance (SEI) – mitigation |
|---|---|---|---|---|---|
| **Transformed** | **Very low**<br>No natural habitat remaining. | **Very low**<br>Several major current ecological impacts. | **Very low** | **Very high**<br>Habitat can recover rapidly | **Very Low (Minimise)** |
| **Secondary grassland** | **Low**<br>No confirmed or highly likely SCC.<br>No confirmed or highly likely range-restricted species.<br>Less than 50 % contains natural habitat with limited potential to support SCC. | **Medium**<br>Mostly minor current negative ecological impacts with some major impacts; moderate rehabilitation potential | **Low** | **Medium-high**<br>Habitat can recover quickly | **Low (Minimise & Restore)** |
| ***Eucalyptus* dominated secondary grassland** | **Low**<br>No confirmed or highly likely SCC.<br>No confirmed or highly likely range-restricted species.<br>Less than 50 % contains natural habitat with limited potential to support SCC. | **Medium**<br>Mostly minor current negative ecological impacts with some major impacts; moderate rehabilitation potential | **Low** | **Medium-high**<br>Habitat can recover quickly | **Low (Minimise & Restore)** |
| **Moist grassland** | **Medium-high**<br>High<br>Likely situated within a watercourse (wetland) as defined by the | **Medium**<br>Mostly minor current negative ecological impacts with some major | **Medium** | **Medium**<br>Recovers slowly (>10 years for >70 % of the original species | **Medium (minimise & restore)** |

| Broad vegetation group | Conservation Importance (CI) | Functional Integrity (FI) | Biodiversity Importance (BI) | Receptor Resilience (RR) | Site Ecological Importance (SEI) – mitigation |
|---|---|---|---|---|---|
| | National Water Act No 36 of 1998 (NWA)*<br>Medium<br>About 50 % contains natural habitat with limited potential to support SCC. | impacts, moderate rehabilitation potential | | composition and functionality | |
| **Riparian vegetation** | **High**<br>Situated in a watercourse as defined by the National Water Act No 36 of 1998 (NWA)* | **Medium -high**<br>High<br>Good habitat connectivity with potentially functional ecological corridors<br>Medium<br>Mostly minor current negative ecological impacts with some major impacts | **Medium** | **Low**<br>Unlikely to recover fully (<50% restored) after >15 years.<br>Possibility of erosion and destabilisation | **High (Avoid & Minimise))** |

The interpretation of the SEI ranks is described in Section 2: Methodologies. The SEI rating was utilised to generate the vegetation sensitivity map (Figure 15). This map must be considered along with the fauna sensitivity map and wetland delineation map to obtain an overall sensitivity map.

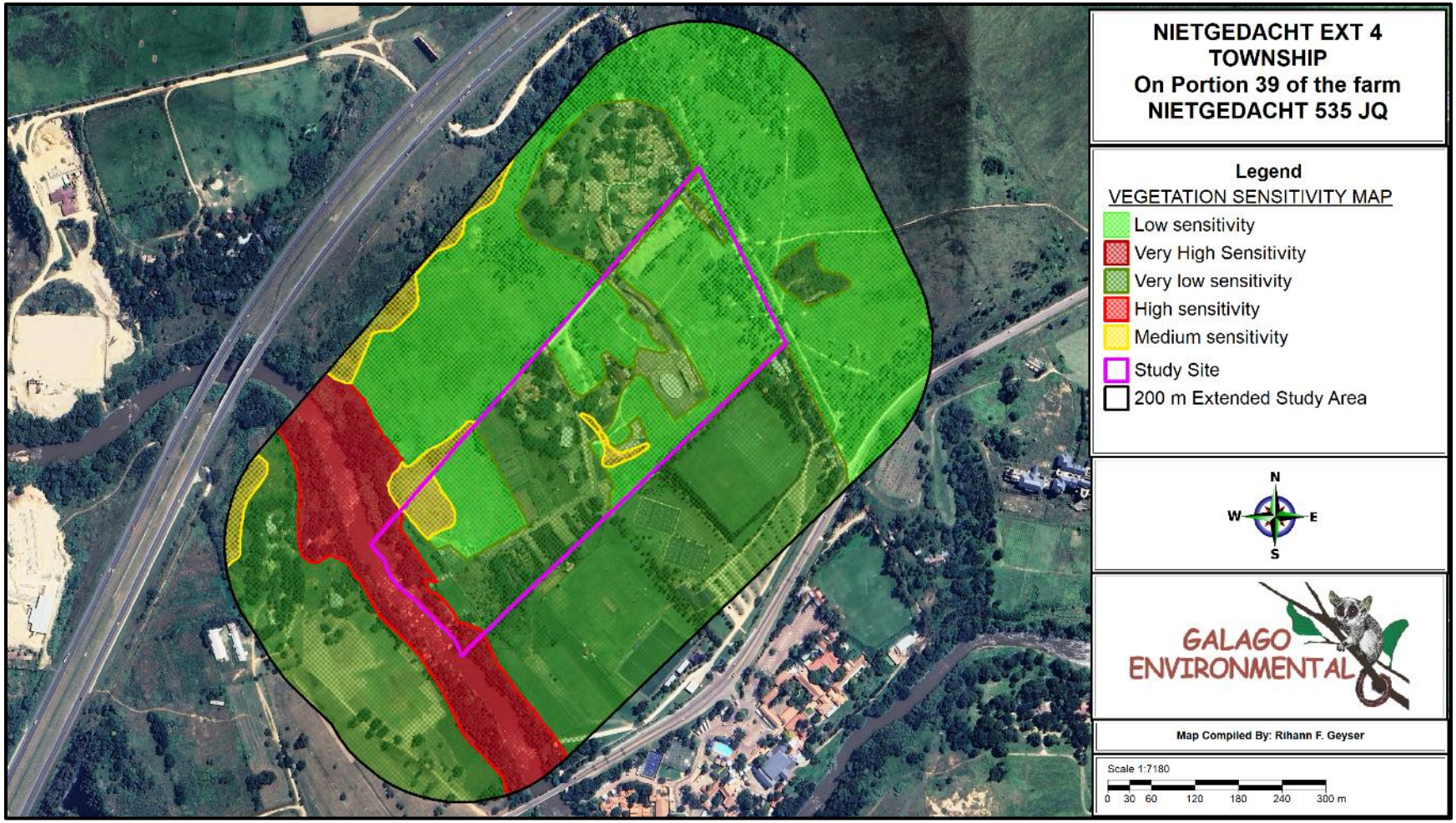


**Figure 15: Site Ecological Sensitivity for the project area**

# 6 SUMMARY OF VEGETATION ASSESSMENT- VS SCREENING TOOL RESULTS

## 6.1 Biodiversity (vegetation) results

The screening tool rates most of the site as being of high terrestrial biodiversity sensitivity, triggered by the Ecological Support Areas (ESAs), Critical Biodiversity Areas as well as the Critically Endangered Egoli Granite grassland that occurs in the area that the site is situated in. However, this assessment found that the vegetation on the site comprises mainly of secondary grassland that is not representative of Egoli Granite Grassland and does not contribute to the conservation of this Critically Endangered ecosystem. This finding corresponds to the findings of the National Biodiversity Assessment wherein the site is not located in remnant patches of Egoli Granite Grassland (SANBI, 2019). The secondary grassland is severely modified, classified by this report as low sensitivity and no plant species of conservation concern were recorded or are expected to persist. Most types of development can proceed within these areas with little to no impact on conservation worthy vegetation, if edge effects to other proximate sensitivity classes are mitigated / prevented.

The CBA along the Jukskei River must be avoided. For the continuation of ecosystem services, the secondary grasslands within the ESA1 and ESA 2 should remain connected where possible and maintained as a corridor to the Jukskei River.

The site includes moist grassland. Note that the moist grasslands are an indication of where wetlands could occur. The moist grasslands, due to historic disturbances and the secondary nature of the vegetation, was classified as medium sensitivity by this report. However, the wetland assessment for the project must be consulted for the delineated boundaries, buffers and sensitivity of the wetlands on the site.

The riparian vegetation along the Jukskei River plays an important role in soil stabilisation, water purification and flood attenuation. Furthermore, is forms part of the watercourse which is protected by the National Water Act (1998) and classified as high sensitivity in this report.

## 6.2 Plant species results

No plant species of conservation concern were recorded. Although the screening tool report classifies the site as being of medium plant species sensitivity (Figure 3), no suitable habitat for such species persists on the site and this report found that that the likelihood of such species occurring on most of the site is low. However, any development impeding onto the watercourse buffers may impact on the remaining suitable habitat for such species on the site. A plant species compliance statement is appended to this report (Appendix C).

# 7 IMPACT ASSESSMENT AND MITIGATION

Mankind depends on the natural environment for many ecological services provided for by ecosystems, ecological processes, and plant species in general. However, any development activities in natural systems will impact on the surrounding natural environment and usually in a negative way. To limit or negate these impacts, the source, extent, duration, and intensity of the possible impacts needs to be identified. Once the significance of the impacts is understood, the development could both adequately plan for and mitigate these impacts to a best practise and acceptable level. However, if the impacts are significant, especially in already threatened ecosystems and vegetation units, and no adequate mitigation measures could reduce or avert these impacts, then the development should not be allowed to proceed.

Biodiversity impacts from large-scale solar projects remain poorly understood. Often, only limited data are available on the extent and severity of potential impacts to sensitive species (Barron-Gafford, *et al* 2016).

## 7.1 Impact statement and recommendation

### 7.1.1 Impact on CBA1 / ESAs

According to the Gauteng Conservation Plan, 6.5 ha of the site is within an ESA 2 and 1 ha in an ESA1. A further 3.8ha falls within a CBA1. Other than the riparian vegetation within the CBA, no natural vegetation remains in the ESAs.

As each planning unit is uniform in size (4ha) and may contain multiple land cover types, it is important to note that the CBA classification generally only applies to the natural, secondary or cropland portion of a planning unit and not necessarily the whole planning unit (Desmet, *et al* 2024).

### 7.1.2 Impact on ecosystem threat status

On a national level the site is situated within the Egoli Granite Grassland which is a Critically Endangered ecosystem. However, this assessment found that the vegetation on the site comprises mainly of secondary grassland that is not representative of Egoli Granite Grassland and does not contribute to the conservation of this Critically Endangered ecosystem. This finding corresponds to the findings of the National Biodiversity Assessment wherein the site is not located in remnant patches of Egoli Granite Grassland (SANBI, 2019). The secondary grassland is severely modified, classified by this report as low sensitivity and no plant species of conservation concern were recorded or are expected to persist. Most types of development can proceed within these areas with little to no impact on conservation worthy vegetation, if edge effects to other proximate sensitivity classes are mitigated / prevented.

### 7.1.3 Impact on SCCs

No impact is expected on sensitive plant species or plant species of conservation concern.

## 7.2 Impact Ranking Criteria

The possible impacts, as described in the next section, were assessed based on the Significance Rating. The Significance of the impact is calculated as follows and rating significance is explained below:

**Significance = Consequence** *(Extent + Duration+ Magnitude)* **X Probability**

I. The **nature**, which shall include a description of what causes the effect, what will be affected and how it will be affected.

II. The **extent**, wherein it will be indicated whether the impact will be local (limited to the immediate area or site of development) or regional, and a value between 1 and 5 will be assigned as appropriate (with 1 being low and 5 being high)

III. The **duration**, wherein it will be indicated whether
- the lifetime of the impact will be of a very short duration (0–1 years) – assigned a score of 1;
- the lifetime of the impact will be of a short duration (2-5 years) - assigned a score of 2;
- medium-term (5–15 years) – assigned a score of 3;
- long term (> 15 years) - assigned a score of 4; or
- permanent - assigned a score of 5;

IV. The **consequences (magnitude)**, quantified on a scale from 0-10, where
- 0 is small and will have no effect on the environment,
- 2 is minor and will not result in an impact on processes,
- 4 is low and will cause a slight impact on processes,
- 6 is moderate and will result in processes continuing but in a modified way,
- 8 is high (processes are altered to the extent that they temporarily cease), and
- 10 is very high and results in complete destruction of patterns and permanent cessation of processes.

V. The **probability** of occurrence, which shall describe the likelihood of the impact actually occurring. Probability will be estimated on a scale of 1–5, where
- 1 is very improbable (probably will not happen),
- 2 is improbable (some possibility, but low likelihood),
- 3 is probable (distinct possibility),
- 4 is highly probable (most likely) and
- 5 is definite (impact will occur regardless of any prevention measures).

VI. The significance, which shall be determined through a synthesis of the characteristics described above and can be assessed as low, medium or high

VII. The **status**, which will be described as either positive, negative or neutral.

VIII. The degree to which the impact can be reversed.

IX. The degree to which the impact may cause irreplaceable loss of resources.

X. The degree to which the impact can be mitigated.

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

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

### 7.3 Impact Assessments and Mitigation

The tables below list the activities that could impact on the vegetation due to the proposed development The tables also list recommended mitigation measures to limit the impacts.

#### 7.3.1 Destruction of secondary vegetation

***Nature:*** The development will require the removal of the vegetation, albeit secondary, within the footprint of the development. Illegal disposal of construction material such as oil, cement etc. could destroy natural vegetation***.***

The sources of this impact include:

- Clearing of and damage to vegetation in construction footprint, access roads, construction camps, vehicle / machinery traffic and trampling by workers (stepping on small plants);
- Illegal disposal and dumping of construction material such as cement or oil, as well as maintenance materials during construction;
- Edge effects e.g. heavy vehicles turning in adjacent areas;
- Storage of equipment within vegetation; and
- Operational vehicles or vehicles visiting the site, driving within natural or rehabilitated vegetation, not impacted on during the construction, will lead to the destruction of naturally occurring vegetation and compaction of soils and subsequent erosion or colonisation by alien invasive plant species. In addition, failed rehabilitation could lead to soil erosion during rainfall events and flooding.

| | **Without mitigation** | **With mitigation** |
|---|---|---|
| **CONSTRUCTION PHASE** | | |
| ***Probability*** | Definite (5) | Definite (5) |
| ***Duration*** | Permanent (5) | Permanent (5) |
| ***Extent*** | Limited to Local Area (2) | Limited to site (1) |
| ***Magnitude*** | Moderate (6) | Low (4) |

| | | |
|---|---|---|
| ***Significance*** | **65 (high)** | **50 (medium)** |
| ***Status (positive or negative)*** | Negative | Negative |
| **OPERATIONAL PHASE (e.g., edge effects)** | | |
| ***Probability*** | Probable (3) | Improbable (2) |
| ***Duration*** | Medium term (3) | Short term (2) |
| ***Extent*** | Limited to Local Area (2) | Limited to the Site (1) |
| ***Magnitude*** | Moderate (6) | Low (4) |
| ***Significance*** | **33 (medium)** | **14 (low)** |
| ***Status (positive or negative)*** | Negative | Negative |
| ***Reversibility*** | Low | Moderate |
| ***Irreplaceable loss of resources?*** | Low | Low |
| ***Can impacts be mitigated?*** | Yes | |

***Mitigation:***

*Planning:*

- The layout plant must not infringe on the riparian vegetation or wetlands as delineated by the wetland specialist.
- The site footprint must remain as small as possible and conserve as much grassland, albeit secondary, as possible.
- Construction camps must be planned within the area to be developed or elsewhere, but not in the natural vegetation (e.g. watercourse vegetation) on or adjacent to the site. This will limit degradation of the vegetation and the subsequent invasion by alien invasive plant species.
- Use indigenous plants local to the area in the landscaping of the development.
- Plan to rehabilitate wetland areas on the site where possible.

*Construction:*

An independent Ecological Control Officer (ECO) should be appointed to oversee construction.

- Removal of vegetation must be restricted to the proposed development footprint. Keep the development footprint as small as possible.
- Keep the work area (e.g. area to be disturbed) to a minimum.
- A temporary fence or demarcation must be erected around the construction area (include the actual footprint) to prevent access to adjacent vegetation.
- Prohibit vehicular or pedestrian access into natural areas beyond the demarcated boundary of the construction area.
- No open fires are permitted within naturally vegetated areas.
- Construction workers may not remove flora, and neither may anyone collect seed from the plants without permission from the local authority.
- Maintain site demarcations in position until the cessation of construction work.
- After construction, the land must be cleared of rubbish, surplus materials, and equipment.

*Operational:*

- Cordon off areas that are under rehabilitation as no-go areas using danger tape and steel droppers. If necessary, these areas should be fenced off to prevent vehicular, pedestrian and livestock access.
- Any disturbances to the adjacent vegetation must be rehabilitated in accordance with the rehabilitation plan. This includes prevention of infestation by alien and invasive plant species.

- Maintenance /operational workers may not trample natural vegetation, and work should be restricted to previously disturbed footprint. In addition, mitigation measures as set out for the construction phase should be adhered to.

***Cumulative impacts:***

Possible future expansion of the church facilities. However, as along as wetland and riparian buffers are respected, and secondary grassland / mowed lawns remain as ground water resource zones, the impact is considered limited.

***Residual Risks:***

- Localised alteration of soil surface characteristics and loss of flora.
- Increased fragmentation of remaining vegetation.
- Possible erosion and invasion by alien invasive plant species and densification of bush encroacher species in the watercourse vegetation.

### 7.3.2 Exposure to erosion and subsequent sedimentation or pollution of proximate watercourses

***Nature:*** The removal of surface vegetation will expose the soils, which in rainy events would wash down into the watercourse vegetation on and downstream of the site, causing sedimentation. In addition, indigenous vegetation communities are unlikely to colonise eroded soils successfully, particularly due to the high occurrence of invasive plant species in the study area. Seeds from proximate alien invasive plant species can spread easily into these eroded soils. After construction, a lack of rehabilitation or failed rehabilitation will result in bare soils that are susceptible to erosion. The sources of this impact include:

- Removal of vegetation in proximity to the watercourse, without proper rehabilitation or failure of rehabilitation;
- Work on slopes, channels rainfall and causes erosion;
- Lack of rehabilitation or failed rehabilitation;
- Spillages of construction material and harmful chemicals; and

| | **Without mitigation** | **With mitigation** |
|---|---|---|
| **CONSTRUCTION PHASE** | | |
| ***Probability*** | Highly Probable (4) | Probable (3) |
| ***Duration*** | Medium-term (3) | Short-term (2) |
| ***Extent*** | Limited to Local Area (2) | Limited to site (1) |
| ***Magnitude*** | High (8) | Low (4) |
| ***Significance*** | **52 (medium)** | **21 (low)** |
| ***Status (positive or negative)*** | Negative | Negative |
| **OPERATIONAL PHASE** | | |
| ***Probability*** | Probable (3) | Improbable (2) |
| ***Duration*** | Medium term (3) | Short term (2) |
| ***Extent*** | Limited to Local Area (2) | Limited to the Site (1) |
| ***Magnitude*** | Moderate (6) | Low (4) |
| ***Significance*** | **33 (medium)** | **14 (low)** |
| ***Status (positive or negative)*** | Negative | Negative |
| ***Reversibility*** | Low | Moderate |
| ***Irreplaceable loss of resources?*** | Moderate | Low |

| | |
|---|---|
| ***Can impacts be mitigated?*** | Yes |

***Mitigation:***

*Planning:*

- Avoid direct impacts into the watercourse vegetation and buffer area as recommended by the wetland specialist (wetlands and riparian areas).
- Plan to remove as little indigenous vegetation as possible, or remove vegetation in a phased approach ensuring that soil is not exposed for lengthy periods.
- Prevent soil from washing into the watercourse area.
- Compile a stormwater management plan that will safeguard the proximate watercourses from construction and operational impacts.
- Ensure that runoff from the ensuing compacted or sealed surfaces (e.g. roads and parking areas) is slowed down and dispersed sufficiently to prevent erosion of the watercourse.

*Construction:*

- Retain vegetation and soil in position for as long as possible, removing it immediately ahead of construction / earthworks in that area (DWAF, 2005).
- Runoff from roads must be managed to avoid erosion and pollution problems.
- Remove only the vegetation where essential for construction and do not allow any disturbance to the adjoining natural vegetation cover.
- Protect all areas susceptible to erosion and ensure that there is no undue soil erosion resultant from activities within and adjacent to the construction camp and work areas.
- Prevent spillage of construction material, oils or other chemicals, strictly prohibit other pollution. Ensure there is a method statement in place to remedy any accidental spillages immediately.
- After construction clear any temporarily impacted areas of all foreign materials, re-apply and/or loosen topsoil and landscape to surrounding level.

*Operational:*

- Do not disturbed soil or indigenous vegetation unnecessary during operational activities.
- Cordon off areas that are under rehabilitation as no-go areas using danger tape and steel droppers. If necessary, these areas should be fenced off to prevent vehicular, pedestrian and livestock access.
- Operational activities may not trample natural vegetation and work should be restricted to previously disturbed footprint. In addition, mitigation measures as set out for the construction phase should be adhered to.

***Cumulative impacts:*** Erosion of the development footprint upslope from the watercourses could increase sedimentation in already degraded watercourses of the area. However, this could be mitigated.

***Residual Risks:***

- No indigenous vegetation cover in disturbed areas (failed rehabilitation)
- Colonisation by alien invasive plant species.

### 7.3.4 Potential increase in alien and invasive vegetation

***Nature:*** The seed of alien invasive plant species that occur on and in the vicinity of the construction areas could spread into the disturbed and stockpiled soil. Also, the construction vehicles and equipment were likely used on various other sites and could introduce alien invasive plant seeds or indigenous plants not belonging to this vegetation unit to the construction site. In addition, if rehabilitation of the indigenous vegetation around the development are unsuccessful or is not enforced, exotic and invasive vegetation may further invade the area.

| | **Without mitigation** | **With mitigation** |
|---|---|---|
| **CONSTRUCTION PHASE** | | |
| ***Probability*** | Definite (5) | Probable (3) |
| ***Duration*** | Long-term (4) | Short-term (2) |
| ***Extent*** | Local Area (2) | Site bound (1) |
| ***Magnitude*** | High (8) | Low (4) |
| ***Significance*** | **70 (high)** | **21 (low)** |
| ***Status (positive or negative)*** | Negative | Negative |
| **OPERATIONAL PHASE** | | |
| ***Probability*** | Probable (3) | Improbable (2) |
| ***Duration*** | Long term (4) | Short term (2) |
| ***Extent*** | Limited to Local Area (2) | Limited to the Site (1) |
| ***Magnitude*** | Low (4) | Minor (2) |
| ***Significance*** | **30 (medium)** | **10 (low)** |
| ***Status (positive or negative)*** | Negative | Negative |
| ***Reversibility*** | Moderate | High |
| ***Irreplaceable loss of resources?*** | Moderate | Low |
| ***Can impacts be mitigated?*** | Yes | |

***Mitigation:***

*Construction:*

- Remove alien invasive species (especially category 1b species) from the development footprint and immediate surrounds prior to construction or soil disturbances. By removing these species, the spread of seeds will be prevented into disturbed soils which could thus have a positive impact on the surrounding natural vegetation.
- All alien seedlings and saplings must be removed as they become evident for the duration of construction.
- All construction vehicles and equipment, as well as construction material should be free of plant material. Therefore, all equipment and vehicles should be thoroughly cleaned prior to access to the construction areas. This should be verified by the ECO.
- If filling material is to be used, this should be sourced from areas free of invasive species.

*Operational:*

- No alien and invasive plant species as listed on 18 September 2020 in the list of Alien Invasive Species published in terms of the National Environmental Management: Biodiversity Act (Act 10 of 2004) (Government Gazette No 43726 of 2020) may be planted within the development.
- Only use indigenous species, naturally occurring in the area, for rehabilitation or landscaping.
- Remove alien invasive species from the disturbance footprint as soon as they become apparent.

| |
|---|
| ***Cumulative impacts:*** The natural vegetation around the proposed development currently has a low frequency of alien invasive plant species. Therefore, if mitigation measures to limit and prevent the spread of alien species are, the infestation potential on the site is minimal. |
| ***Residual Risks:***<br>• Reinfestation or introduction of additional weeds during construction. |

| |
|---|
| ***Cumulative impacts:*** Possible bush densification around the site and loss of indigenous species diversity – mainly due to a lack of fire. |
| ***Residual Risks:*** Bush encroachment |

## 7.4 Impact Management Outcomes for EMPr

The following outcomes must be attained by implementing the mitigation measures as a minimum:

7.4.1 Planning:

1 The development footprint is limited and clustered in order to leave open space or corridors through the site, with the riparian vegetation in the southwest.

2 Only the proposed footprint of the proposed activities is disturbed. Edge effects are limited and rehabilitated where needed.

3 Areas disturbed by construction are re-vegetated with indigenous vegetation to prevent erosion, bush densification, dust, and colonisation by alien and invasive plant species.

4 Planning of the construction site must incorporate eventual rehabilitation / indigenous landscaping.

7.4.2 Management plans:

5 An alien invasive management plan ensures that regular monitoring takes place, and such species are removed as they become apparent. This plan also ensures that no alien invasive plant species are introduced to the site, and none is spreading into disturbed soils.

6 Stormwater management and Erosion control is in place.

7 Method statements for emergency events such as spills, fire, flooding etc.

7.4.3 Monitoring requirements

8 Monitor the state of alien invasive plant species in accordance with the alien invasive management plan. Monitoring must result in corrective action to remove the species as soon as it becomes evident.

9 Monitor and prevent edge effects and all activities that could impact on natural vegetation.

# 8 CONCLUSION AND SPECIALIST STATEMENT ON ISSUING AN ENVIRONMENTAL AUTHORISATION

The screening tool rates most of the site as being of high terrestrial biodiversity sensitivity, triggered by the Ecological Support Areas (ESAs), Critical Biodiversity Areas as well as the Critically Endangered Egoli Granite grassland that occurs in the area that the site is situated in. However, this assessment found that the vegetation on the site comprises mainly of secondary grassland that is not representative of Egoli Granite Grassland and does not contribute to the conservation of this Critically Endangered ecosystem.

This finding corresponds to the findings of the National Biodiversity Assessment wherein the site is not located in remnant patches of Egoli Granite Grassland (SANBI, 2019). The secondary grassland as the vegetation is severely modified, classified by this report as low sensitivity and no plant species of conservation concern were recorded or are expected to persist. Most types of development can proceed within these areas with little to no impact on conservation worthy vegetation, if edge effects to other proximate sensitivity classes are mitigated / prevented.

The site includes moist grassland. Note that the moist grasslands is an indication of where wetlands could occur. The moist grasslands, due to historic disturbances and the secondary nature of the vegetation, was classified as medium sensitivity by this report. However, the wetland assessment for the project must be consulted for the delineated boundaries, buffers and sensitivity of the wetlands on the site.

The riparian vegetation along the Jukskei River plays an important role in soil stabilisation, water purification and flood attenuation. Furthermore, is forms part of the watercourse which is protected by the National Water Act (1998) and classified as high sensitivity in this report.

The CBA along the Jukskei River must be avoided. For the continuation of ecosystems services, the secondary grasslands within the ESA1 and ESA 2 should remain connected where possible and maintained as a corridor to the Jukskei River.

## 8.1 Plant species results

No plant species of conservation concern were recorded. Although the screening tool report classifies the site as being of medium plant species sensitivity (Figure 3), no suitable habitat for such species persists on the site and this report found that that the likelihood of such species occurring is low. However, any development impeding onto the watercourse buffers may impact on the remaining suitable habitat for such species on the site. A plant species compliance statement is appended to this report (Appendix C).

From a vegetation perspective there is no objection to the proposed development and formalization of existing structures provided that mitigation measures as set out in this report is adhered to as a minimum.

# 9 CONDITIONS TO BE CONSIDERED IF THE EA IS GRANTED

The mitigation measures identified for the impacts as listed in Section 7.3 must be incorporated into the EMPr and implemented during planning, construction, and operation. Specific mitigation measures and recommendations that should be incorporated into the EA (if granted) include:

- The design phase must follow recommendations and buffers as stipulated by the wetland specialist.
- The design must include an ecologically sound, storm water management plan.
- All necessary permitting and authorisations must be obtained prior to the commencement of any construction activities.
- A vegetation management plan for remaining natural and rehabilitated vegetation (watercourse vegetation).
- An alien invasive management plan to be implemented.
- An erosion management plan must be developed prior to the commencement of construction activities to mitigate the unnecessary loss of topsoil and runoff.

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| iNaturalist: | http://inaturalist.rog |

Site observations posted on iNaturalist at: Observations · iNaturalist

# 11 GLOSSARY

| | |
|---|---|
| **Alien species** | Plant taxa in a given area, whose presence there, is due to the intentional or accidental introduction as a result of human activity |
| **Azonal** | Water-logged and salt-laden habitats require specially adapted plants to survive in these habitats. Consequently the vegetation deviates from the typical surrounding zonal vegetation and are considered to be of azonal character (Mucina & Rutherford, 2006) |
| **Biodiversity** | Biodiversity is the variability among living organisms from all sources including inter alia terrestrial, marine and other aquatic ecosystems and ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems |
| **Biome** | A major biotic unit consisting of plant and animal communities having similarities in form and environmental conditions, but not including the abiotic portion of the environment. |
| **Buffer zone** | A collar of land that filters edge effects. |
| **Conservation** | The management of the biosphere so that it may yield the greatest sustainable benefit to present generation while maintaining its potential to meet the needs and aspirations of future generations. The wise use of natural resources to prevent loss of ecosystems function and integrity. |
| **Conservation concern (**Plants of...) | Plants of conservation concern are those plants that are important for South Africa's conservation decision making processes and include all plants that are Threatened (see **Threatened**), Extinct in the wild, Data deficient, **Near threatened**, Critically rare, Rare and **Declining**. These plants are nationally protected by the National Environmental Management: Biodiversity Act. Within the context of these reports, plants that are provincially protected are also discussed under this heading. |
| **Conservation status** | An indicator of the likelihood of that species remaining extant either in the present day or the near future. Many factors are taken into account when assessing the conservation status of a species: not simply the number remaining, but the overall increase or decrease in the population over time, breeding success rates, known threats, and so on |
| **Conservation Importance** | 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 & NT), Rare, range-restricted species, globally significant populations of congregatory species, and areas of threatened ecosystem types, through predominantly natural processes. |
| **Community** | Assemblage of populations living in a prescribed area or physical habitat, inhabiting some common environment. |
| **Critically Endangered** | A taxon is Critically Endangered when it is facing an extremely high risk of extinction in the wild in the immediate future. |
| **Data Deficient** | There is inadequate information to make a direct, or indirect, assessment of its risk of extinction based on its distribution and/or population status. However, "data deficient" is therefore not a category of threat. Listing of taxa in this category indicates that more information is required and acknowledges the |

| | |
|---|---|
| | possibility that future research will show that threatened classification is appropriate. |
| **Declining** | A taxon is declining when it does not meet any of the five IUCN criteria and does not qualify for the categories Threatened or Near Threatened, but there are threatening processes causing a continuous decline in the population (Raimondo *et al*, 2009). |
| **Ecological Corridors** | Corridors are roadways of natural habitat providing connectivity of various patches of native habitats along or through which faunal species may travel without any obstructions where other solutions are not feasible |
| **Ecosystem** | Organisms together with their abiotic environment, forming an interacting system, inhabiting an identifiable space |
| **Edge effect** | Inappropriate influences from surrounding activities, which physically degrade habitat, endanger resident biota and reduce the functional size of remnant fragments including, for example, the effects of invasive plant and animal species, physical damage and soil compaction caused through trampling and harvesting, abiotic habitat alterations and pollution |
| **Endangered** | A taxon is Endangered when it is not Critically Endangered but is facing a very high risk of extinction in the wild in the near future |
| **Endemic** | Naturally only found in a particular and usually restricted geographic area or region |
| **Exotic species** | Plant taxa in a given area, whose presence there, is due to the intentional or accidental introduction as a result of human activity |
| **Forb** | An herbaceous plant other than grasses. |
| **Habitat** | Type of environment in which plants and animals live |
| **Indigenous** | Any species of plant, shrub or tree that occurs naturally in South Africa |
| **Igneous rocks** | Rocks that formed from molten magma which are broadly classified according to their chemical composition using silica, potassium, sodium, calcium, iron, and magnesium as the key indicators. |
| **In Situ** | "In the place" In Situ conservation refers to on-site conservation of a plant species where it occurs. It is the process of protecting an endangered plant or animal species in its natural habitat. The plant(s) are not removed, but conserved as they are. Removal and relocation could kill the plant and therefore in situ conservation is preferred/ enforced. |
| **Invasive species** | Naturalised alien plants that can reproduce, often in large numbers. Aggressive invaders can spread and invade large areas |
| **Mafic rock & Ultramafic rock** | Igneous rocks: mafic rock contains between 45 and 55% silica and those containing less than 45% are ultramafic. |
| **Mitigation** | The implementation of practical measures to reduce adverse Impacts |
| **Near Threatened** | A Taxon is Near Threatened when available evidence indicates that that it nearly meets any of the five IUCN criteria for Vulnerable, and is therefore likely to qualify for a threatened category in the near future (Raimondo *et al*, 2009). |
| **Plant Community** | A collection of plant species within a designated geographical unit, which forms a relatively uniform patch, distinguishable from neighbouring patches of different vegetation types. The components of each plant community are influenced by soil type, topography, climate and human disturbance. In many |

| | |
|---|---|
| | cases there are several soil types within a given plant community (Gobbat *et al*, 2004) |
| **Protected Plant** | According to Provincial Nature Conservation Ordinances or Acts, no one is allowed to sell, buy, transport, or remove this plant without a permit from the responsible authority. These plants are protected by provincial legislation. |
| **Threatened** | Species that have naturally small populations, and species which have been reduced to small (often unsustainable) population by man's activities |
| **Red Data** | A list of species, fauna and flora that require environmental protection - based on the IUCN definitions. *Now termed Plants of Conservation Concern* |
| **Species diversity** | A measure of the number and relative abundance of species |
| **Species richness** | The number of species in an area or habitat |
| **Suffrutex** | Low-growing woody shrub or perennial with woody base, sometimes referred to as underground trees |
| **Threatened** | Threatened Species are those that are facing a high risk of extinction, indicated by placing in the categories Critically Endangered (CR), Endangered (E) and Vulnerable (VU) (Raimondo *et al,* 2009) |
| **Transformation** | The removal or radical disturbance of natural vegetation, for example by crop agriculture, plantation forestry, mining or urban development.<br>Transformation mostly results in a serious and permanent loss of biodiversity and fragmentation of ecosystems, which in turn lead to the failure of ecological processes. Remnants of biodiversity may survive in transformed landscapes |
| **Vegetation Association** | A complex of plant communities ecologically and historically (both in spatial and temporal terms) occupying habitat complexes at the landscape scale. Mucina and Rutherford (2006) state: "Our vegetation units are the obvious vegetation complexes that share some general ecological properties such as position on major ecological gradients and nutrient levels and appear similar in vegetation structure and especially floristic composition". |
| **Vulnerable** | A taxon is Vulnerable when it is not Critically Endangered or Endangered but meets any of the five IUCN criteria for Vulnerable and are therefore facing a high risk of extinction in the wild in the future (Raimondo *et al*, 2009) |

## APPENDIX A: SAMPLE POINT AND TRACK MAP

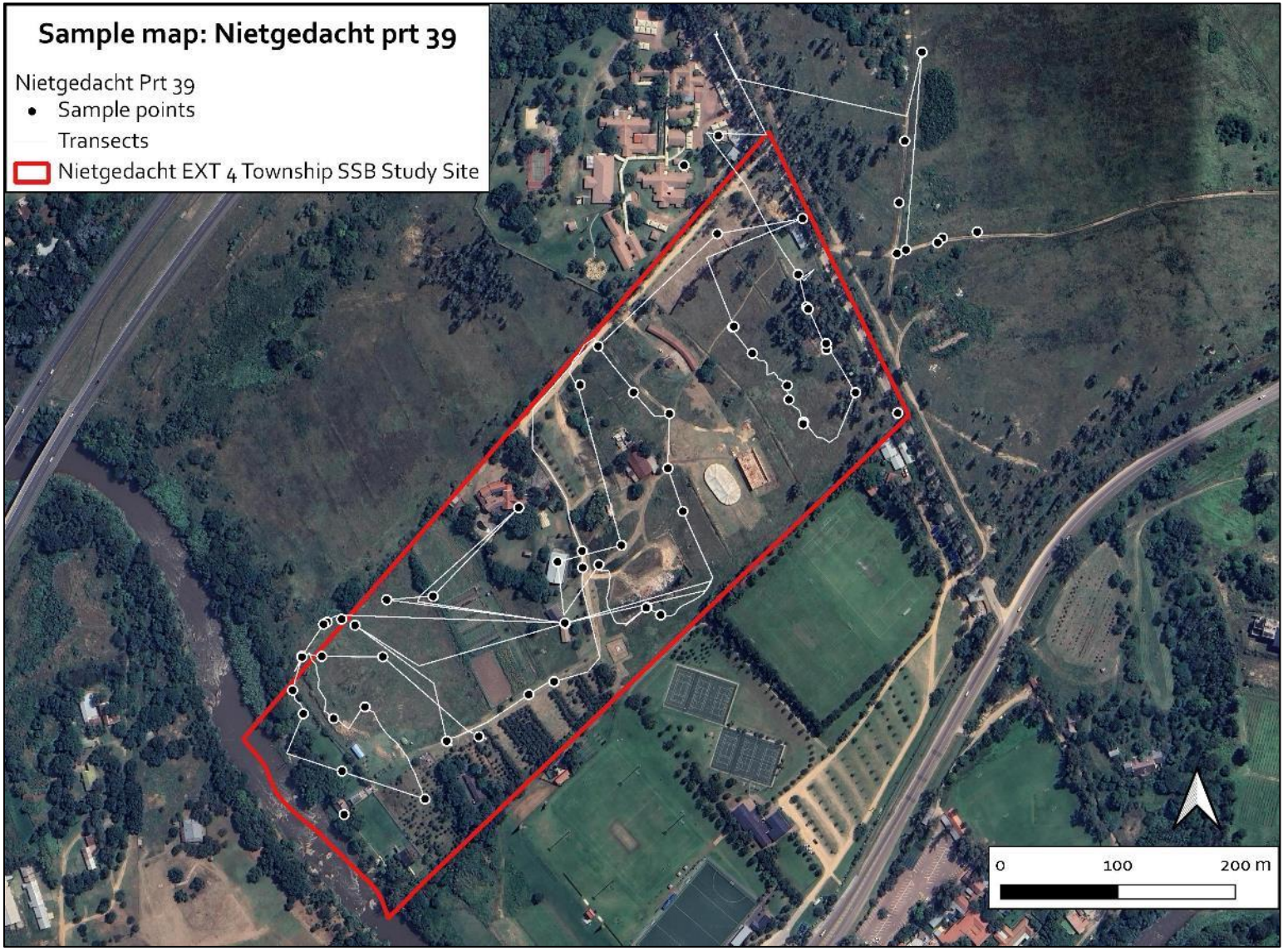


**Figure 16: Sample points and tracks**

# APPENDIX B: SPECIES RECORDED DURING THE FIELD SURVEY

1 = species recorded in broad vegetation group
M = Medicinal

| Species | Common name | Habitat notes | Secondary grassland | Eucalyptus secondary grassland | Moist grassland | Riparian |
|---|---|---|---|---|---|---|
| **Trees** | | | | | | |
| *Acacia (Vachellia) karroo (M)* | Sweet Thorn | Widespread, often proliferate in overgrazed areas | | | | 1 |
| *Celtis africana* | Stinkwood | Wooded areas or bush clumps, usually on dolomite | | | | 1 |
| *Combretum erytrohyllum* | River Bushwillow | Grassland and bushveld, usually along rivers or streams | | | | 1 |
| *Ehretia rigida* | Puzzle Bush | Wooded grassland, bushveld | | | | 1 |
| *Gymnosporia buxifolia* | Common Spike Thorn | Widespread, often as pioneer in disturbed places | | | | 1 |
| *Leocosidea sericea* | Oldwood | In kloofs and along streams. Disturbed areas | | | | 1 |
| *Searsia lancea* | Sour Karee | Grassland and bushveld | | | | 1 |
| *Searsia pyroides* | Common Wild Currant | Mountain grassland, bushveld, grassland - wide range of habitats | | | | 1 |
| *Ziziphus mucronata* | Buffalo-thorn | Widespread, in various habitats | | | | 1 |
| **Number of indigenous tree species recorded (excl planted trees) =9** | | | **0** | **0** | **0** | **9** |
| **Grasses** | | | | | | |
| *Aristida congesta* | Tassel Three-awn | Disturbed, overgrazed or farmed land. Increaser II grass | 1 | 1 | | |

| Species | Common name | Habitat notes | Secondary grassland | Eucalyptus secondary grassland | Moist grassland | Riparian |
|---|---|---|---|---|---|---|
| *Cynodon dactylon* | Couch grass | Most soils, usually in disturbed areas. Increaser II grass, palatable | 1 | 1 | 1 | 1 |
| *Digitaria eriantha* | Finger Grass | Sandy, rocky soil in arid areas or next to rivers/vlei's in areas with higher rainfall. Planted for pasture | 1 | | 1 | |
| *Eragrostis chloromelas* | Curly leaf | Rocky slopes, mostly in open grassland. Increaser II grass | 1 | | | |
| *Eragrostis curvula* | Weeping Love Grass | Mostly occurs in disturbed areas / sown as pasture. Increaser II grass | 1 | 1 | 1 | |
| *Eragrostis lehmanniana* | Lehmann's Grass | Sandy soil, mostly in disturbed land. Increaser II grass | 1 | 1 | | |
| *Eragrostis plana* | Tough Love Grass | Disturbed areas, mostly in moist patches. Increaser II grass | 1 | 1 | 1 | |
| *Hyparrhenia hirta* | Common Thatching Grass | Well drained, rocky soil in open grassland and disturbed areas. Increaser I grass | 1 | 1 | 1 | |
| *Imperata cylindrica* | Cotton Wool Grass | Mostly in moist soils | | | 1 | |
| *Melinis repens* | Natal Red Top | Disturbed grassland. Increaser II grass. | 1 | | | |
| *Panicum maximum* | Guinea Grass | Grow in shade under trees, also in sun, moist to dry areas. | | 1 | | 1 |
| *Panicum natalense* | Natal Panicum (Suurbuffelsgras) | Open, mountainous grassland on well drained soil. Often grows on rocky slopes and where veld is frequently burnt. | 1 | | | |
| *Paspalum dilatatum* | Dallis Grass | Introduced grass, moist areas in vlei's and close to rivers. Sometimes planted for pasture | | | 1 | 1 |

| Species | Common name | Habitat notes | Secondary grassland | Eucalyptus secondary grassland | Moist grassland | Riparian |
|---|---|---|---|---|---|---|
| *Phragmites australis* | Common Reed | Grows close to water sources such as rivers and wetlands. | | | 1 | |
| *Setaria incrassata* | Vlei bristle grass | Moist areas and sometimes on rocky slopes | | | 1 | 1 |
| *Setaria pallida-fuscua* | Garden Bristle Grass | Disturbed areas, fallow lands, next to roads and where rainwater collect. Increaser II grass | | | 1 | |
| *Sporobulus africanus* | Ratstail Dropseed | Disturbed places close to water or in road verges. Compacted, damp soils. Increaser III grass | | | 1 | |
| *Sporobulus pyramidalis* | Catstail Dropseed | Disturbed areas where rainfall is high, or in moist places. Increaser II grass | | | 1 | |
| *Themeda triandra* | red grass | Undisturbed or disturbed open grassland. Decreaser Grass | 1 | | | |
| *Urochloa mosambicensis* | Bushveld Signal Grass | Disturbed areas such as farmland, also in compacted soils. Good grazing grass. Increaser II | | 1 | | |
| **Minimum number of indigenous grass species = 20** | | | **11** | **8** | **12** | **4** |
| **Small shrubs / Forbs / succulents** | | | | | | |
| *Cucumis hirsutus* | Wild Cucumber | Woodland or grassland | 1 | | | |
| *Eriosema psoraleoides* | Shrubby Yellow Eriosema | Grassland and open bushveld - usually in disturbed areas | 1 | | | |
| *Gomphocarpus fructicosus* | Milkweed | Disturbed areas | 1 | 1 | | |
| *Helichrysum cephaloideum* | | Grassland, oten disturbed areas | | 1 | | |
| *Helichrysum nudifolium (M)* | Hottentot's tea | Grassland | 1 | 1 | 1 | |

| Species | Common name | Habitat notes | Secondary grassland | Eucalyptus secondary grassland | Moist grassland | Riparian |
|---|---|---|---|---|---|---|
| *Helichrysum rugulosum (M)* | | Grassland, often in vlei's or patches in disturbed areas | 1 | 1 | 1 | |
| *Lactuca inermis* | Wild lettuce | Grassland and disturbed areas. | | 1 | | |
| *Oldenlandia herbacea* | | Grassland, usually on rocky ridges | 1 | 1 | | |
| *Salvia runcinata* | Wildesalie | Grassland, under trees, often in disturbed areas or even vlei's | | | | 1 |
| *Selago densiflora* | | Grassland and bushveld. | 1 | 1 | | |
| *Senecio inaequidens* | Canary weed | Grassland, often in overgrazed and disturbed places. | 1 | 1 | | |
| *Solanum panduriforme* | Poison Apple | Disturbed places, often under trees (probably an indigenous specie) | 1 | 1 | | |
| *Sonchus wilmsii* | Milk Thisle | Disturbed grasslands, often along roadsides | 1 | | 1 | |
| **Minimum number of indigenous forb species recorded = 13** | | | **10** | **9** | **3** | **1** |
| **Sedges** | | | | | | |
| *Cyperus congestus* | | Depressions in grassland, damp and temporary wet areas, ditches | | | **1** | |
| *Cyperus esculentus* | | Weedy exotic in marshy or ploughed areas | | | **1** | |
| *Fimbristylis dichotoma* | | Along the edge of rivers, floodplains, boggy peatland areas, wet, marshy grasslands, seepage areas and along damp roadside areas | | | **1** | |
| *Scirpoides burkei* | | Seasonal wetlands | | | **1** | |
| *Typha capensis** | Bulrush | Grows in marshy areas and along watercourses. | | | **1** | |
| **Number of sedge species recorded= 5** | | | **0** | **0** | **5** | **0** |
| **Alien / Invasive Species** | | | | | | |
| *Arundo donax* | Giant Reed | Category 1b | | | 1 | |

| Species | Common name | Habitat notes | Secondary grassland | Eucalyptus secondary grassland | Moist grassland | Riparian |
|---|---|---|---|---|---|---|
| *Campuloclinium macrocephalum* | Pom-Pom Weed | Invasive weed, Category 1b | 1 | | | |
| *Cestrum laevigatum* | Inkberry | Category 1b | | | | 1 |
| *Cirsium vulgare* | Scotch Thistle | Category 1b (NEMBA) Biennial | 1 | | | |
| *Erigeron (Conyza) albida* | Tall Fleabane | Weed | 1 | | | |
| *Crotalaria agatiflora* | Bird Flower | Category 1b (NEMBA) | | | | 1 |
| *Eucalyptus camaldulensis* | Red River Gum | Category 1b in riparian areas. Ons site these species occur within the watercourse | | 1 | | |
| *Ipomoea purpurea* | Morning Glory | Invader, Category 1b | | | 1 | |
| *Melia azedarach* | Syringa | Category 1b (3 in urban areas) | | | 1 | |
| *Mirabilis jalapa* | Four-o'clocks | Category 1b invader | | 1 | | 1 |
| *Morus alba* | Mulberry | Category 3 | | | 1 | 1 |
| *Oenothera tetraptera* | White evening Primrose | Weedy species | 1 | | | |
| *Salvia tiliifolia* | Lindenleaf sage | Category 1b | | 1 | | |
| *Tamarix ramosissima* | pink tamarisk | Category 1b | | | 1 | |
| *Verbena brasiliensis* | | Common weed of disturbed and moist places, declared category 1b invader | | 1 | 1 | |
| *Verbena tenuisecta* | Fine-leaved Verbena | Common in disturbed places | 1 | | | |
| *Zinnia peruviana* | Wildejakobrego p | Naturalised Weed | | 1 | | |
| **Number of alien and invasive species recorded= 17** | | | **5** | **5** | **6** | **4** |
| | | | | | | |
| **Minimum indigenous species per vegetation group** | | | **21** | **17** | **20** | **14** |

# APPENDIX C: PLANT SPECIES COMPLIANCE REPORT

(CONFIDENTIAL -NOT FOR PUBLICATION)

**Compliance with the Protocol for The Specialist Assessment and Minimum Report Content Requirements for Environmental Impacts on Plant Species as it pertains to a compliance statement**

| Compliance statement requirements for plant species | Section in this report |
|---|---|
| 5.1 The compliance statement must be prepared by a SACNASP registered specialist under one of the two fields of practice (Botanical Science or Ecological Science). | Yes<br>Appendix D: CV |
| 5.2 The compliance statement must:<br>5.2.1 be applicable within the study area; | Yes |
| 5.2.2 confirm that the study area is of "low" sensitivity for terrestrial plant species; and | Section C5 Results |
| 5.2.3 indicate whether or not the proposed development will have any impact on SCC. | |
| 5.3.1 contact details and relevant experience as well as the SACNASP registration number of the specialist preparing the compliance statement including a curriculum vitae; | Appendix D: CV |
| 5.3.2 a signed statement of independence by the specialist; | see Terrestrial Vegetation Compliance Report |
| 5.3.3 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 C4 |
| 5.3.4 a description of the methodology used to undertake the site survey and prepare the compliance statement, including equipment and modelling used where relevant | Section C4 |
| 5.3.5 where required, proposed impact management actions and outcomes or any monitoring requirements for inclusion in the EMPr; | Section C5 Results |
| 5.3.6 a description of the assumptions made and any uncertainties or gaps in knowledge or data | Section C3: Assumptions and limitations |
| 5.3.7 the mean density of observations/ number of samples sites per unit area; | Section C4 |
| 5.3.8 any conditions to which the compliance statement is subjected | Section C3 and C4 |

## C1 INTRODUCTION

The national screening tool report as downloaded on 28/03/2025 at 15:04:45., classified the site as “medium for sensitive plant species”, indicating that suitable habitat for at least two (2) such species may be present, but there are no confirmed records for the site yet. Therefore, a plant species site verification must be undertaken to confirm the absence or likely occurrence of such species.

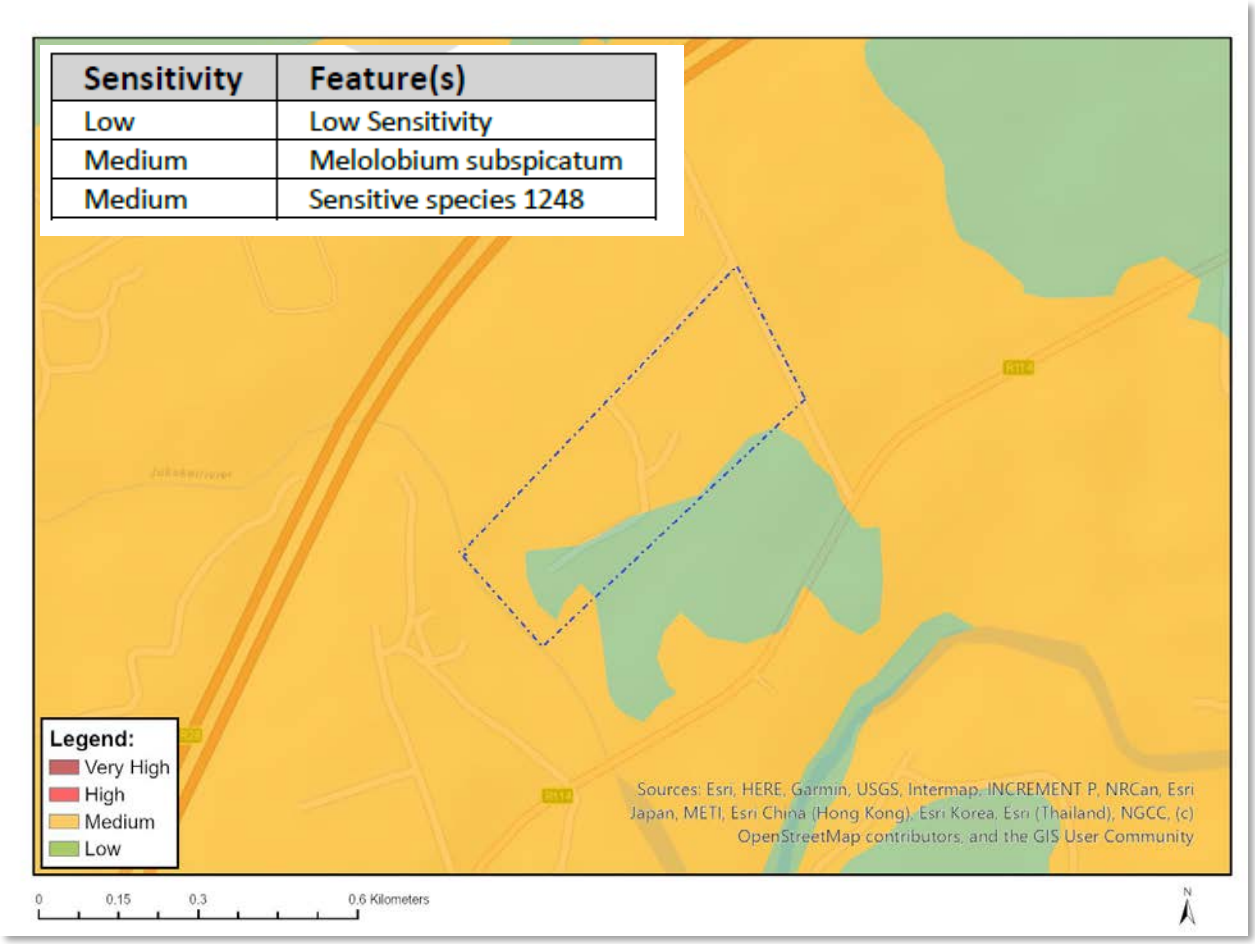


**Figure 17: The site is classified as medium plant species sensitivity (screening tool report, downloaded on 28/03/2025 at 15:04:45).**

An applicant intending to undertake an activity identified in the scope of the plant species protocol, on a site identified by the screening tool as being of “low” sensitivity for terrestrial plant species, must submit a Terrestrial Plant Species Compliance Statement, depending on the outcome of a site verification. However, areas of medium sensitivity should be assessed for species of concern. If such species are encountered a plant species assessment must be undertaken, whereas a compliance statement will suffice if no such species or their habitat is observed. This Appendix constitutes the results of a plant species site verification, as well as a compliance statement for the site.

## C2. DATA CONSULTED

The following data on plant species of conservation concern were consulted:

- National Web based Environmental Screening Tool Report generated on 28/03/2025 at 15:04:45.
- Data obtained from the Botanical Database of Southern Africa (BODATSA) for the map area as represented in Figure 18.
- Locality data from iNaturalist.org.
- Historic data for the QDS that the site is situated in (Lorraine Mills, GDARD)

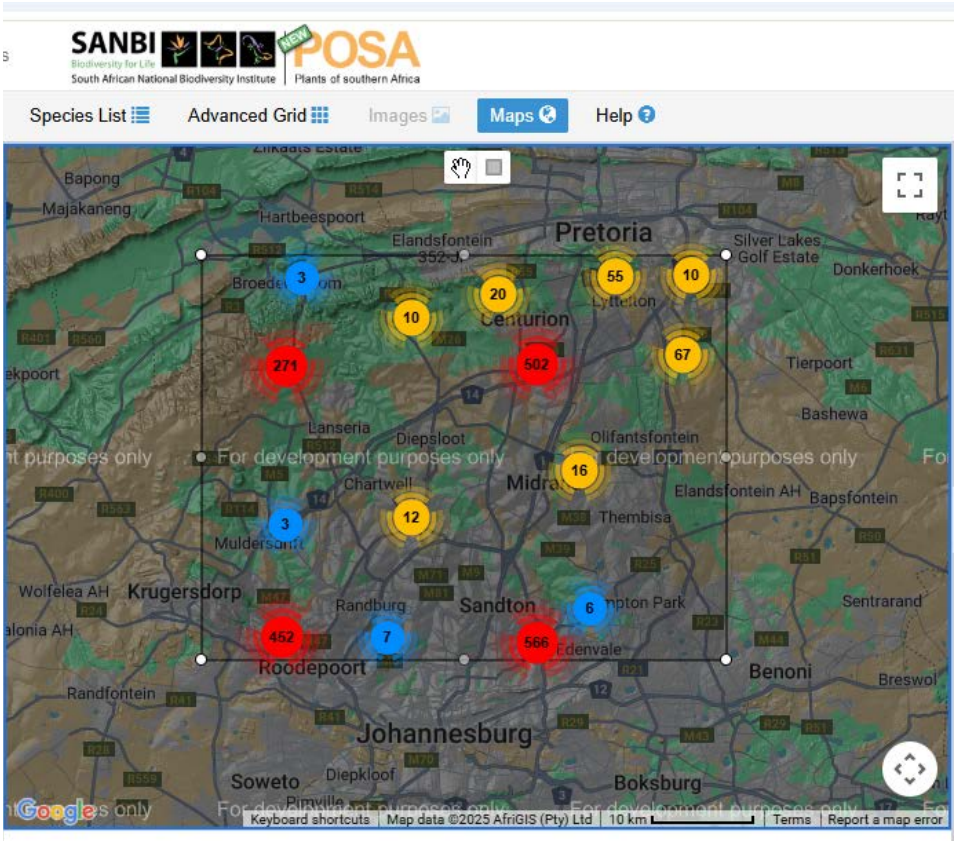


**Figure 18: Reviewed grid area on the Botanical Database of Southern Africa (BODATSA) http://posa.sanbi.org/***

*This website provides access to South African plant names (taxa), specimens (herbarium sheets) and observations of plants made in the field (botanical records). Data is obtained from the Botanical Database of Southern Africa (BODATSA), which contains records from the National Herbarium in Pretoria (PRE), the Compton Herbarium in Cape Town (NBG & SAM) and the KwaZulu-Natal Herbarium in Durban (NH).

## C3 ASSUMPTIONS AND LIMITATIONS

Only one on-site habitat assessment was undertaken on 22 April 2025. Some threatened species would not have been in flower, however, due to the past disturbances and low likelihood of occurrence, this was not considered a fatal flaw.

At the time of the site assessment, good rains resulted in dense vegetation cover. Dense grasses could have obscured smaller threatened or cryptic species.

## C4 SITE VERIFICATION

The site verification was undertaken on 22 April 2025. The site was walked. A map of the walked transects and sample plots are given Appendix A. At several sites along the transects, a survey of total visible floristic composition was undertaken. Plant identification and vegetation description relied on species recorded in the sampling points along the walked transects.

## C5 RESULTS AND COMPLIANCE STATEMENT

The table below lists eight (8) species for which suitable habitat may be present on the site or surrounds, or that was historically recorded in the area that the site is situated in. The table also discusses whether suitable habitat for the species is present on or around the site.

Of the eight (8) species listed, suitable habitat is present for one species along the Jukskei River. None of the species listed below were recorded in walked transects at the time of this assessment.

**Table 11: Sensitive plant species, their habitat and likelihood of occurring (LOO)**

| Species | Conservation Status | Habitat notes | Flowering period | Suitable or confirmed habitat on site |
|---|---|---|---|---|
| *Sensitive species 1248* | Vulnerable | Occurs along mountain ranges, in thickly vegetated river valleys. Often grows under bush clumps and in boulder screes. | Sept-April | No suitable habitat within the project area of influence |
| *Brachycorythis conica subsp transvaalensis* | Vulnerable | Natural grasslands. | Jan-March | No suitable habitat within the project area of influence. This species is unlikely to persist in the secondary grassland |
| *Dicliptera magaliesbergensis* | Vulnerable | Savanna, riverine forest. Krugersdorp to Onderstepoort | Feb-April | **Likely occurrence along the Jukskei River**, however, this species was not recorded and unlikely to persist in mowed lawns. |
| *Cleome conrathii* | Near threatened | This annual grows on stony quartzite slopes, usually in red sandy soil, grassland, or deciduous woodland. | March-May; December-January | This species can be overlooked when not in flower and as an annual it might already have been dormant at the time of this assessment. However, |

| Species | Conservation Status | Habitat notes | Flowering period | Suitable or confirmed habitat on site |
|---|---|---|---|---|
| | | | | the secondary grassland is unlikely to support this species. |
| *Drimia sanguinea* | Near threatened | Open veld and scrubby woodland in a variety of soil types. | Aug-Dec | This bulb is unlikely to be present due to the historical cultivation of the secondary grasslands and is harvested for medicinal markets. |
| *Habenaria kraenzliniana* | Near threatened | Occurs in stony, grassy hillsides, mainly in Gauteng. | Feb-April | Suitable habitat is present within the secondary grasslands. Due to the historical cultivation of the secondary grasslands it is unlikely to be present |
| *Boophane disticha* | Declining in Gauteng– reclassified as Least Concern nationally | It occurs on rocky grasslands. This plant is easily identifiable even if not in flower. | Oct-Jan | Suitable habitat is present within the secondary grasslands; however, this plant was not recorded in walked transects and unlikely to be present. |
| *Eucomis autumnalis* | Declining in Gauteng– reclassified as LC nationally) | Occurs in rocky grasslands and sometimes in seepage areas. | Nov-April | **Suitable habitat is present within the moist grasslands**; however, this species was not recorded in walked transect at the time of the assessment |

The assessment disagrees with the national screening tool report of medium plant species sensitivity for the site. Due to the secondary nature of the grassland, no plant species of conservation concern were recorded or are expected to be present in either the secondary grasslands or moist grassland. This is further based on the lack of suitable habitat for species in the table above, historic distribution of such species and historical disturbances to the vegetation on the site. One (1) species is likely to occur along the Jukskei River. Due to prescribed buffers around watercourses, this species habitat is undevelopable and no edge effects from activities on the site should be allowed to impact on the watercourse and buffer area.

If no development is planned in or close to the Jukskei River, no further plant species assessment is deemed necessary.

# APPENDIX D: SPECIALIST CURRICULUM VITAE FOR ANTOINETTE EYSSELL-KNOX

## Personal Information Summary

| | |
|---|---|
| Name: | Antoinette Eyssell- Knox |
| Highest qualification: | MSc Environmental Science (2010), University of Pretoria |
| Professional membership: | SACNASP Pr Sci Nat (400019/11) Ecological Science |
| Company: | Dimela Eco Consulting |
| Contact details: | Antoinette@dimela-eco.co.za |
| | Tel 083 642 6295 |

## Professional Experience

1. Environmental Management:

I have been working in the field of environmental management as a vegetation specialist since the year 2007 (11 years). I have been self-employed since November 2011.

| | |
|---|---|
| Nov 2011 – current: | Dimela Eco Consulting |
| Sep 2007 – Nov 2011: | Strategic Environmental Focus (SEF) |

Main field of work and experience include:

- Vegetation assessments, overviews or scans;
- Strategic ecological assessments;
- Ecological management, rehabilitation- and biodiversity action plans (including alien vegetation management);
- Specialist input: Gauteng and North-West Outlook Reports, ecological conditional requirements for Green Star rating;
- Ground-truthing of vegetation related data;
- Review of ecological reports; and
- Mentoring.

2. Environmental Education:

| | |
|---|---|
| 2011 – current: | Writer of the ecology feature for the bimonthly Supernova Kids Magazine |
| Aug 2003 – Sep 2007: | Snr Environmental Education Officer, South African National Biodiversity Institute (SANBI), Pretoria National Botanical Garden |

3. Horticulture

| | |
|---|---|
| Jun – Jul 2003: | Horticultural Trainer, 7 Shaft Training Centre, Johannesburg |
| May 1997 – Mar 2002 | Horticulturist, Pretoria National Botanical Garden (then NBI, now SANBI) |

## Qualifications

- M.Sc Environmental Science, University of Pretoria (2010)

Dissertation: *Land cover change and its effect on future land uses*

- B. Sc (Hons) Horticulture, University of Pretoria (1999-2000)

Dissertation: *Horticultural uses of the indigenous Barleria species*

- B. Sc (Agriculture) Horticulture, University of Pretoria (1993-1996)

## Memberships and Affiliations

SACNASP: Registered as a Professional Natural Scientist in the field of ecology since 2011 (Reg no 400019/11)

Botsoc: Member of the Botanical Society of Southern Africa since 2013

## Course History

| | |
|---|---|
| 2018: | Asteraceae Identification Course |
| 2015: | SAGIC Invasive Species Consultant Training |
| 2012: | Tools for Wetland Assessment (Rhodes University – September 2012) |
| 2012: | Landscape Functional Assessment, introductory workshop with David Tongway and Prof Klaus Kellner (North West University) |
| 2012: | Soil Classification and Wetland Delineation (Terra Soil) |
| 2007: | ISO 14000 Advanced EMS Auditors Course (SGS & University of Pretoria) |
| 2007: | Introduction into Forestry Stewardship Council (FSC) (University of Pretoria) |
| 2006: | Permaculture training course (S.E.E.D) |
| 2005: | Project Management Course (Wildlife and Environment Society of South Africa (WESSA) Umgeni Valley) |
| 2004: | Grass and plant identification courses |

## Presentations

| | |
|---|---|
| July 2007: | Environmental Education in a changing world, World Environmental Education Conference (WEEC), Durban |
| Sept2006: | Environmental Education, BGCI Conference, Oxford England |

## Selected Project Experience (2011 onwards)

1. Provincial Environmental Outlook Reports

| | |
|---|---|
| 2017-2018: | Vegetation input: Gauteng Outlook Report |
| *in process*: | Vegetation input: North-West Outlook Report |

2. Open Space Planning

| | |
|---|---|
| Nov 2015: | The proposed Kaalspruit Open Space Project, Thembisa, Gauteng. Kaalspruit River Rehabilitation Biodiversity Scan: (NuLeaf Planning and Environmental) |
| 2015-2016: | City of Johannesburg Open Space Planning – vegetation input for Linbro Park, Bassonia, Kyalami and Ruimsig areas (Iggdrasil) |

## 3. Management- and Rehabilitation Plans

April-May 2012: Vegetation base line study and input into Biodiversity Action Plan for Kumba Iron Ore (Lidwala Consulting Engineers)

Jan 2015: Environmental Management Plan for the Krugersdorp Nature Reserve – vegetation section

Jan 2016: Tharisa Mine Railway Line – Vegetation rehabilitation plan (Limosella Consulting)

Sept 2016: General vegetation rehabilitation plan for the proposed Mezo Kitchens Panel Processing Facility (Shangoni)

Nov 2016: General Ecological Rehabilitation and Monitoring Plan for the N4 additional lane between: R52 Koster offramp & D1325 Marikana Interchange; and The R512 (Brits West Interchange) & K67 (Ga-Rankuwa Interchange) North West and Gauteng Provinces

Nov 2016: Biodiversity Management Plan: Afrisam (Sa) (Pty) Ltd, Dudfield Cement – vegetation input

June 2017: Rehabilitation planning for the Klip- Lower and Upper Rietspruit Water Management Units (Pregio, via Limosella Consulting)

Dec 2017: Eskom underground cable river crossings – vegetation input into rehabilitation plants (Envirolution)

## 4. Linear Infrastructure

March 2012: Kranspoort road upgrade Protected tree identification (Lidwala Consulting Engineers)

Oct 2012: Eskom: Perseus to Gamma Vegetation assessment (Mokgope Consulting)

March 2013: Diepsloot Eskom line and substation, Johannesburg (Envirolution)

Nov 2013: Masa Ngwedi 750kV and 400kV lines (Limpopo & North-West Provinces) Section D & E Vegetation Input for EMP (Mandara Consulting)

2013-2014 Eskom: Northern Alignments (Perseus in the Northern Cape to Juno in the Western Cape) (Mokgope Consulting)

Feb 2014: Meteor substation, as well as the 88kV line between the Pulsar, Meteor and Sonland substations, Sebokeng, (Nsovo Environmental Consulting)

Dec2014: Upgrading of Internal Roads in Stinkwater, Hammanskraal (Gauteng) (GladAfrica)

Sept 2015: Railway Siding for GCMC Open Cast Mine, Lephalale (Limpopo)

Feb 2016: N4 - Additional lane between Brits and Rustenburg (Environamic)

Nov 2016: Aggeneis-Paulputs 400kV Powerline and Substations Upgrades

Feb 2017: Proposed Lulamisa to Diepsloot East to Blue Hills to Crowthorne 88kv Power Line / Cable and 2 Substations Gauteng (Envirolution)

May 2017: Proposed 132 kV Powerline Between Fochville Municipal Substation and an Existing Line, Gauteng Province (Envirolution)

## 5. Solar Developments

January 2012: Schmidsdrift, Northern Cape Vegetation Assessment for Solar Panels (Nuleaf)

Aug 2015: Proposed Construction of A 75mw Solar Energy Facility Project, Limpopo Tshikovha Environmental and Communication Consulting

## 6. Mining

April 2012: Rietfontein Open Cast Vegetation assessment (Cabanga Concepts)

Jan 2013: Vierfontein Colliery Vegetation assessment and EMP input (Cabanga Concepts)

Jan 2017: G&W Base and Industrial Minerals Koppies Betonite Mine Vegetation Assessment & Management Input Report (Cabanga Concepts)

## 7. Other Development

Dec 2013: Marekele Bush camp – vegetation & fauna assessments (NuLeaf)

May 2013: Komati Power Station – Coal stockyard (Envirolution)

April 2014: Blesboklaagte & Leeupoort Township development (Shangoni)

May 2014: Goldi Farm Composting Site, Section 24G Fauna and Flora assessment and Summary document (Shangoni)

Feb 2015: TOPIGS: Proposed Piggery,Mpumalanga(Shangoni)

May 2015: Kwaggasrant Recycling Facility Upgrade (Shangoni)

Oct 2016: Proposed piggery on portion 139 of the farm Honingnestkrans 269JR Vegetation and Fauna investigation (Methale Environmental Consulting)

Oct 2017: Ongoing Clinic Development & Proposed Emergency Medical Services Facility on Prt 79 of the farm De Wagendrift 417 JR Gauteng Province. (Methale Environmental Consultants)

## 8. Plant relocation and monitoring

April 2014: Relocation of *C bulbipermum,* overlooked Colliery in Mpumalanga (Cabanga Concepts)

Feb 2017: Monitoring report for the relocated *Crinum bulbispermum* at Overlooked Colliery

May 2017: Relocation of protected plant species: Evander Mine

## 9. International:

Oct 2009: Tatu, Nairobi: Vegetation Assessment (Kenya) (Lokisa Environmental Consulting)

Sept 2014: Vegetation input to the Regional Environmental and Social Assessment of Coal-based Energy Projects along the South Africa- Botswana Border (World bank Project, Mott MacDonald)

## 10. Mentorship:

May 2017: Technical Peer Review of the vegetation section for the Emfuleni Bulk Water Supply Pipelines: Ecological Assessment. GIBB Engineering & Architecture (Pty) Ltd

Nov 2017: Mentorship and Technical Peer Review of the vegetation section for the Merensky-Kennedy Powerline: vegetation assessment GIBB Engineering & Architecture (Pty) Ltd