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**FLORAL ECOLOGICAL SCAN AND INDIGENOUS  
VEGETATION VERIFICATION ASSESSMENT AS PART OF  
THE ENVIRONMENTAL AUTHORISATION PROCESS FOR  
THE PROPOSED CABLE REPAIR WORKSHOP AT THE  
MOGALAKWENA COMPLEX, LIMPOPO PROVINCE**

**Prepared for**

**SRK Consulting (South Africa) (Pty) Ltd**

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SAS Environmental Group of Companies

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## EXECUTIVE SUMMARY

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Scientific Terrestrial Services CC (STS) was appointed to conduct an assessment for indigenous vegetation<sup>1</sup> and floral ecological assessment as part of the Environmental Authorisation (EA) process to authorise the proposed cable repair workshop as part of a combined process with the Mogalakwena third Concentrator (M3C) pre-assembly yard (please refer to STS 210078, 2022). The proposed cable repair workshop area is hereafter referred to as the “**study area**”.

Following the field assessment, two habitat units were identified within the study area, namely the Disturbed Thornveld Habitat and the Secondary Thornveld Habitat. Indigenous vegetation was identified within the Disturbed Thornveld Habitat, however, was not recorded within the Secondary Thornveld Habitat. The presence (or absence) of indigenous vegetation was determined based on the definition provided in the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA) Listing Notices – Activity 27 of Listing Notice 1 (GNR 327) and Activity 12 of Listing Notice 3 (GNR 324) were checked for relevance. The habitat units were determined based on species composition, vegetation structure, ecological function, biophysical environment, and habitat condition. The habitat units identified included:

- **Disturbed Thornveld Habitat** – This habitat unit comprises the smallest extent of the study area (approximately 2 hectare (ha)) and indigenous vegetation was identified within the Habitat. The habitat has been impacted by surrounding disturbances, such as historic mining (which occurred more than 10 years ago) and edge effects (e.g., alien and Invasive Plant (AIP) proliferation). The floral communities are markedly less diverse than that of the surrounding natural habitat. Indigenous encroachment, particularly by *Dichrostachys cinerea* and several *Aloe* species have encroached heavily within the habitat.
- **Secondary Thornveld Habitat** – this habitat unit (the largest habitat within the study area, approximately 2.6 ha) was largely associated with areas of little to no vegetation, and in which indigenous vegetation was not recorded, in which significant disturbances have occurred. Generally, this habitat unit was characterised by a poorly developed forb layer. These areas have historically been transformed by mining activities and have not yet been rehabilitated. The resultant habitat is thus uneven and dominated by indigenous encroaching woody species as well as several listed AIP species.

The sensitivities, from a floral perspective, ranged from a **low sensitivity** (e.g., the Secondary Thornveld) to a **moderately low** (e.g., the Disturbed Thornveld Habitat).

No Threatened or Protected Species (TOPS) were observed during the field assessment. However, two protected tree species as per the National Forest Act, 1998 (Act No. 84 of 1998) (NFA), namely *Sclerocarya birrea* subsp. *caffra* and *Combretum imberbe* were identified within the study area. A provincially protected species as per the Limpopo Environmental Management Act, 2003 (Act No. 7 of 2003) (LEMA), namely *Heurnia* sp., was recorded within the Disturbed Thornveld Habitat and has the potential to occur within the Secondary Thornveld Habitat. If the construction of the cable repair workshop area is authorised, a summer season walkdown of the footprint area is recommended in which all species of conservation concern (SCC) are recorded and marked for permit application purposes (be it for rescue and relocation initiatives, or destruction of the specimens).

From a desktop perspective, the study area is not located within protected areas, threatened vegetation types, or threatened ecosystems. According to the Limpopo Conservation Plan (C-Plan, 2018), the study area is located entirely within an Ecological Support Area 1 (ESA1). However, the Disturbed Thornveld and the Secondary Thornveld Habitats has been significantly impacted by anthropogenic influences and edge effects. As such ESA habitat and associated connective corridors across the study area and surrounding area, was not confirmed for the study area during field assessments.

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<sup>1</sup> As per the NEMA listing notice definition, “indigenous vegetation” refers to vegetation consisting of indigenous plant species occurring naturally in an area, regardless of the level of alien infestation and where the topsoil has not been lawfully disturbed during the preceding 10 years.



The proposed project will not impact on indigenous vegetation within the Secondary Thornveld Habitat but will however impact on indigenous vegetation with the Disturbed Thornveld Habitat. The overall, combined significance of impacts on indigenous vegetation prior to the implementation of mitigation measures was medium across the study area. With the implementation of mitigation measures, the proposed impact significance is anticipated to be low.

It is the opinion of the ecologists that this study provides the relevant information required to implement Integrated Environmental Management (IEM) and to ensure that the best long-term use of the ecological resources in the study area will be made in support of the principle of sustainable development.

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## DOCUMENT GUIDE

The table below provides a guide to the reporting of biodiversity impacts as they relate to 1) Government Notice No. 320 Protocol for the Specialist Assessment and Minimum Report Content Requirements for Environmental Impacts on **Terrestrial Biodiversity** as published in Government Gazette 43110 dated 20 March 2020, and 2) Government Notice No. 1150 Protocol for the Specialist Assessment and Minimum Report Content Requirements for Environmental Impacts on **Terrestrial Plant and Animal Species** as published in Government Gazette 43855 dated 30 October 2020.

| Theme-Specific Requirements as per Government Notice No. 320<br>Terrestrial Biodiversity Theme – Very High Sensitivity Rating as per Screening Tool Output |   |   |
|--|---|---|
| No.  | SPECIALIST ASSESSMENT AND MINIMUM REPORT CONTENT REQUIREMENTS   | Section in report/Notes   |
| 2  | <b>Terrestrial Biodiversity Specialist Assessment</b>   |   |
| 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 H  |
| 2.2  | The assessment must be undertaken on the preferred site and within the proposed development footprint.  | Section 1   |
| <b>2.3</b>   | <b>The assessment must provide a baseline description of the site which includes, as a minimum, the following aspects:</b>  |   |
| 2.3.1  | A description of the ecological drivers or processes of the system and how the proposed development will impact these;  | Section 4   |
| 2.3.2  | Ecological functioning and ecological processes (e.g., fire, migration, pollination, etc.) that operate within the preferred site;  | Section 4   |
| 2.3.3  | The ecological corridors that the proposed development would impede including migration and movement of flora and fauna;  | Section 4   |
| 2.3.4  | The description of any significant terrestrial landscape features (including rare or important flora-faunal associations, presence of Strategic Water Source Areas (SWSAs) or Freshwater Ecosystem Priority Area (FEPA) sub catchments;   | Section 3<br><i>Please refer to Freshwater Assessment (SAS 202298, 2022) for additional details and explanations.</i> |
| 2.3.5  | A description of terrestrial biodiversity and ecosystems on the preferred site, including: <ul style="list-style-type: none"> <li>a) main vegetation types;</li> <li>b) threatened ecosystems, including listed ecosystems as well as locally important habitat types identified;</li> <li>c) ecological connectivity, habitat fragmentation, ecological processes and fine scale habitats; and</li> <li>d) species, distribution, important habitats (e.g. feeding grounds, nesting sites, etc.) and movement patterns identified;</li> </ul>  | Section 3 (desktop analysis)<br>Section 4   |
| 2.3.6  | The assessment must identify any alternative development footprints within the preferred site which would be of a “low” sensitivity as identified by the screening tool and verified through the site sensitivity verification; and   | Not Applicable  |
| <b>2.3.7</b>   | <b>The assessment must be based on the results of a site inspection undertaken on the preferred site and must identify:</b>   |   |
| 2.3.7.1  | Terrestrial Critical Biodiversity Areas (CBAs), including: <ul style="list-style-type: none"> <li>a) <i>the reasons why an area has been identified as a CBA;</i></li> <li>b) <i>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;</i></li> <li>c) <i>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);</i></li> <li>d) <i>the impact on ecosystem threat status;</i></li> <li>e) <i>the impact on explicit subtypes in the vegetation;</i></li> <li>f) <i>the impact on overall species and ecosystem diversity of the site; and</i></li> <li>g) <i>the impact on any changes to threat status of populations of species of conservation concern in the CBA;</i></li> </ul> | Section 3 (desktop analysis), Section 4, & Section 6  |



|            |  |   |
|------------|--|---|
| 2.3.7.2    | Terrestrial Ecological Support Areas (ESAs), including: <ul style="list-style-type: none"> <li>a) <i>the impact on the ecological processes that operate within or across the site;</i></li> <li>b) <i>the extent the proposed development will impact on the functionality of the ESA; and</i></li> <li>c) <i>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;</i></li> </ul> |   |
| 2.3.7.3    | Protected areas as defined by the National Environmental Management: Protected Areas Act, 2003 including- <ul style="list-style-type: none"> <li>a) <i>an opinion on whether the proposed development aligns with the objectives or purpose of the protected area and the zoning as per the protected area management plan;</i></li> </ul>   | Section 3 (desktop analysis), Section 4, & Section 6  |
| 2.3.7.4    | Priority areas for protected area expansion, including- <ul style="list-style-type: none"> <li>a) <i>the way in which the proposed development will compromise or contribute to the expansion of the protected area network;</i></li> </ul>  | Section 3 (desktop analysis)  |
| 2.3.7.5    | SWSAs including: <ul style="list-style-type: none"> <li>a) <i>the impact(s) on the terrestrial habitat of a SWSA; and</i></li> <li>b) <i>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);</i></li> </ul>  | Section 3 (desktop analysis)<br>Please refer to Freshwater Assessment (SAS 202298, 2022) for additional details and explanations. |
| 2.3.7.6    | FEPA sub catchments, including- <ul style="list-style-type: none"> <li>a) <i>the impacts of the proposed development on habitat condition and species in the FEPA sub catchment;</i></li> </ul>  | Not Applicable. Please refer to Freshwater Assessment (SAS 202298, 2022) for additional details and explanations.                 |
| 2.3.7.7    | Indigenous forests, including: <ul style="list-style-type: none"> <li>a) <i>impact on the ecological integrity of the forest; and</i></li> <li>b) <i>percentage of natural or near natural indigenous forest area lost and a statement on the implications in relation to the remaining areas.</i></li> </ul>  | Not Applicable. No forests associated with the study area.  |
| <b>2.4</b> | <b>The findings of the assessment must be written up in a Terrestrial Biodiversity Specialist Assessment Report.</b>   |   |
|            | Results of the <b>Floral Assessment</b> as well as conclusions on Terrestrial Biodiversity as it relates to vegetation communities are in <b>Sections 4 – 6</b> .  |   |
| <b>3</b>   | <b>Terrestrial Biodiversity Specialist Assessment Report</b>   |   |
| <b>3.1</b> | <b>The Terrestrial Biodiversity Specialist Assessment Report must contain, as a minimum, the following information:</b>  |   |
| 3.1.1      | Contact details of the specialist, their SACNASP registration number, their field of expertise and a curriculum vitae;   | Appendix H  |
| 3.1.2      | A signed statement of independence by the specialist;  | Appendix H  |
| 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 1.3   |
| 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<br>Appendices C, D & E  |
| 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 (where relevant);  | Section 5   |
|            | <b>Impact Assessment Requirements</b>  |   |
|            | 3.1.7 Additional environmental impacts expected from the proposed development;   | Section 6   |
|            | 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;  |   |



|        |  |  |
|--------|--|--|
|        | 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;   | <b>Not Applicable to this report</b>   |
| 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   | Executive Summary & Section 7  |
| 3.1.15 | Any conditions to which this statement is subjected.   | Section 5 & 6  |
| 3.2    | The findings of the Terrestrial Biodiversity Specialist Assessment must be incorporated into the Basic Assessment Report or the Environmental Impact Assessment Report, including the mitigation and monitoring measures as identified, which must be incorporated into the EMPr where relevant. | This report is submitted to the EAP and applicant and will be appended to the EIA / EMP by the EAP in due course as part of the application process. |
| 3.3    | A signed copy of the assessment must be appended to the Basic Assessment Report or Environmental Impact Assessment Report.   |  |



## TABLE OF CONTENTS

|  |           |
|--|-----------|
| <b>EXECUTIVE SUMMARY</b> .....                                     | <b>ii</b> |
| <b>DOCUMENT GUIDE</b> .....  | <b>ii</b> |
| <b>TABLE OF CONTENTS</b> .....                                     | <b>1</b>  |
| <b>LIST OF FIGURES</b> .....                                       | <b>2</b>  |
| <b>LIST OF TABLES</b> .....  | <b>2</b>  |
| <b>GLOSSARY OF TERMS</b> .....                                     | <b>3</b>  |
| <b>LIST OF ACRONYMS</b> .....                                      | <b>5</b>  |
| <b>1. INTRODUCTION</b> .....                                       | <b>1</b>  |
| 1.1 Project Description .....                                      | 1         |
| 1.2 Project Scope .....  | 2         |
| 1.3 Assumptions and Limitations .....                              | 5         |
| 1.4 Legislative Requirements .....                                 | 5         |
| <b>2. ASSESSMENT APPROACH</b> .....                                | <b>6</b>  |
| 2.1 Desktop Research Approach .....                                | 6         |
| 2.2 General Approach .....   | 7         |
| 2.3 Sensitivity Mapping.....                                       | 9         |
| <b>3. RESULTS OF THE DESKTOP ANALYSIS</b> .....                    | <b>10</b> |
| 3.1 Conservation Characteristics of the Study Area.....            | 10        |
| <b>4. BIODIVERSITY ASSESSMENT RESULTS</b> .....                    | <b>18</b> |
| 4.1 Broad-scale vegetation characteristics .....                   | 18        |
| 4.2 Ground-truthed vegetation characteristics .....                | 18        |
| 4.3 Floral Assessment Results .....                                | 21        |
| 4.4 Alien and Invasive Plant (AIP) Species.....                    | 25        |
| 4.4.1 Legal Context .....  | 25        |
| 4.4.2 Site Results .....   | 26        |
| <b>5. SENSITIVITY MAPPING</b> .....                                | <b>27</b> |
| <b>6. IMPACT ASSESSMENT</b> .....                                  | <b>30</b> |
| 6.1 Impact Assessment Tables.....                                  | 30        |
| 6.2 Impact Discussion .....  | 40        |
| 6.2.1 Impact on Floral Ecology .....                               | 40        |
| <b>7. CONCLUSION</b> .....   | <b>43</b> |
| <b>8. REFERENCES</b> .....   | <b>44</b> |
| <b>APPENDIX A: Indemnity and Terms of Use of this Report</b> ..... | <b>46</b> |
| <b>APPENDIX B: Legislative Requirements</b> .....                  | <b>47</b> |
| <b>APPENDIX C: Floral Method of Assessment</b> .....               | <b>50</b> |
| <b>APPENDIX D: Impact Assessment Methodology (SRK)</b> .....       | <b>54</b> |
| <b>APPENDIX E: Vegetation Type(s)</b> .....                        | <b>57</b> |
| <b>APPENDIX F: Species List</b> .....                              | <b>58</b> |
| <b>APPENDIX G: Floral SCC</b> .....                                | <b>61</b> |
| <b>APPENDIX H: Declaration and Specialists CV's</b> .....          | <b>71</b> |



## LIST OF FIGURES

|            |  |    |
|------------|--|----|
| Figure 1:  | Digital Satellite image depicting the location of the study area in relation to surrounding areas.....   | 3  |
| Figure 2:  | The study area depicted on a 1:50 000 topographical map in relation to the surrounding area.....   | 4  |
| Figure 3:  | The vegetation type, as identified by the 2018 VEGMAP, associated with the study area.....   | 13 |
| Figure 4:  | The remaining extent of Makhado Sweet Bushveld vegetation type according to the National Biodiversity Assessment (NBA, 2018) in relation to the study area. According to the NBA (2018) the study area does not fall within the remaining extent of the vegetation type..... | 14 |
| Figure 5:  | National protected & conservation areas within a 10 km radius of the study area as identified by the SAPAD (2021, Q3) and NPAES (2010).....  | 15 |
| Figure 6:  | The study area in relation to the various CBA categories as indicated in the Limpopo Biodiversity Conservation Plan (2018).....  | 16 |
| Figure 7:  | The importance of the study area in relation to Mining & Biodiversity Guidelines (2012).....   | 17 |
| Figure 8:  | Map illustrating the habitat units associated with the study area on a macroscale.....   | 19 |
| Figure 9:  | Map illustrating the habitat units associated with indigenous vegetation within the study area on a macroscale.....  | 20 |
| Figure 10: | Map illustrating the floral sensitivity associated with the study area, on a macroscale.....   | 29 |

## LIST OF TABLES

|          |   |    |
|----------|---|----|
| Table 1: | Summary of the terrestrial conservation characteristics for the study area (Quarter Degree Square (QDS) 2328DD).....  | 10 |
| Table 2: | Alien and invasive plant species associated with the study area.....  | 27 |
| Table 3: | A summary of the floral sensitivity of each habitat unit and implications for development.....  | 28 |
| Table 4: | Summary of the Impact Assessment of the i) Pre-Construction & Planning, ii) Construction & Operational (i.e., Mining Phase), and iii) Decommissioning & Rehabilitation Phases of the proposed construction of the cable repair workshop area..... | 31 |





## GLOSSARY OF TERMS

Most definitions are based on terms and concepts elaborated by Richardson *et al.* (2011), Hui and Richardson (2017) and Wilson *et al.* (2017), with consideration to their applicability in the South African context, especially South African legislation [notably the National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004) (NEMBA), and the associated Alien and Invasive Species Regulations, 2020].

|   |  |
|---|--|
| <b>Alien species</b><br>(syn. exotic species; non-native species)               | A species that is present in a region outside its natural range due to human actions (intentional or accidental) that have enabled it to overcome biogeographic barriers.  |
| <b>Biological diversity or Biodiversity</b><br>(as per the definition in NEMBA) | The variability among living organisms from all sources including, terrestrial, marine, and other aquatic ecosystems and the ecological complexes of which they are part and also includes diversity within species, between species, and of ecosystems.   |
| <b>Biome - as per Mucina and Rutherford (2006)</b>                              | A broad ecological spatial unit representing major life zones of large natural areas – defined mainly by vegetation structure, climate, and major large-scale disturbance factors (such as fires).   |
| <b>Bioregion (as per the definition in NEMBA)</b>                               | A geographic region which has in terms of section 40(1) been determined as a bioregion for the purposes of this Act;   |
| <b>Critical Biodiversity Area (CBA)</b>   | A CBA is an area considered important for the survival of threatened species and includes valuable ecosystems such as wetlands, untransformed vegetation, and ridges.  |
| <b>Corridor</b>   | A dispersal route or a physical connection of suitable habitats linking previously unconnected regions.  |
| <b>Disturbance</b>  | A temporal change, either regular or irregular (uncertain), in the environmental conditions that can trigger population fluctuations and secondary succession. Disturbance is an important driver of biological invasions.   |
| <b>Ecoregion</b>  | An ecoregion is a "recurring pattern of ecosystems associated with characteristic combinations of soil and landform that characterise that region".  |
| <b>Endangered</b>   | Organisms in danger of extinction if causal factors continue to operate.   |
| <b>Endemic species</b>  | Species that are only found within a pre-defined area. There can therefore be sub-continental (e.g., southern Africa), national (South Africa), provincial, regional, or even within a particular mountain range.  |
| <b>Ecological Support Area (ESA)</b>  | An ESA provides connectivity and important ecological processes between CBAs and is therefore important in terms of habitat conservation.  |
| <b>Ground-truth</b>   | Ground truth is a term used in various fields to refer to information provided by direct observation (i.e., empirical evidence) as opposed to information provided by inference.   |
| <b>Habitat</b><br>(as per the definition in NEMBA)                              | A place where a species or ecological community naturally occurs.  |
| <b>Indigenous vegetation</b><br>(as per the definition in NEMA)                 | Vegetation occurring naturally within a defined area, regardless of the level of alien infestation and where the topsoil has not been lawfully disturbed during the preceding ten years.   |
| <b>Integrity (ecological)</b>   | The integrity of an ecosystem refers to its functional completeness, including its components (species) its patterns (distribution) and its processes.   |
| <b>Invasive species</b>   | Alien species that sustain self-replacing populations over several life cycles, produce reproductive offspring, often in very large numbers at considerable distances from the parent and/or site of introduction, and have the potential to spread over long distances.   |
| <b>Listed alien species</b>   | All alien species that are regulated in South Africa under the NEMBA, Alien and Invasive Species Regulations, 2020.  |
| <b>Least Threatened</b>   | Least threatened ecosystems are still largely intact.  |
| <b>Native species</b><br>(syn. indigenous species)                              | Species that are found within their natural range where they have evolved without human intervention (intentional or accidental). Also includes species that have expanded their range as a result of human modification of the environment that does not directly impact dispersal (e.g., species are still native if they increase their range as a result of watered gardens but are alien if they increase |



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|  |   |
|--|---|
|  | their range as a result of spread along human-created corridors linking previously separate biogeographic regions).   |
| <b>Red Data Listed (RDL) species</b>         | According to the Red List of South African plants ( <a href="http://redlist.sanbi.org/">http://redlist.sanbi.org/</a> ) and the International Union for Conservation of Nature (IUCN), organisms that fall into the Extinct in the Wild (EW), Critically Endangered (CR), Endangered (EN), Vulnerable (VU) categories of ecological status. |
| <b>Species of Conservation Concern (SCC)</b> | The term SCC in the context of this report refers to all RDL and IUCN listed threatened species as well as provincially and nationally protected species of relevance to the project.   |



## LIST OF ACRONYMS

|          |  |
|----------|--|
| AIP      | Alien and Invasive Plant   |
| ARC      | Agricultural Research Council  |
| BA       | Basic Assessment   |
| BAP      | Biodiversity Action Plan   |
| BGIS     | Biodiversity Geographic Information Systems  |
| BODATSA  | Botanical Database of Southern Africa  |
| CARA     | Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983)  |
| CBA      | Critical Biodiversity Area   |
| C-Plan   | Conservation Plan  |
| CR       | Critically Endangered  |
| DAFF     | Department of Agriculture, Forestry and Fisheries  |
| DEA      | Department of Environmental Affairs  |
| DFFE     | Department of Forestry, Fisheries, and the Environment   |
| EA       | Environmental Authorisation  |
| EAP      | Environmental Assessment Practitioner  |
| E-GIS    | Environmental Geographical Information Systems   |
| EIA      | Environmental Impact Assessment  |
| EMPr     | Environmental Management Programme   |
| EN       | Endangered   |
| ESA      | Ecological Support Area  |
| EW       | Extinct in the Wild  |
| FEPA     | Freshwater Ecosystem Priority Area   |
| GBIF     | Global Biodiversity Information Facility   |
| GIS      | Geographic Information System  |
| GN       | Government Notice  |
| GPS      | Global Positioning System  |
| Ha       | Hectare  |
| IEM      | Environmental Management   |
| IUCN     | International Union for Conservation of Nature   |
| LC       | Least Concern  |
| LEDET    | Limpopo Department of Economic Development, Environment & Tourism  |
| LEMA     | Limpopo Environmental Management Act, 2003 (Act No. 7 of 2003)   |
| MAP      | Mean Annual Precipitation  |
| MAPE     | Mean Annual Potential Evaporation  |
| MASMS    | Mean Annual Soil Moisture Stress (% of days when evaporative demand was more than double the soil moisture supply) |
| MAT      | Mean Annual Temperature  |
| MFD      | Mean Frost Days  |
| NBA      | National Biodiversity Assessment   |
| NFA      | National Forest Act, 1998 (Act No. 84 of 1998)   |
| NEMA     | National Environmental Management Act, 1998 (Act No. 107 of 1998)  |
| NEMBA    | National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004)                                     |
| NPAES    | National Protected Area Expansion Strategy   |
| NT       | Near threatened  |
| P        | Protected  |
| PES      | Present Ecological State   |
| POC      | Probability of Occurrence  |
| QDS      | Quarter Degree Square  |
| RDL      | Red Data Listed  |
| SABAP 2  | South African Bird Atlas Project 2   |
| SACAD    | South African Conservation Areas Database  |
| SACNASP  | South African Council for Natural Scientific Professionals   |
| SANBI    | South African National Biodiversity Institute  |
| SanParks | South African National Parks   |
| SAPAD    | South African Protected Areas Database   |



|               |                                    |
|---------------|------------------------------------|
| <b>SCC</b>    | Species of Conservation Concern    |
| <b>STS</b>    | Scientific Terrestrial Services CC |
| <b>SWSA</b>   | Strategic Water Source Area        |
| <b>TOPS</b>   | Threatened or Protected Species    |
| <b>TSP</b>    | Threatened Species Programme       |
| <b>VEGMAP</b> | National Vegetation Map Project    |
| <b>VU</b>     | Vulnerable                         |
| <b>WSAs</b>   | Water Source Areas                 |



# 1. INTRODUCTION

Scientific Terrestrial Services CC (STS) was appointed to conduct an assessment for indigenous vegetation<sup>2</sup> and floral ecological assessment as part of the Environmental Authorisation (EA) process to authorise the proposed cable repair workshop as part of a combined process with the Mogalakwena third Concentrator (M3C) pre-assembly yard (please refer to STS 210078, 2021). The proposed cable repair workshop area is hereafter referred to as the “**study area**” (Figure 1).

The study area is situated approximately 30 km northwest of the town of Mokopane (formerly Potgietersrus) within the Mogalakwena Local Municipality, which forms part of the greater Waterberg District Municipality of the Limpopo Province. The study area is bordered by the Bakenberg Road in the southwest and is located approximately 400 m west the Mogalakwena North Concentrator. For a detailed project description, please refer to Section 1.1 below.

This report, after consideration of the description of the ecological integrity of the study area, must guide the Environmental Assessment Practitioner (EAP), the regulatory authorities and the developing proponent, by means of the presentation of results and recommendations as to the viability of the proposed development activities from a biodiversity resource management perspective.

## 1.1 Project Description

The Mogalakwena Complex is a wholly owned subsidiary of Anglo-American Platinum Limited and was originally called the Potgietersrust Platinum Mine.

At present, the Mogalakwena Complex has a cable repair workshop which is located close to the Central Pit. The existing cable repair workshop is for repairing/maintaining cables for primary equipment. The Mogalakwena Complex is currently investigating further mining of the North Pit. Due to this, the cable repair workshop will need to be removed as it is within the blasting radius. The main objective of this project is to construct a new cable repair workshop to replace the existing cable repair workshop to continue mining the North Pit. It is anticipated that the overall site area which will be cleared will be approximately 2 ha and the enclosed area will be 5500m<sup>2</sup>. The location and extent of the proposed cable repair workshop, i.e., the study area, in relation to surrounding areas is illustrated in Figures 1 & 2.

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<sup>2</sup> As per the NEMA listing notice definition, “indigenous vegetation” refers to vegetation consisting of indigenous plant species occurring naturally in an area, regardless of the level of alien infestation and where the topsoil has not been lawfully disturbed during the preceding 10 years.



## 1.2 Project Scope

Specific outcomes in terms of this report are outlined below:

- To state the indemnity and terms of use of this report (Appendix A) as well as to provide the details of the specialists who prepared the reports (Appendix H);
- To outline the legislative requirements that were considered for the assessment (Appendix B of this report);
- Compile a desktop assessment with all relevant information as presented by South African National Biodiversity Institute (SANBI)'s Biodiversity Geographic Information Systems (BGIS) website (<http://bgis.sanbi.org>) and the Environmental Geographical Information Systems (E-GIS) website (<https://egis.environment.gov.za/>). The desktop assessment aims to gain background information on the physical habitat and potential floral ecology associated with the study area;
- To define the Present Ecological State (PES) of the biodiversity of the study area;
- To determine and describe habitats, communities and the ecological state of the study area;
- To determine the presence and/or absence of indigenous vegetation within the study area (including the extent thereof);
- To conduct a floral Species of Conservation Concern (SCC) assessment, including the potential of suitable habitat to occur within the study area for SCC;
- To identify and consider all sensitive landscapes, including rocky ridges, wetlands or any other special features such as Critical Biodiversity Areas (CBAs) and Ecological Support Areas (ESAs);
- To determine the environmental impacts that the construction of the proposed cable repair workshop might have on the biodiversity associated with the study area; and
- To develop mitigation and management measures for all phases of the proposed project activities as they relate to the clearance of indigenous vegetation and floral ecology.



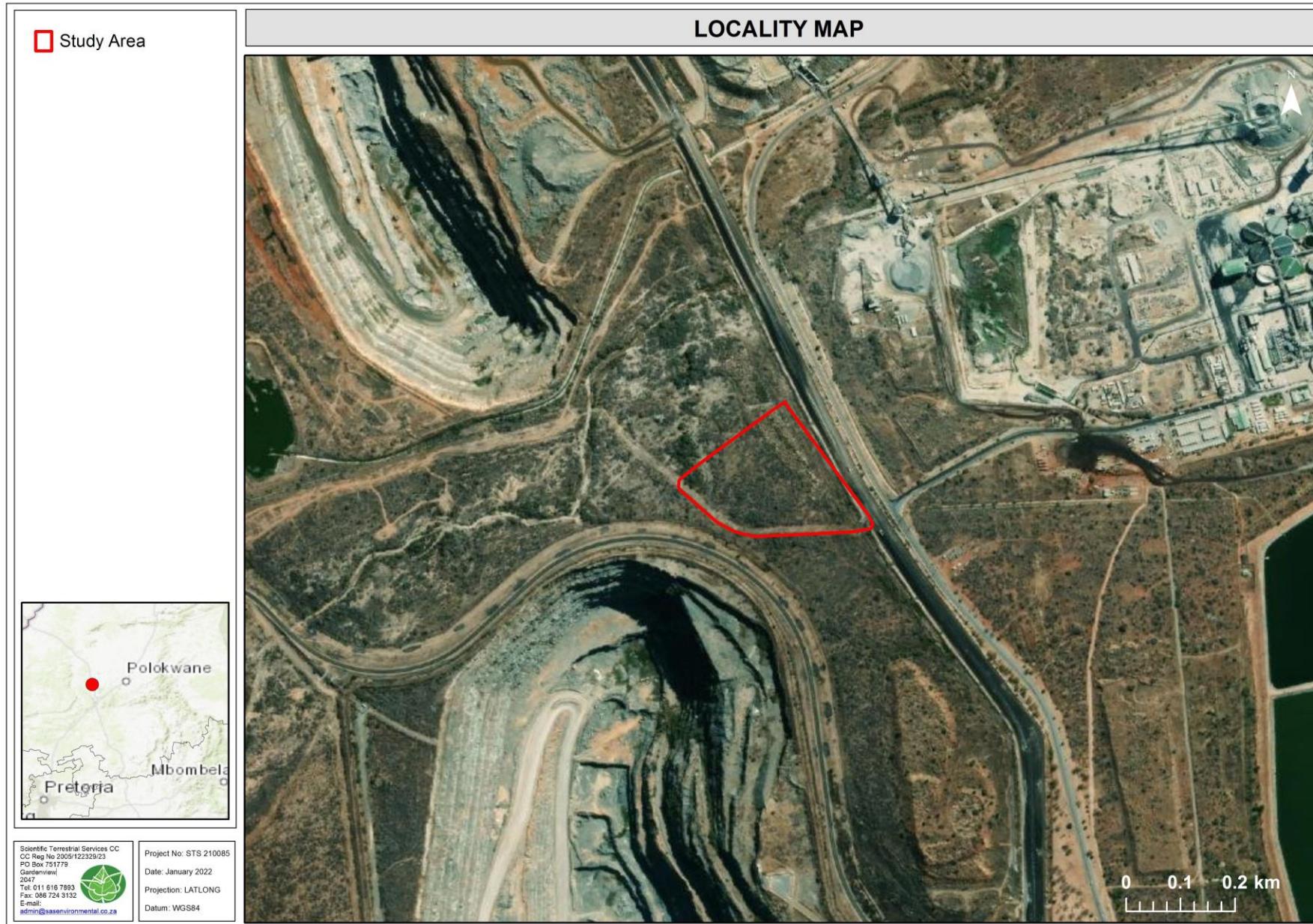


Figure 1: Digital Satellite image depicting the location of the study area in relation to surrounding areas.



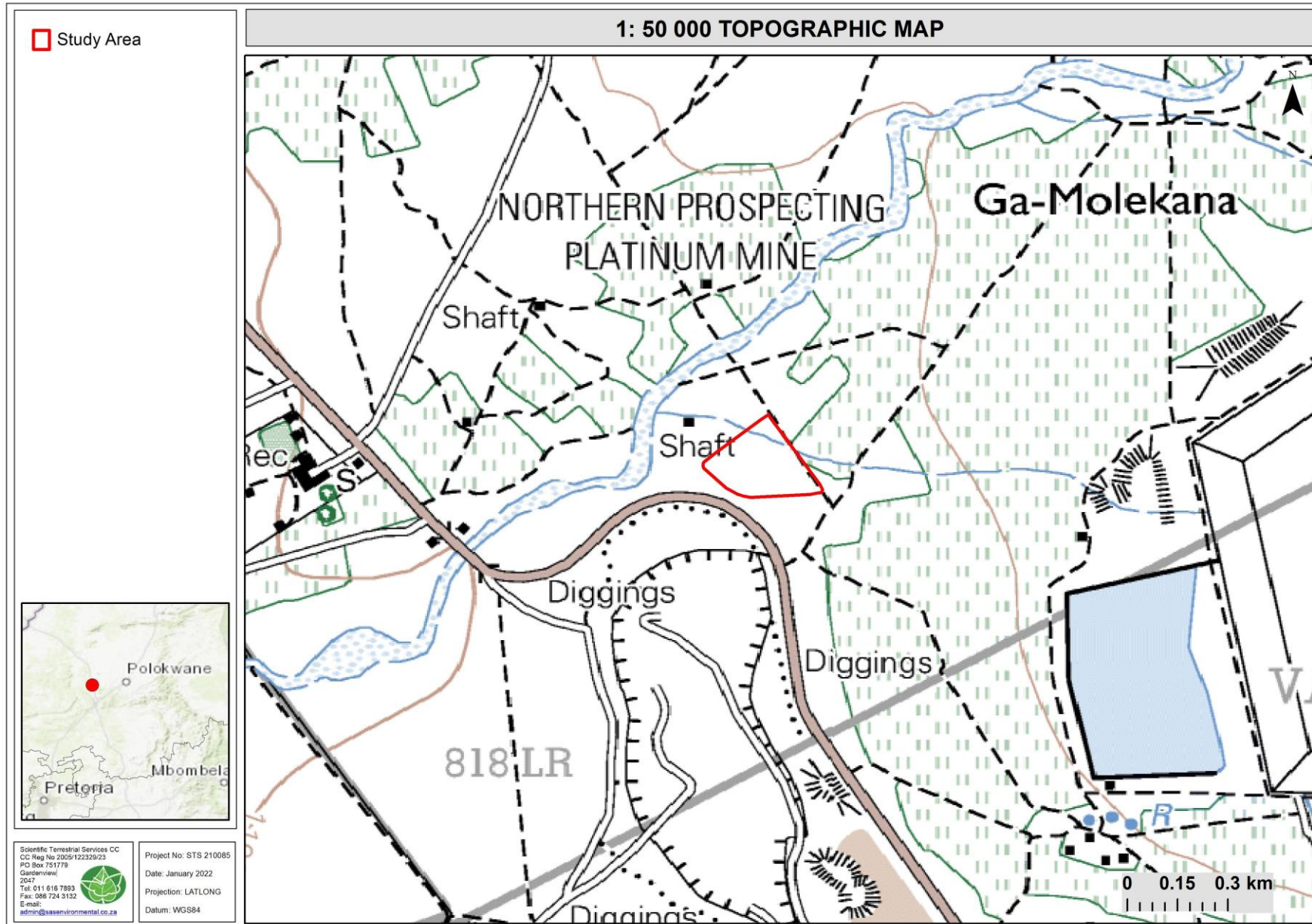


Figure 2: The study area depicted on a 1:50 000 topographical map in relation to the surrounding area.





### 1.3 Assumptions and Limitations

The following assumptions and limitations apply to this report:

- The biodiversity desktop assessment is confined to the study area and does not include detailed results of the surrounding areas or adjacent properties although ecologically important or sensitive areas according to the desktop databases of the surrounding areas have been included on the relevant maps;
- Sampling, by its nature, means that not all individuals are assessed and identified. Some species and taxa associated with the study area may have been missed during the assessment. It is, however, expected that most floral communities have been accurately assessed and considered. Relevant online sources, background information, and previous studies (e.g., STS 210037, 2021; STS 210042, 2021; and STS 200035, 2020), were further assessed to improve on the overall understanding of the study area's ecology; and
- With ecology being dynamic and complex, some aspects (some of which may be important) may have been overlooked. The data presented in this report are based on one site visit undertaken on the 25<sup>th</sup> – 26<sup>th</sup> November 2021. A more comprehensive assessment would require that assessments take place in all seasons of the year. However, on-site data were augmented with all available desktop data. Together with project experience in the area the findings of this assessment are considered an accurate reflection of the ecological characteristics of the study area.

### 1.4 Legislative Requirements

The following legislative requirements were considered during the assessment:

- The Constitution of the Republic of South Africa, 1996<sup>3</sup>;
- The Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983) (CARA);
- The National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA);
- The National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004) (NEMBA);
  - Government Notice (GN) number R.1020: Alien and Invasive Species Regulations, 2020, in Government Gazette 43735 dated 25 October 2020 as it relates to the NEMBA;

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<sup>3</sup> Since 1996, the Constitution has been amended by seventeen amendments acts. The Constitution is formally entitled the 'Constitution of the Republic of South Africa, 1996'. It was previously also numbered as if it were an Act of Parliament – Act No. 108 of 1996 – but since the passage of the Citation of Constitutional Laws Act, neither it nor the acts amending it are allocated act numbers.



- GN number 1003: Alien and Invasive Species Lists, 2020, in Government Gazette 43726 dated 18 October 2020;
- Government Gazette 45421 dated 10 May 2019 as it relates to the Department of Forestry, Fisheries, and the Environment (DFFE's) (previously the Department of Environmental Affairs (DEA)) national environmental screening report required with an application for EA as identified in regulation 16(1)(v) of Environment Impact Assessment (EIA) Regulations, 2014, as amended:
  - GN No. 320 Protocol for the Specialist Assessment and Minimum Report Content Requirements for Environmental Impacts on Terrestrial Biodiversity as published in Government Gazette 43110 dated 20 March 2020; and
  - GN No. 1150 Protocol for the Specialist Assessment and Minimum Report Content Requirements for Environmental Impacts on Terrestrial Plant and Terrestrial Animal Species as published in Government Gazette 43855 dated 30 October 2020.
- The Limpopo Environmental Management Act, 2003 (Act No.7 of 2003) (LEMA).

The details of each of the above, as they pertain to this study, are provided in **Appendix B** of this report.

## 2. ASSESSMENT APPROACH

### 2.1 Desktop Research Approach

Maps and digital satellite images were generated prior to the field assessment in order to determine broad habitats, vegetation types and potentially sensitive sites. The biodiversity desktop assessment is confined to the study area and does not include the neighbouring and adjacent properties, although the sensitivity of surrounding areas is included on the respective maps. Relevant databases and documentation that were considered during the assessment of the study area included <sup>4</sup>:

- 2010 National Protected Area Expansion Strategy (NPAES) (Government of South Africa, 2010; DEA & SANBI, 2009), including the below-listed vector datasets:

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<sup>4</sup> Datasets obtained from:

- SANBI BGIS (2019). The South African National Biodiversity Institute - Biodiversity GIS (BGIS) [online]. URL: <http://bgis.sanbi.org> as retrieved in 2019; and
- DEA Environmental Geographical Information Systems (E-GIS) website. URL: <https://egis.environment.gov.za/>



- NPAES Focus Areas 2010: National Protected Areas Expansion Strategy: Focus areas for protected area expansion (South African National Parks (SanParks), 2010);
- NPAES Formal: Polygons of formal protected national parks areas in South Africa (SANParks/SANBI, 2013); and
- NPAES Protected Areas – Informal: Informal conservation areas in South Africa (SANParks/SANBI, 2012).
- The South African Conservation Areas Database, Quarter 3 (SACAD, 2021);
- The South African Protected Areas Database, Quarter 3 (SAPAD, 2021);
- The National Vegetation Map Project (VEGMAP), with the below vector dataset used for information on Biomes, Bioregions and Vegetation Type(s):
  - 2018 Final Vegetation Map of South Africa, Lesotho and Swaziland (SANBI, 2018a).
- The National List of Threatened Ecosystems 2011 (SANBI 2011; South Africa, 2011);
- From the National Biodiversity Assessment (NBA, 2018) Terrestrial Assessment project (Skowno et al., 2019):
  - 2018 Terrestrial ecosystem threat status and protection level - remaining extent (SANBI, 2018b); and
  - 2018 Terrestrial ecosystem threat status and protection level layer (SANBI, 2018c).
- The National Screening Tool (accessed 2021);
- From the 2017 Strategic Water Source Areas (SWSA) project:
  - 2017 SWSA **Surface water** (Water Research Commission, 2017); and
- The Limpopo Conservation Plan (C-Plan) 2018 (LEDET, 2018).

## 2.2 General Approach

The presence (or absence) of indigenous vegetation was determined based on the definition provided in the NEMA Listing Notices – Activity 27 of Listing Notice 1 (GNR 327) and Activity 12 of Listing Notice 3 (GNR 324) were checked for relevance (see Box 1 below).

An on-site visual assessment of the study area was conducted to confirm the assumptions made during the consultation of the background maps and to determine whether the ecological status of the habitat associated with the study area has changed.



| BOX 1  |
|--|
| <b>Activity 27 of Listing Notice 1 (GNR 327)</b>   |
| The clearance of an area of <b>1 hectare or more, but less than 20 hectares</b> of indigenous vegetation, except where such clearance of indigenous vegetation is required for- <ol style="list-style-type: none"> <li>i. the undertaking of a linear activity; or</li> <li>ii. maintenance purposes undertaken in accordance with a maintenance management plan.</li> </ol>   |
| <b>Activity 12 of Listing Notice 3 (GNR 324)</b>   |
| The area that will be cleared for development will be more than 300 m <sup>2</sup> of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan <p style="text-align: center;">Within the Limpopo Province:</p> <ol style="list-style-type: none"> <li>i. Within any critically endangered or endangered ecosystem listed in terms of section 52 of the NEMBA or prior to the publication of such a list, within an area that has been identified as critically endangered in the National Spatial Biodiversity Assessment 2004;               <ol style="list-style-type: none"> <li>ii. Within critical biodiversity areas identified in bioregional plans; or</li> <li>iii. On land, where, at the time of the coming into effect of this Notice or thereafter such land was zoned open space, conservation or had an equivalent zoning.</li> </ol> </li> </ol> |

The vegetation surveys are based on the subjective sampling method which is a technique where the specialist chooses specific sample sites within the area of interest, based on their professional experience and background research done for the site, to allow representative recordings of floral communities and optimal detection of SCC (**Appendix C**).

The below list includes the steps followed during the preparation for, and the undertaking of, the field assessments:

- To guide the selection of appropriate sample sites, background data and digital satellite images were consulted before going to the site, during which broad habitats, vegetation types and potentially sensitive sites were identified. The results of these analyses were then used to focus the fieldwork on specific areas of concern and to identify areas where targeted investigations were required (e.g., for SCC detection and within the direct footprint of the proposed parking area);
- Databases used for background information include the SANBI Threatened Species Programme (TSP), the NBA (2018), National Threatened Ecosystems (2011), SAPAD & SACAD (Quarter 3, 2021), and NPAES (2010);
- The subjective sampling method requires that field assessment take place on foot. Based on the broad habitat units delineated before going to the site, and points of interest recorded, which is updated based on on-site observations, the selected sample areas were surveyed on foot, following subjective transects, to identify the occurrence of the dominant plant species and habitat diversities, but also to detect SCC which tend to be sparsely distributed;
- Photographs were taken of each vegetation community that are representative of the typical vegetation structure of that community, as well as photos of all detected SCC (where such species were not flagged on the National Screening Tool as sensitive species for which identities may not be made known); and



- As part of the SCC assessment, the following classes were considered:
  - Threatened species. In terms of Section 56(1) of the National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004) (NEMBA), threatened species are Red Data Listed (RDL) species falling into the following categories of ecological status: Critically Endangered (CR), Endangered (EN), Vulnerable (VU) or Protected in terms of the NEMBA Threatened or Protected Species (TOPS) Regulations (General Notice (GN) R152 of 2007, as amended). Removal, translocation and/or destruction of these species require authorisation from the DFFE.
  - Protected Species. Species that do not necessarily fall in the above categories of ecological status, but that are deemed important from a provincial biodiversity perspective, e.g., LEMA provides a list of Specially Protected Plants (Schedule 11) and Protected Plants (Schedule 12) for the Limpopo Province for which restricted activities may not occur without permits from the relevant provincial authorities. The List of Protected Tree Species (GN No. 536) as published in the Government Gazette 41887 dated 7 September 2018 as it relates to the NFA was also considered for the SCC assessment.

For the methodologies relating to the impact assessment and development of the mitigation measures, please refer to **Appendix D** of this report.

### **2.3 Sensitivity Mapping**

All the ecological features associated with the study area were considered, and sensitive areas were delineated using a Global Positioning System (GPS). A Geographic Information System (GIS) was used to project these features onto satellite imagery.



### 3. RESULTS OF THE DESKTOP ANALYSIS

#### 3.1 Conservation Characteristics of the Study Area

The following table contains data accessed as part of the desktop assessment. It is important to note, that although all data sources used provide useful and often verifiable high-quality data, the various databases do not always provide an entirely accurate indication of the area's actual biodiversity characteristics. However, this information is useful as background information to the study and is important in legislative contextualisation of risk and impact and was used as a guideline to inform the assessment and to focus on areas and aspects of increased conservation importance. It must, however, be noted that site assessment of key areas may potentially contradict the information contained in the relevant databases, in which case the site verified information must carry more weight in the decision-making process.

**Table 1: Summary of the terrestrial conservation characteristics for the study area (Quarter Degree Square (QDS) 2328DD).**

| Details of the study area of interest in terms of Mucina & Rutherford (2006)       |  | Description of the vegetation type associated with the study area |   |
|--|--|---|---|
| <b>Biome</b>   | The study area is situated within the <b>Savanna Biome</b> .   | <b>Vegetation Type</b>  | Makhado Sweet Bushveld (SVcb 20)  |
| <b>Bioregion</b>   | The study area is located within the <b>Central Bushveld Bioregion</b>   | <b>Climate</b>  | Summer rainfall with very dry winters   |
| <b>Vegetation Type (Figure 3)</b>  | The study area is located within the <b>Makhado Sweet Bushveld (SVcb 20)</b> vegetation type.  | <b>Altitude (m)</b>   | 850 to 1200   |
|  |  | <b>MAP* (mm)</b>  | 454   |
|  |  | <b>MAT* (°C)</b>  | 18.5  |
| <b>Conservation details pertaining to the area of interest (various databases)</b> |  | <b>MFD* (Days)</b>  | 7   |
| <b>NBA (2018) (Figure 4)</b>   | The study area is located within the remaining extent of the <b>Makhado Sweet Bushveld</b> which is currently <b>Least Concerned</b> and <b>Poorly Protected</b> .<br><br>Ecosystem types are categorised <sup>5</sup> as “not protected”, “poorly protected”, “moderately protected” and “well protected” based on the proportion of each ecosystem type that occurs within a protected area recognised in the Protected Areas Act, 2003 (Act No. 57 of 2003), and compared with the biodiversity target for that ecosystem type. | <b>MAPE* (mm)</b>   | 2174  |
|  |  | <b>MASMS* (%)</b>   | 81  |
|  |  | <b>Distribution</b>   | Limpopo Province  |
|  |  | <b>Conservation</b>   | Vulnerable. Target 19%. About 1% statutorily conserved, mainly in the Bellevue Nature Reserve. Some 27% transformed, mainly by cultivation, with some urban and |

<sup>5</sup> The ecosystem protection level status is assigned using the following criteria:

- i. If an ecosystem type has more than 100% of its biodiversity target protected in a formal protected area either A or B, it is classified as Well Protected;
- ii. When less than 100% of the biodiversity target is met in formal A or B protected areas it is classified it as Moderately Protected;
- iii. If less than 50% of the biodiversity target is met, it is classified it as Poorly Protected; and
- iv. If less than 5% it is Hardly Protected.



|  |  |   |  |
|--|--|---|--|
|  |  |   | <p>built-up areas. The southwestern half of the unit has densely populated rural communities. Erosion is low to high.</p>  |
| <p><b>National Threatened Ecosystems (2011)</b></p>  | <p>The study area is not situated within a threatened ecosystem, according to the National Threatened Ecosystem Database (2011).</p> <p>The purpose of listing protected ecosystems is primarily to preserve witness sites of exceptionally high conservation value. The first national list of threatened terrestrial ecosystems for South Africa was gazetted on 9 December 2011 (National Environmental Management: Biodiversity Act: National list of ecosystems that are threatened and in need of protection, (G 34809, GoN 1002), 9 December 2011).</p> <p><b>Note:</b> <i>The National List of Threatened Terrestrial Ecosystems published in terms of the NEMBA in 2011 remains in legal force. The data contained in NBA 2018 represents an update of the assessment of threat status for terrestrial ecosystems, but the National List of Threatened Terrestrial Ecosystems has not yet been revised.</i></p> | <p><b>Geology and Soils</b></p>                   | <p>The area is underlain by the gneisses and migmatites of the Hout River Gneiss (Randian Erathem) and the potassium-deficient gneisses of the Goudplaats Gneiss (Swazian Erathem). Sandstones and mudstones of the Matlabas Subgroup (Mokolian Waterberg Group) are also found. Soils include deep, greyish sands, eutrophic plinthic catenas, red, yellow apedal freely drained soils with high base status, clayey in bottomlands. Land types<sup>6</sup> mainly Bd, Bc, Ae and Ia.</p> |
| <p><b>SAPAD (2021)<sup>7</sup>;<br/>SACAD (2021)<sup>8</sup>;<br/>NPAES (2010)<br/>(Figure 5)</b></p>    | <p>According to the SAPAD (2021_Q3) and the NPAES (2010), a protected area, namely the <b>Witvinger Nature Reserve</b>, is located within a 10 km radius of the study area (however not within 5 km of the reserve)<sup>9</sup>. Although the extent of the reserve (as indicated by the SAPAD and NPAES) vary, the SAPAD (2021_Q3) extent provides the most recent indication of the reserve’s current extent.</p> <p>The SACAD (2021_Q3) does not indicate the presence of any additional conservation areas within 10 km of the study area.</p>   | <p><b>Vegetation &amp; landscape features</b></p> | <p>Slightly to moderately undulating plains sloping generally down to the north, with some hills in the southwest. Short and shrubby bushveld with a poorly developed grass layer.</p> <p><b>Remark:</b> This area is transitional between the higher-lying Polokwane Plateau and the lower-lying vegetation units of the Limpopo River Valley.</p>  |
| <p><b>Detail of the area of interest in terms of the Limpopo Conservation Plan (2018) – Figure 6</b></p> |  |   |  |

<sup>6</sup> Land types refer to a class of land with specified characteristics. In South Africa it has been used as a unit denoting land at 1:250 000 scale, over which there is a marked uniformity of climate, terrain form and soil pattern. Land type Bd refers to non-red soils (Hu, Bv <33%) that are usually more dystrophic/mesotrophic than they are eutrophic. Land type Bc refers to upland duplex and marginal soils that have a Plinthic catena less than 10%, Land type Ae refers to Red (yellow soils <10%) that are more eutrophic than dystrophic/mesotrophic, and Land type Ia refers to a miscellaneous soil class.

<sup>7</sup> **SACAD (2021):** The types of conservation areas that are currently included in the database are the following: 1. Biosphere reserves, 2. Ramsar sites, 3. Stewardship agreements (other than nature reserves and protected environments), 4. Botanical gardens, 5. Transfrontier conservation areas, 6. Transfrontier parks, 7. Military conservation areas and 8. Conservancies.

<sup>8</sup> **SAPAD (2021):** The definition of protected areas follows the definition of a protected area as defined in the National Environmental Management: Protected Areas Act, (Act 57 of 2003). Chapter 2 of the National Environmental Management: Protected Areas Act, 2003 sets out the “System of Protected Areas”, which consists of the following kinds of protected areas - 1. Special nature reserves; 2. National parks; 3. Nature reserves; 4. Protected environments (1-4 declared in terms of the National Environmental Management: Protected Areas Act, 2003); 5. World heritage sites declared in terms of the World Heritage Convention Act; 6. Marine protected areas declared in terms of the Marine Living Resources Act; 7. Specially protected forest areas, forest nature reserves, and forest wilderness areas declared in terms of the National Forests Act, 1998 (Act No. 84 of 1998); and 8. Mountain catchment areas declared in terms of the Mountain Catchment Areas Act, 1970 (Act No. 63 of 1970).

<sup>9</sup> The Listing details applicable to the Limpopo Province (according to Listing Notice 3: List of Activities and Component Authorities Identified in Terms of Sections 24(2) and 240) state that “Areas within 10 km from national parks or world heritage sites or 5 km from any other protected area identified in terms of the National Environmental Management: Protected Areas Act, 2003 (Act No. 57 of 2003) (NEMPAA) or from the core area of a biosphere reserve” will trigger a Listing Activity. The Wit Vinger Nature Reserve is over 5 km from the study area. As per the listing notices, the listings are triggered only if the development is within 10 km of a World Heritage Site or a National Park or within 5 km of Nature Reserves. As the proposed development associated with the study area is not within 5 km of the Wit Vinger Nature, no listings are triggered.



|   |  |
|---|--|
| <b>ESA 1</b>  | <p>The entire study area is located within a <b>Category 1 Ecological Support Area (ESA)</b>. These are natural, near natural and/or degraded areas that are selected to support CBAs by maintaining ecological processes.</p> <p><b>Land Management Recommendations:</b> Implement appropriate zoning and land management guidelines to avoid impacting on ecological processes. Avoid intensification of land use and fragmentation of natural landscapes. <b>Incompatible Land-Use:</b> Urban land-uses including Residential (including golf estates, rural residential, resorts), Business, Mining &amp; Industrial; Infrastructure (roads, power lines, pipelines). <b>Note:</b> Certain elements of these activities could be allowed subject to detailed impact assessment to ensure that developments were designed to maintain the overall ecological functioning of ESAs.</p> |
| <b>Mining And Biodiversity Guidelines (2012) - Figure 7</b>   |  |
| <b>High Biodiversity Importance</b>   | <p>The entire study area is located within in an area of High Biodiversity Importance. These areas are regarded to pose a high risk for mining.</p> <p><b>Implications for mining:</b> An EIA should include an assessment of optimum, sustainable land use for a particular area and will determine the significance of the impact on biodiversity. Mining options may be limited in these areas, and red flags for mining projects are possible. Authorisations may set limits and specify biodiversity offsets that would be written into licence agreements and/or authorisations.</p>   |
| <b>National Web-based Screening Tool (accessed 2021)</b>  |  |
| <p>The screening tool is intended to allow for pre-screening of sensitivities in the landscape to be assessed within the EA process. this assists with implementing the mitigation hierarchy by allowing developers to adjust their proposed development footprint to avoid sensitive areas. The different sensitivity ratings pertaining to the Plant Protocols are described below:</p> <ul style="list-style-type: none"> <li>➤ <b>Very High:</b> Habitat for species that are endemic to South Africa, where all the known occurrences of that species are within an area of 10 km<sup>2</sup> are considered Critical Habitat, as all remaining habitat is irreplaceable. Typically, these include species that qualify under Critically Endangered (CR), Endangered (EN), or Vulnerable (VU) D criteria of the International Union for the conservation of Nature (IUCN) or species listed as Critically/ Extremely Rare under South Africa's National Red List Criteria. For each species reliant on a Critical Habitat, all remaining suitable habitat has been manually mapped at a fine scale.</li> <li>➤ <b>High:</b> Recent occurrence records for all threatened (CR, EN, VU) and/or rare endemic species are included in the high sensitivity level.</li> <li>➤ <b>Medium:</b> Model-derived suitable habitat areas for threatened and/or rare species are included in the medium sensitivity level.</li> <li>➤ <b>Low:</b> Areas where no SCC are known or expected to occur.</li> </ul> |  |
| <b>Terrestrial Biodiversity Theme</b>   | For the terrestrial biodiversity theme, the study area is considered to have an overall <b>sensitivity of High</b> . The triggering feature includes the presence of an ESA1.  |
| <b>Plant Species Theme</b>  | For the plant species theme, the entire study area is considered to have a <b>low sensitivity</b> .  |

NBA = National Biodiversity Assessment; SAPAD = South African Protected Areas Database; SACAD = South African Conservation Areas Database; NPAES = National Protected Areas Expansion Strategy; MAP = Mean annual precipitation; MAT = Mean annual temperature; MAPE = Mean annual potential evaporation; MFD = Mean Frost Days; MASMS = Mean annual soil moisture stress (% of days when evaporative demand was more than double the soil moisture supply); CBA = Critical Biodiversity Areas; ESA = Ecological Support Areas; SWSA = Strategic Water Source Areas; WSAs = Water Source Areas.





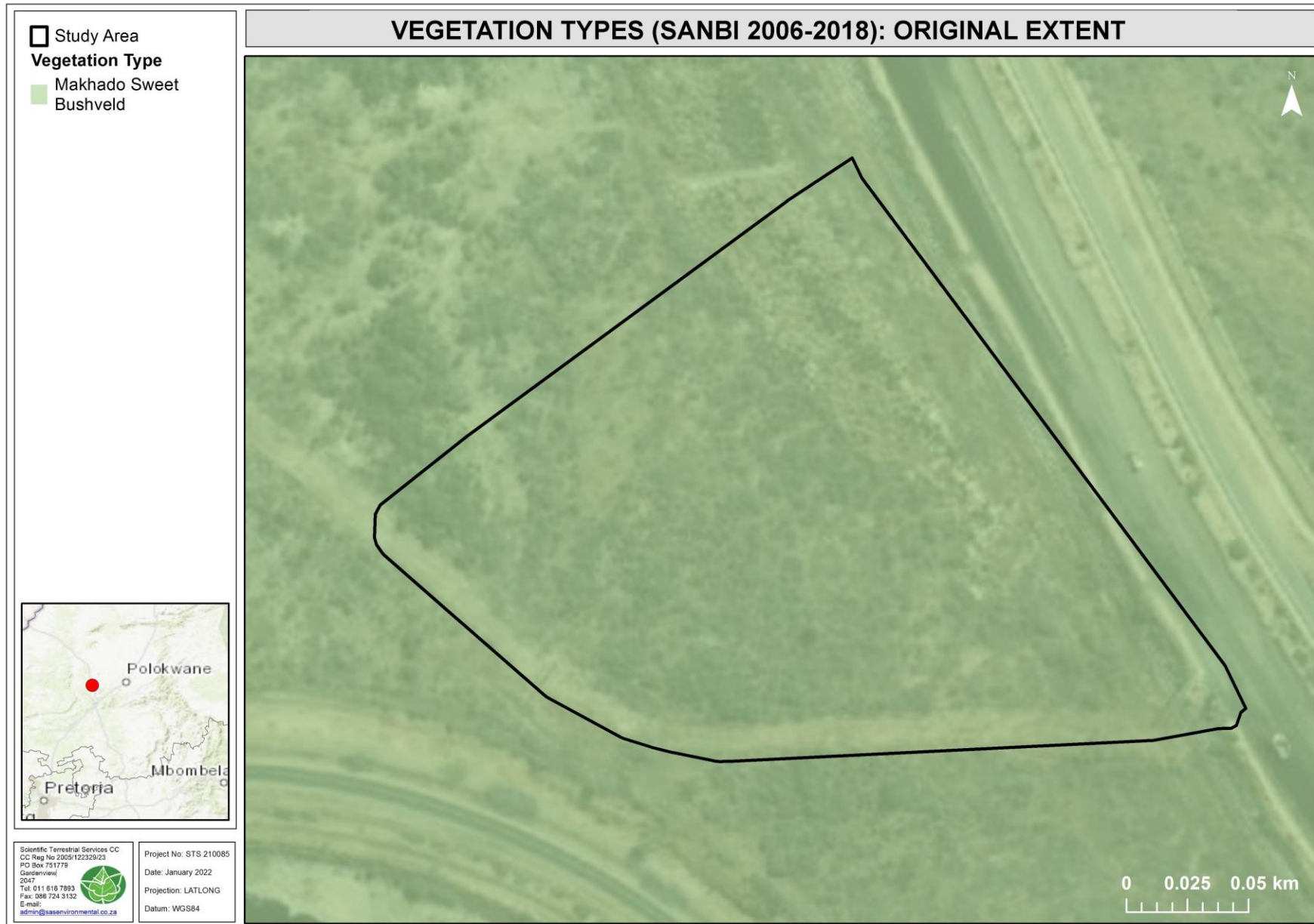
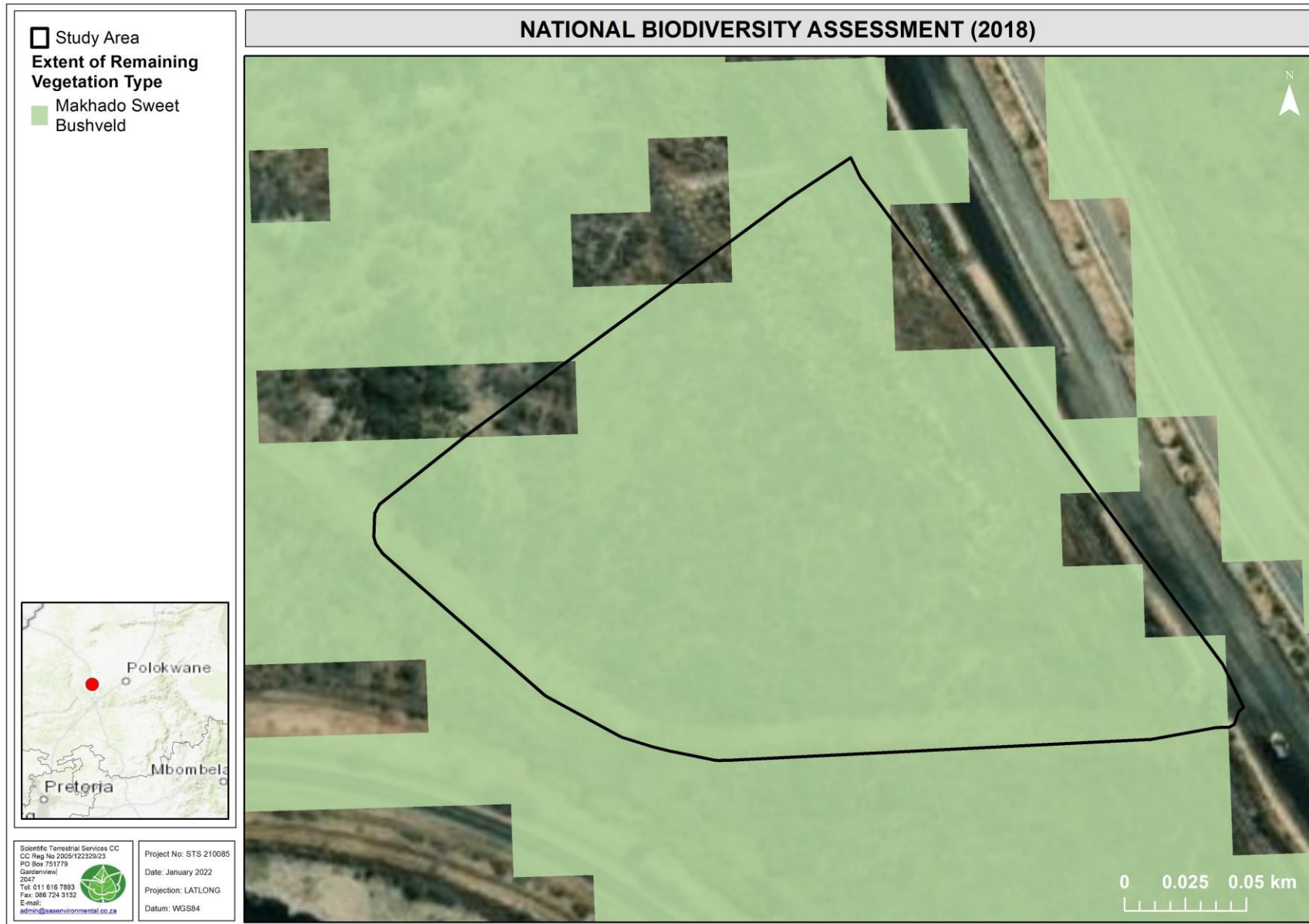


Figure 3: The vegetation type, as identified by the 2018 VEGMAP, associated with the study area.





**Figure 4: The remaining extent of Makhado Sweet Bushveld vegetation type according to the National Biodiversity Assessment (NBA, 2018) in relation to the study area. According to the NBA (2018) the study area does not fall within the remaining extent of the vegetation type.**



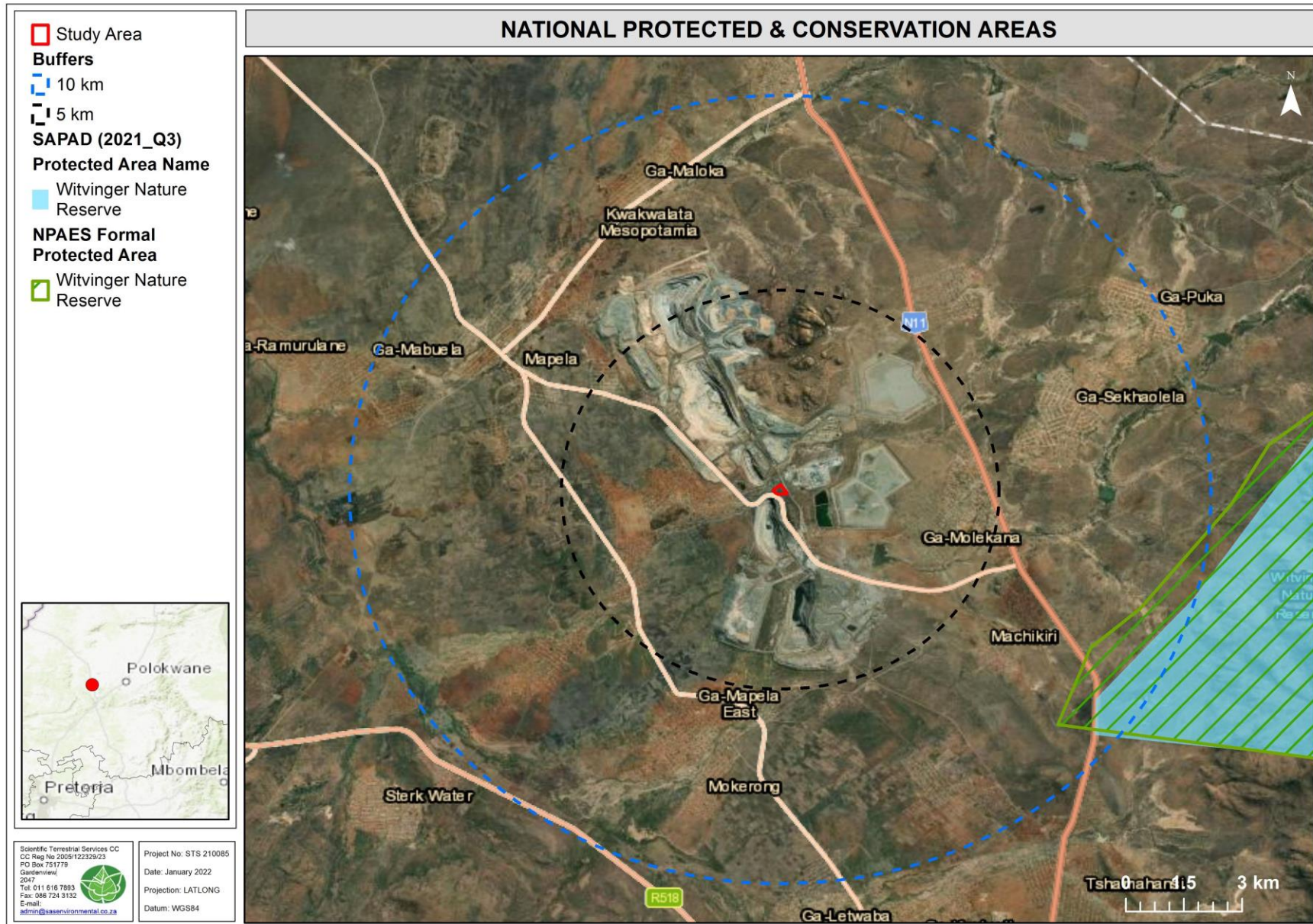


Figure 5: National protected & conservation areas within a 10 km radius of the study area as identified by the SAPAD (2021, Q3) and NPAES (2010).



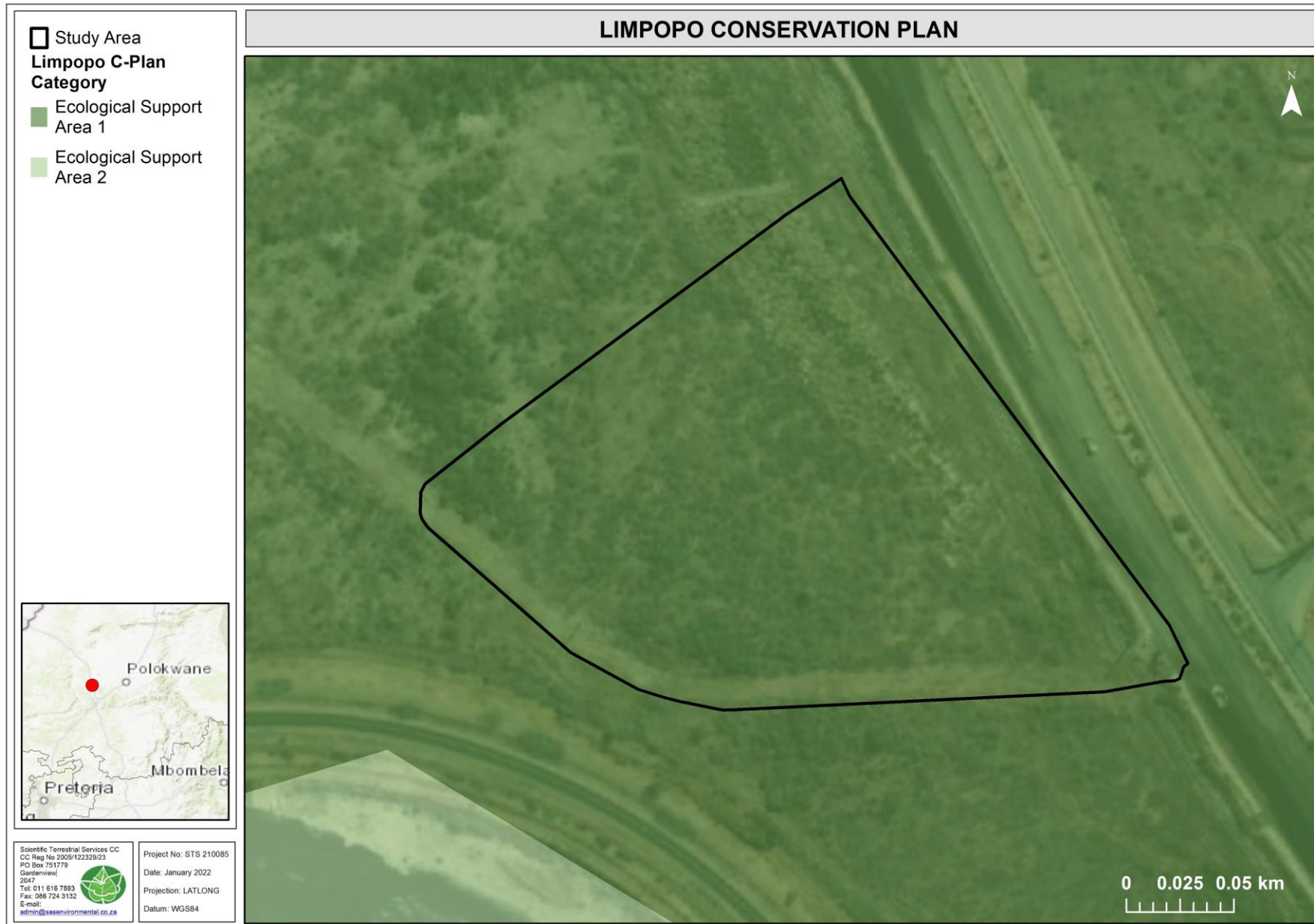


Figure 6: The study area in relation to the various CBA categories as indicated in the Limpopo Biodiversity Conservation Plan (2018).



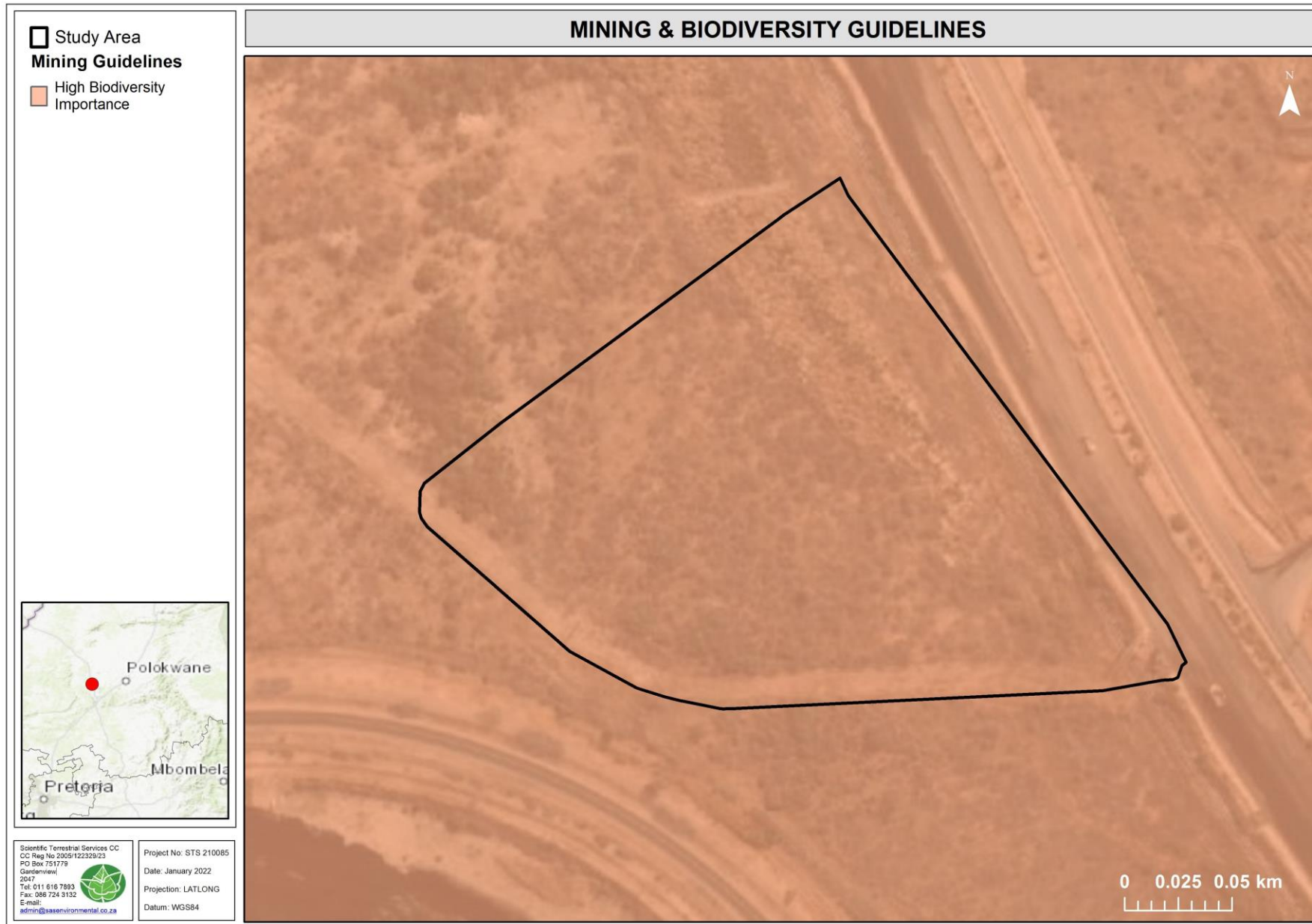


Figure 7: The importance of the study area in relation to Mining & Biodiversity Guidelines (2012).



## 4. BIODIVERSITY ASSESSMENT RESULTS

### 4.1 *Broad-scale vegetation characteristics*

The study area falls within the Makhado Sweet Thornveld vegetation type (listed as vulnerable in Mucina and Rutherford, 2006, but as Least Concern in the updated 2018 Vegetation Map of South Africa, Lesotho, and Swaziland (SANBI, 2018a)), i.e., the reference state. Mucina and Rutherford (2006) describe the Makhado Sweet Thornveld as having “slightly to moderately undulating plains generally sloping to the north, with some hills towards the south-west. This vegetation type is generally described as short and shrubby bushveld with a poorly developed grass layer”.

### 4.2 *Ground-truthed vegetation characteristics*

Overall, the habitat within the study area ranged from well-vegetated areas to transformed areas. The biodiversity of the study area can thus be defined under two broad habitat units as described below (Figure 8). Indigenous vegetation was recorded within the Disturbed Thornveld Habitat, but not within the Secondary Thornveld Habitat (Figure 9). These habitat units were distinguished based on species composition, vegetation structure, ecological function, physical nature of the environment and habitat condition. Results pertaining to the presence (or absence) of indigenous vegetation is also presented in Section 4.3.

The three broad habitat units include:

1. Disturbed Thornveld; and
2. Secondary Thornveld Habitat.

For a breakdown of the floral communities, habitat characteristics and conservation sensitivities associated with the above-mentioned habitat units, refer to Section 4.3 and Section 5. Figures 8 and 9 depicts the extent of the habitat units and the associated presence / absence of indigenous vegetation within the study area.



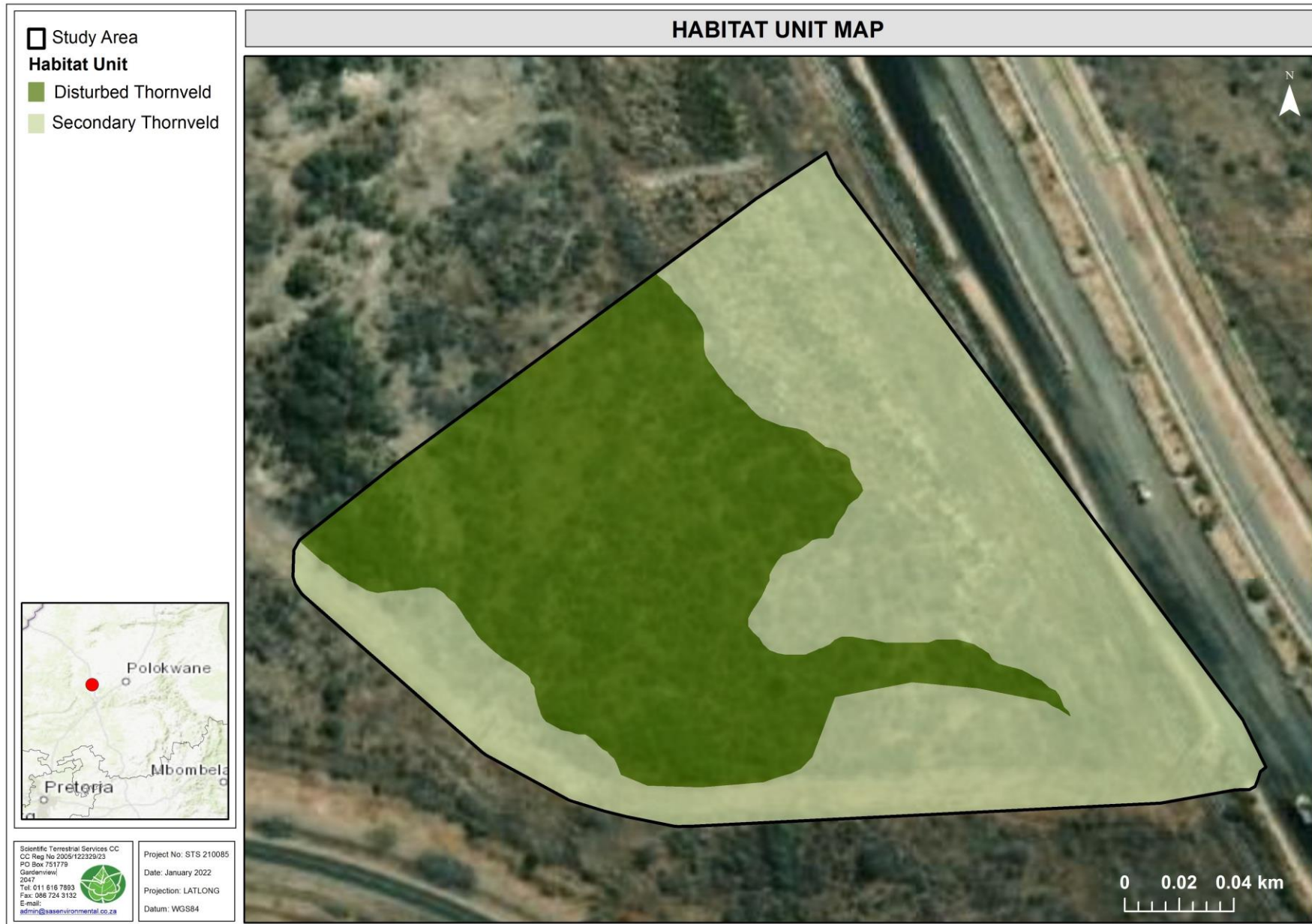


Figure 8: Map illustrating the habitat units associated with the study area on a macroscale.



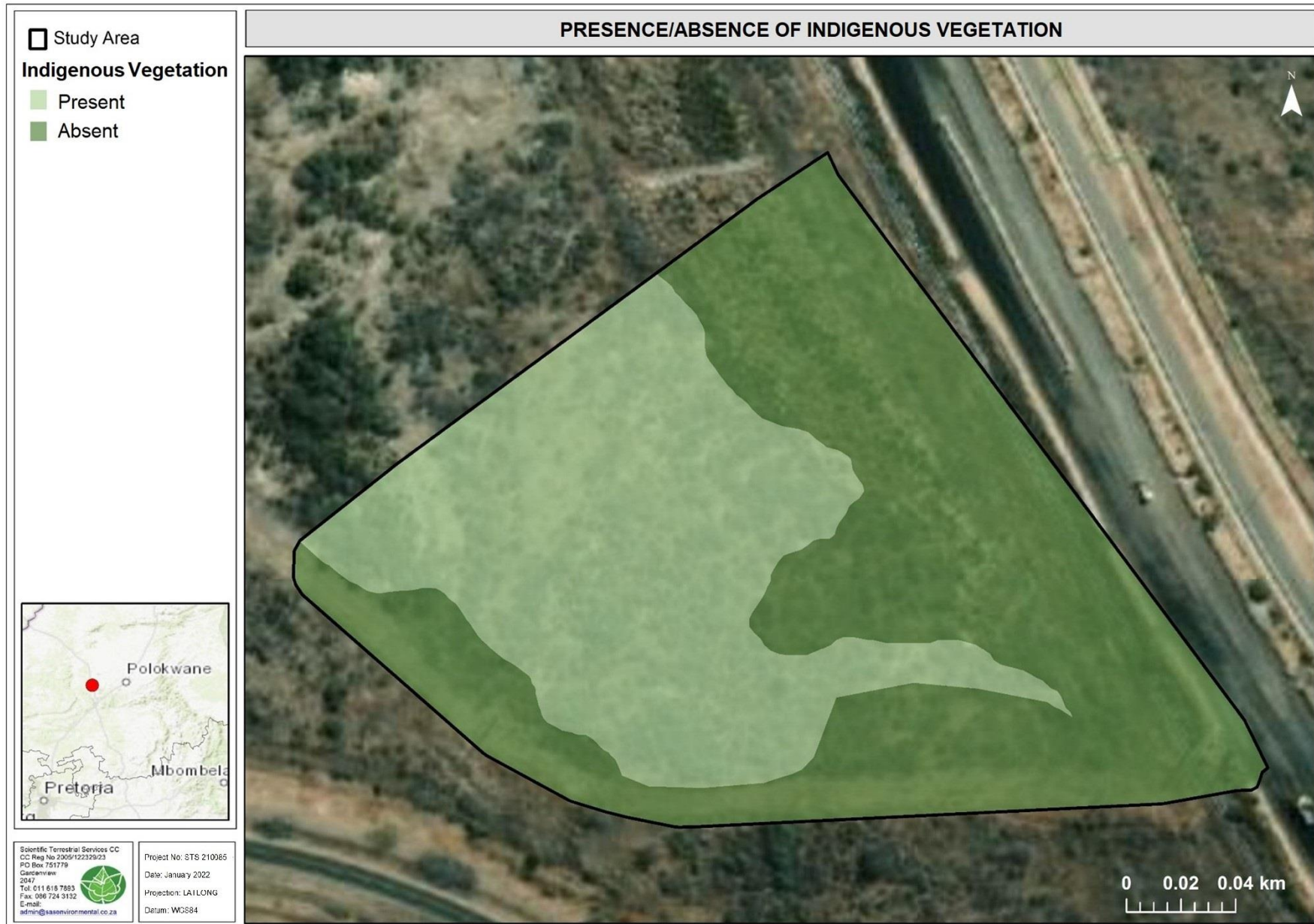


Figure 9: Map illustrating the habitat units associated with indigenous vegetation within the study area on a macroscale.





## 4.5 Floral Assessment Results

### HABITAT OVERVIEW

Overall, the study area supported an intermediate species diversity. The two broad habitat units identified within the study area is discussed in more detail below, with representative photographs presented below for a visual representation of the habitat units and examples of species recorded within these habitats. Refer to Appendix F for a list of species recorded in these habitat units.

**Disturbed Thornveld Habitat** – This habitat unit comprises the smallest extent of the study area (approximately 2 ha) and was characterised by a semi-open to closed woody layer with small, scattered areas that had a slightly rockier affinity. The Disturbed Thornveld habitat has not been impacted directly by anthropogenic activities or mining expansion and thus **conforms to the definition of indigenous vegetation** (as floral communities have not been significantly transformed within the last decade). However, the habitat is surrounded by infrastructure servitudes and historic mine expansion within the north-eastern, western, and southern boundaries of the study area. This has resulted in several edge effects impacting on habitat conditions, e.g., alien and invasive plant (AIP) proliferation. At present, the habitat is associated with indigenous encroachment, particularly by *Dichrostachys cinerea* and several *Aloe* species, further serving as an indication of poor veld conditions and an alteration in natural ecological drivers such as herbivory and fire regimes. The current and historic association with disturbances has therefore resulted in degraded floral communities that are markedly less diverse than that of the surrounding natural habitat. Although the habitat unit provides habitat for indigenous vegetation, the alteration in fire and herbivory regimes and the residual impacts from nearby historic activities (e.g., mining activities etc), have resulted in a habitat that is no longer being considered representative of the reference vegetation type, i.e., the Makhado Sweet Bushveld.

**Secondary Thornveld Habitat** – this habitat unit (the largest habitat within the study area, approximately 2.6 ha) was largely associated with historic stockpiles (see below image (d)) and therefore a high association with disturbance (reflected in the floral communities by the presence of AIPs and encroaching indigenous vegetation). Generally, this habitat unit was characterised by a poorly developed forb layer which mainly comprised alien weeds. These historically transformed sections have not yet been rehabilitated. The resultant habitat is thus uneven and dominated by indigenous encroaching woody species as well as several listed AIP species. Given the level of transformation and the subsequent impacts to the vegetation associated with this habitat unit that occurred within the last decade, the current vegetation within the habitat **does not meet the definition of indigenous vegetation** as per NEMA Listing Notices. Furthermore, an alteration in species composition and vegetation structure has resulted within the current vegetation communities and as such, the Secondary Thornveld Habitat is no longer considered representative of the reference vegetation type.

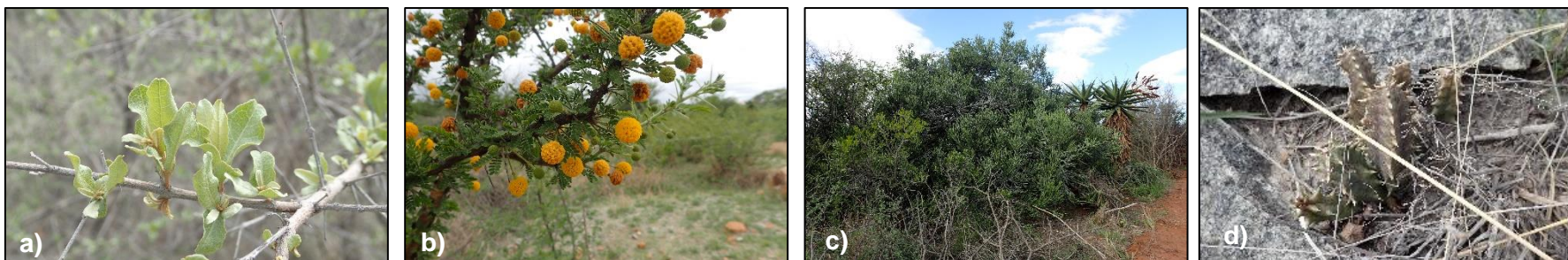


Photographs illustrating the landscape associated with the Disturbed Thornveld Habitat Unit: a-b) typical landscape (with encroaching species (including *Dichrostachys cinerea* and *Aloe* species) in the background) associated with the habitat unit, and c) woody encroachment by *Dichrostachys cinerea* is evident in parts of the habitat.

HABITAT OVERVIEW



Photographs illustrating the landscape associated with the Secondary Thornveld Habitat: a-b) typical areas in which berms have been created and where historic stockpiles have not been rehabilitated. Significant woody encroachment is evident within much of this habitat unit. Photo c) illustrates surrounding servitude areas which serve as a source of disturbance and result in edge effect impacts, with d) illustrating the historically transformed areas (2013).



Photographs of plant species recorded within the study area: a) *Combretum imberbe* (a NFA woody species recorded within the Disturbed Thornveld Habitat), b) *Vachellia permixta* (an infrequently recorded woody species recorded within the Disturbed Thornveld Habitat), c) *Euphorbia tirucalli* (in the left) and *Aloe marlothii* (in the right; succulent species recorded within the Secondary Thornveld), and d) *Huernia species* (a LEMA protected species recorded within the Disturbed Thornveld Habitat).

VEGETATION STRUCTURE

| Disturbed Thornveld Habitat  | Secondary Thornveld Habitat  |
|--|--|
| <p><b>Short to medium height, semi-open to closed woodland</b> (as per Figure C1 in Appendix C) characterised by a higher species richness than the Secondary Thornveld Habitat. Woody encroachment was evident within this habitat unit.</p> <p>Overall, the structure and species composition of this habitat is no longer considered representative of the reference vegetation type.</p> | <p><b>Short, semi-open to closed woodland</b> (as per Figure C1 in Appendix C) characterised by a poor species diversity and the presence of significant woody encroachment throughout.</p> <p>Overall, the structure and species composition of this habitat is no longer considered representative of the reference vegetation type.</p> |



### SPECIES OF CONSERVATION CONCERN

In terms of Section 56 of the NEMBA, threatened species are Red Data Listed (RDL) species falling into the CR, EN, VU or Protected (P) categories of ecological status. During the November 2021 field assessment, no RDL species were recorded within the study area. The National Web-based Environmental Screening Tool indicated that the study area is in an area of **low sensitivity** from a Plant Species Theme perspective. Given that RDL species were not recorded within the study area and are unlikely to be located within the study area, the low sensitivity as denoted by the screening tool was supported for the Plant Species Theme.

The LEMA provides a list of Specially Protected Species (Schedule 11) and Protected Species (Schedule 12) for the Limpopo Province. These species were also considered as part of the SCC assessment for the study area because they are considered important provincially. Provincially protected species recorded and the Probability of Occurrence (POC) calculations for LEMA protected species are presented below for the habitat units:

- Disturbed Thornveld Habitat:
  - **Huernia sp. (POC = Confirmed);** *Duvalia polita* (POC = High, Status = LC); *Stapellia* sp. (POC = High); and *Scadoxus* sp. (POC = Medium).
- Secondary Thornveld Habitat:
  - *Huernia* sp. (POC = High); and *Stapellia* sp. (POC = High).

Additionally, several protected tree species, as per the NFA, were included in the SCC assessment and several species were observed within the Habitat unit/s. The POC calculations for these species are presented below:

- Disturbed Thornveld Habitat:
  - ***Sclerocarya birrea* subsp. *caffra* (POC = Confirmed; Status = LC);** ***Combretum imberbe* (POC = Confirmed; Status = LC);** *Elaeodendron transvaalense* (POC = Medium; Status = NT); and *Boscia albitrunca* (POC = Medium; Status = LC).
- Secondary Thornveld Habitat:
  - ***Sclerocarya birrea* subsp. *caffra* (POC = Confirmed; Status = LC);** *Combretum imberbe* (POC = Medium; Status = LC).

The TOPS List as per the 2007 Regulations provides a list of protected species for the Limpopo Province. Suitable habitat to support TOPS species was identified within the study area for the following:

- Disturbed & Secondary Thornveld Habitat:
  - *Harpagophytum zeyheri* subsp. *zeyheri* (POC = Medium, Status = LC).

Permits from the Limpopo Department of Economic Development, Environment & Tourism (LEDET) and authorisation from the Department of Forestry, Fisheries, and the Environment (DFFE) should be obtained to remove, cut, or destroy any of the above-mentioned protected and/or threatened species before any vegetation clearing may take place.

Refer to **Appendix G** for the complete SCC assessment results.



**PRESENCE OF UNIQUE LANDSCAPES**

The Terrestrial Sensitivity for the entire study area is considered to have a **very high sensitivity**. The triggered sensitivity feature included the presence of an ESA1. However, the Disturbed Thornveld and the Secondary Thornveld Habitats has been significantly impacted by anthropogenic influences and edge effects. As such ESA habitat and associated connective corridors across the study area and surrounding area, was not confirmed for the study area. The high sensitivity as denoted by the Screening Tool was thus not confirmed.

**PRESENCE OF INDIGENOUS VEGETATION**

The extent of the study area is larger than 1 ha, but smaller than 20 ha, and thus can potentially trigger Activity 27 of Listing Notice 1. Furthermore, the study area is larger than 300 m<sup>2</sup>, and thus can potentially trigger Activity 12 of Listing Notice 3. However, based on the ground-truthed results of the field assessment together with digital satellite imagery from the past ten years, the field verification indicated that the Secondary Thornveld Habitat did not contain indigenous vegetation. However, the Disturbed Thornveld Habitat did support indigenous vegetation.

**CONCLUDING REMARKS**

From a floral perspective, the Disturbed Thornveld Habitat is deemed to be of moderately low ecological importance and the Secondary Thornveld Habitat is deemed to be of a low ecological importance within the greater landscape (refer also to section 5).

## Key considerations:

- The reference vegetation type was identified as the **Makhado Sweet Bushveld**. Given the overall degraded and modified nature of the habitats within the study area, as well as the alteration of natural fire regimes and grazing pressure experienced within the habitat, none of the habitat units are considered representative of the reference vegetation type.
- Both the Secondary Thornveld Habitat and the Disturbed Thornveld Habitat provide suitable habitat to sustain viable populations of several floral SCC; nationally protected (i.e., NFA) species were recorded within both habitat units and provincially protected species, as per the LEMA, were recorded within the Disturbed Thornveld Habitat. Suitable habitat to support other SCC (e.g., TOPS species) is potentially available within both the Disturbed and the Secondary Thornveld Habitat. The study area does not provide habitat to sustain populations of RDL species. If the construction of the proposed cable repair workshop area is authorised, a summer season walkdown of the footprint area is recommended in which all SCC are recorded and marked for permit application purposes (be it for rescue and relocation initiatives, or destruction of the specimens). All SCC species recorded during the recommended footprint walkdown should first be investigated for possible relocation to suitable habitat outside the direct footprint (as far as is feasible) – destruction of SCC should only be considered as a last resort. Good record-keeping will be necessary to record this process and to document all successes and failures associated with the relocation. Rescue and relocation should be done by a suitably qualified specialist. Any additional floral SCC encountered during the construction phase of the proposed project should also be relocated by a suitably qualified specialist and the necessary permits should be applied for. Permits required for the relocation or destruction/removal of SCC prior to vegetation clearing must be obtained by the relevant authorities, i.e., from the LEDET and/or the DFFE.

In terms of the National Web-based Environmental Screening Tool outcome, the study area (and its associated habitat units) matches the low sensitivity assigned to the Plant Species Theme, especially as no suitable habitat to support a RDL species was recorded during the field assessment. The triggered sensitivity feature included the presence of an ESA1. However, the Disturbed Thornveld and the Secondary Thornveld Habitats has been significantly impacted by anthropogenic influences and edge effects. As such ESA habitat and associated connective corridors across the study area and surrounding area, was not recorded for the study area. The high sensitivity as denoted by the Screening Tool was thus not confirmed.

- Due to the entire study area already being exposed to continued disturbance (e.g., continued grazing) and edge effect impacts, both habitat units are susceptible to AIP proliferation and continued bush encroachment. Care must be taken to limit edge effects on the surrounding natural areas. Furthermore, it is recommended that an AIP species management plan and a bush encroachment control plan be developed to manage the proliferation of AIPs within the study area.
- All the natural areas outside of the authorised footprint must be demarcated as “no-go” areas to ensure no footprint creep takes place.



## 4.6 Alien and Invasive Plant (AIP) Species

South Africa is home to an estimated 759 naturalised or invasive terrestrial plant species (Richardson et al., 2020), with 327 plant species, most of which are invasive, listed in national legislation<sup>10</sup>. Many introduced species are beneficial, e.g., almost all agriculture and forestry production are based on alien species, with alien species also widely used in industries such as horticulture. However, some of these species manage to “escape” from their original locations, spread and become invasive. Although only a small proportion of introduced species become invasive (~0.1–10%), those that do proceed to impact negatively on biodiversity and the services that South Africa’s diverse natural ecosystems provide (from ecotourism to harvesting food, cut flowers, and medicinal products) (van Wilgen and Wilson, 2018).

### 4.6.1 Legal Context

South Africa has released several articles of legislation that are applicable to the control of alien species. Currently, invasive species are controlled by the NEMBA – Alien and Invasive Species Regulations, 2020, in Government Gazette 43735 dated 25 October 2020. AIP species defined in terms of NEMBA are assigned a category and listed within the NEMBA List of Alien and Invasive Species (2020) in accordance with Section 70(1)(a) of the NEMBA:

- **Category 1a** species are those targeted for urgent national eradication;
- **Category 1b** species must be controlled as part of a national management programme, and cannot be traded or otherwise allowed to spread;
- **Category 2** species are the same as category 1b species, except that permits can be issued for their usage (e.g., invasive tree species can still be used in commercial forestry, providing a permit is issued that specifies where they may be grown and that permit holders “*Unless otherwise specified in the Notice, any species listed as a Category 2 Listed Invasive Species that occurs outside the specified area contemplated in sub-regulation (1), must, for purposes of these regulations, be considered to be a Category 1b Listed Invasive Species and must be managed according to Regulation 3*”); and
- **Category 3** are listed invasive species that can be kept without permits, although they may not be traded or further propagated, and must be considered a Category 1b species if they occur in riparian zones.

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<sup>10</sup> Government Notice number 1003: Alien and Invasive Species Lists, 2020, in Government Gazette 43726 dated 18 October 2020, as it relates to the National Environmental Management Biodiversity Act, 2004 (Act No 10 of 2004).



Duty of care related to listed invasive species are referred to in NEMBA Section 73<sup>11</sup>. The motivation for this duty of care is both environmentally and economically driven. Management of alien species in South Africa is estimated to cost at least ZAR 2 billion (US\$142 million) each year - this being the amount currently spent by the national government's DFFE - i.e., the Working for Water programme (van Wilgen, 2020). Managing AIPs early on will reduce clearing costs in the long run.

#### 4.6.2 Site Results

A total of nine AIP species were recorded within the study area. The density of AIPs within the study area varied; overall the Heavily Degraded Habitat supported higher density of AIPs.

Of the nine AIP species recorded within the study area, three species are listed under NEMBA category 1b, and one species is listed as NEMBA category 2. The remaining five species are not currently listed in the NEMBA Alien and Invasive Species List of 2020 and thus are not regarded as invasive species. However, several of these species are rather seen as problem plants, especially *Bidens Pilosa*, *Tagetes minuta*, and *Schkuhria pinnata*. Although these species may not pose an immediate risk of displacing native flora, they can become problematic after disturbance events and due to their pioneering nature, will colonise disturbed habitat more readily than native flora.

It is recommended that the study area be targeted for AIP control, especially during construction activities (if authorised), to prevent the spread of AIP propagules into surrounding areas. Refer to table 2 for more details on the AIPs recorded within the study area

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<sup>11</sup> Section 73(2): A person who is the owner of land on which a listed invasive species occurs must-

- a) notify any relevant competent authority, in writing, of the listed invasive species occurring on that land;
- b) take steps to control and eradicate the listed invasive species and to prevent it from spreading; and
- c) take all the required steps to prevent or minimise harm to biodiversity.



**Table 2: Alien and invasive plant species associated with the study area.**

| Scientific Name               | Common Name              | Origin                  | NEMBA Category | Secondary Thornveld | Disturbed Thornveld |
|-------------------------------|--------------------------|-------------------------|----------------|---------------------|---------------------|
| <b>Woody Species</b>          |                          |                         |                |                     |                     |
| <i>Plumeria rubra</i>         | Frangipani               | Central America         | NL             | x                   | x                   |
| <i>Tecoma stans</i>           | Yellow bells             | Mexico & Southern USA   | 1b             |                     | x                   |
| <b>Herbaceous Species</b>     |                          |                         |                |                     |                     |
| <i>Bidens pilosa</i>          | Blackjack                | South & Central America | NL             | x                   | x                   |
| <i>Gomphrena celosioides</i>  | Bachelor's Button        | South America           | NL             |                     | x                   |
| <i>Schkuhria pinnata</i>      | Dwarf Mexican Marigold   | Central America         | NL             | x                   | x                   |
| <i>Solanum elaeagnifolium</i> | Silver-leaf bitter apple | Southern USA            | 1b             | x                   | x                   |
| <i>Tagetes minuta</i>         | Kaki bos                 | South & Central America | NL             | x                   | x                   |
| <b>Succulent Species</b>      |                          |                         |                |                     |                     |
| <i>Agave sisalana</i>         | Sisal                    | Central America         | 2              | x                   | x                   |
| <b>Graminoid Species</b>      |                          |                         |                |                     |                     |
| <i>Pennisetum setaceum</i>    | Fountain grass           | East Africa             | 1b             |                     | x                   |

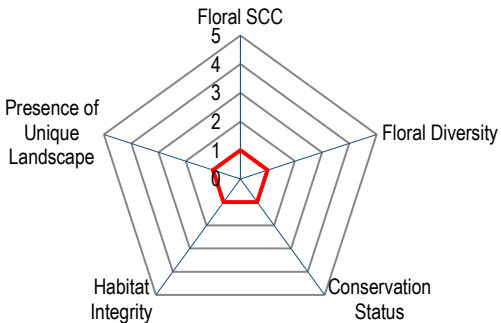
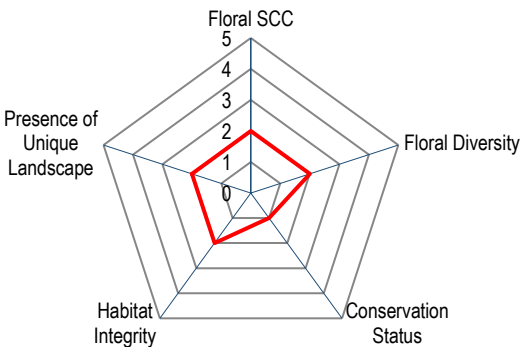
## 5. SENSITIVITY MAPPING

The Screening Tool identified the study area to be in a **low sensitivity** area for the Plant Species Theme and a **very high sensitivity** area for the Terrestrial Biodiversity Theme. Based on the *ground-truthed* results of the site visit, Table 3 below presents the sensitivity of each identified habitat unit for flora along with an associated conservation objective and implications for development.

Figure 10 conceptually illustrate areas of ecological sensitivity – depicting the sensitivity of the flora communities within the study area. The study area is depicted according to its sensitivity in terms of the presence or potential for SCC, habitat integrity and levels of disturbance, threat status of the habitat type, the presence of unique landscapes and overall levels of diversity.



**Table 3: A summary of the floral sensitivity of each habitat unit and implications for development.**

| Habitat Sensitivity   | Conservation objective   | Habitat Unit                                   | Key habitat characteristics   |
|---|--|--|---|
| <p style="text-align: center;"><b>Low</b></p>              | <p>Optimise development potential.</p>   | <p><b>Secondary Thornveld Habitat Unit</b></p> | <ul style="list-style-type: none"> <li>- Indigenous vegetation as per NEMA absent.</li> <li>- Habitat has been degraded due to current and historic disturbances (e.g., vegetation clearing and unrehabilitated sites).</li> <li>- High association with anthropogenic activities.</li> <li>- Only one NFA tree was recorded within this habitat unit and in low densities. No other Floral SCC (e.g., RDL species, TOPS, or LEMA protected species) were recorded or are anticipated to be present.</li> <li>- No significant biodiversity features present.</li> </ul>  |
| <p style="text-align: center;"><b>Moderately low</b></p>  | <p>Optimise development potential while improving biodiversity integrity of surrounding natural habitat and managing edge effects.</p> | <p><b>Disturbed Thornveld Habitat</b></p>      | <ul style="list-style-type: none"> <li>- Indigenous vegetation presents.</li> <li>- Habitat has been disturbed due to current and historic disturbances (e.g., AIP proliferation); floral communities have shifted away from the reference vegetation type. Floral species diversity is moderately low.</li> <li>- Two NFA protected tree species (of which one species is a RDL species) were recorded within the habitat unit. Habitat to support other SCC (i.e., as per the LEMA and TOPS) is deemed possible, albeit moderately low. The habitat is not considered able to support viable populations of RDL species in its current degraded condition.</li> <li>- The Disturbed Thornveld and the Secondary Thornveld Habitats has been significantly impacted by anthropogenic influences and edge effects. As such ESA habitat and associated connective corridors across the study area and surrounding area, was not confirmed for the study area.</li> </ul> |





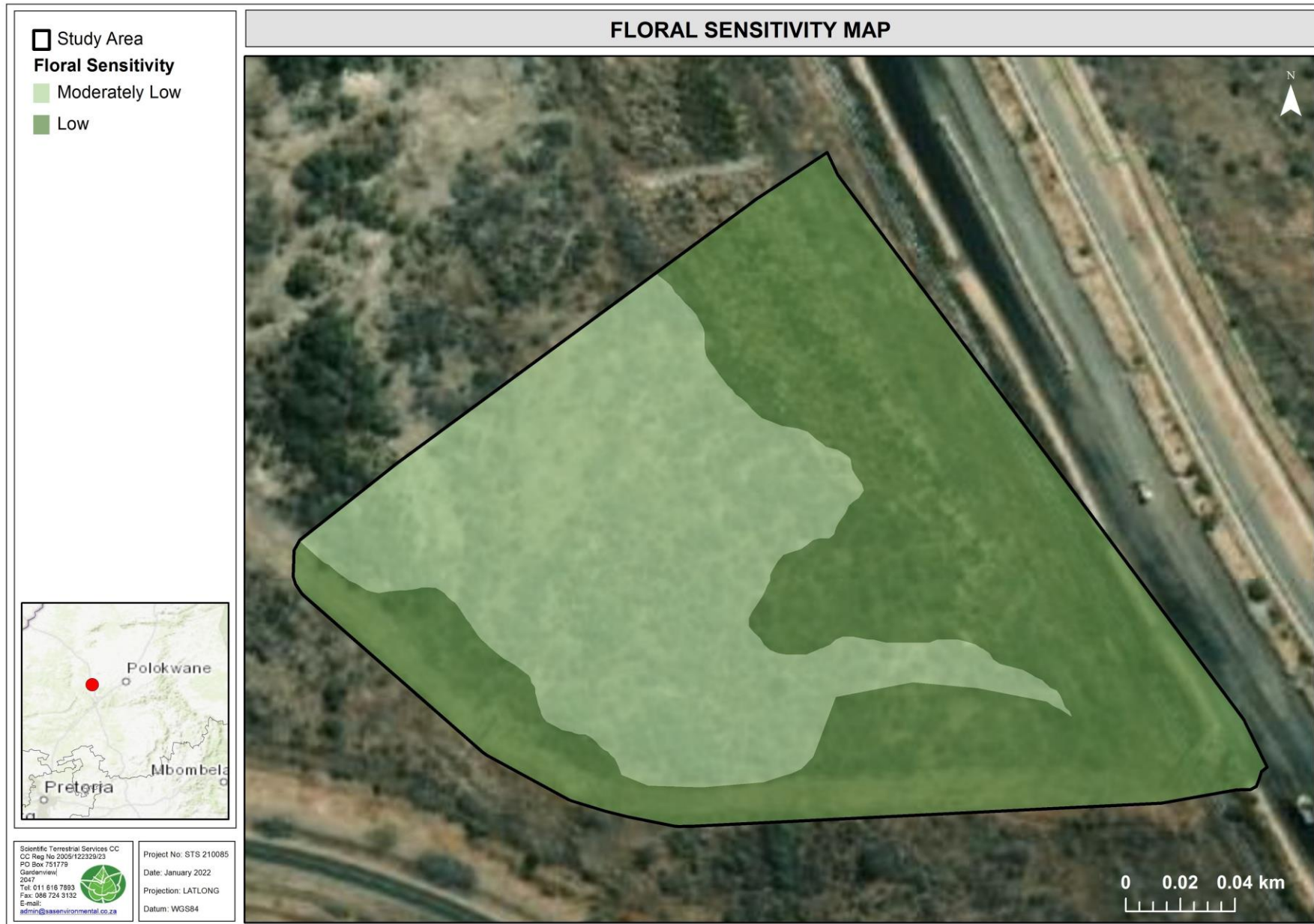


Figure 10: Map illustrating the floral sensitivity associated with the study area, on a macroscale.



## 6. IMPACT ASSESSMENT

Table 4 below serves to summarise the significance of perceived impacts on the floral ecology of the study area, according to the method provided by the proponent (as is described in Appendix D).

An impact assessment (6.1) and discussion (6.2) of all i) Pre-construction & Planning, ii) Mining (i.e., Construction & Operational Phase), and iii) Decommissioning & Rehabilitation Phase impacts are provided in the sections below. All mitigatory measures required to minimise the perceived impacts are presented within the impact assessment tables (as presented in Section 6.1).

### 6.1 *Impact Assessment Tables*

The below section provides the findings of the impact assessment undertaken with reference to the perceived impacts on the associated floral ecology within the study area prior to the implementation of mitigation measures and following the implementation of mitigation measures. The mitigated results of the impact assessment have been calculated on the premise that all mitigation measures as stipulated in this report are adhered to and implemented (provided in impact tables below). Should such actions not be adhered to, it is highly likely that post-mitigation impact scores will increase.

The table below (Table 4) provides the results of the floral ecology impact assessment.



**Table 4: Summary of the Impact Assessment of the i) Pre-Construction & Planning, ii) Construction & Operational (i.e., Mining Phase), and iii) Decommissioning & Rehabilitation Phases of the proposed construction of the cable repair workshop area.**

| Nature of the impact   | Significance of potential impact <b>BEFORE</b> mitigation |   |   |   |     |              | Mitigation Measures | Significance of potential impact <b>AFTER</b> mitigation |   |   |   |     |              | Degree of mitigation (%) |    |     |      |
|--|---|---|---|---|-----|--------------|---------------------|--|---|---|---|-----|--------------|--------------------------|----|-----|------|
|  | P   | D | E | M | LoR | Significance |                     | P  | D   | E | M | LoR | Significance |                          |    |     |      |
| <b>ACTIVITY: Cable Repair Workshop Area Development</b>  |   |   |   |   |     |              |                     |  |   |   |   |     |              |                          |    |     |      |
| <b>Pre-Construction &amp; Planning Phase</b>   |   |   |   |   |     |              |                     |  |   |   |   |     |              |                          |    |     |      |
| Potential failure to conduct a walkdown of the authorised footprint area before construction activities commence where floral SCC, where present, are marked and relocated to suitable habitat outside the development footprint <b>prior</b> to the construction phase. | -   | 4 | 2 | 2 | 6   | 2            | 40                  | Moderate   | * If SCC, that are not RDL species are encountered and will be affected by the construction activities, these species must, as far as is possible, be relocated to suitable habitat surrounding the disturbance footprint. If RDL species are encountered, avoidance is the best mitigation.<br>* Permits will be required from LEDET for protected species that need to be removed, cut, or destroyed before any vegetation clearing may take place. | 3 | 1 | 1   | 4            | 1                        | 18 | Low | 55,0 |



| Nature of the impact  | Significance of potential impact <b>BEFORE</b> mitigation |   |   |   |     |              | Mitigation Measures | Significance of potential impact <b>AFTER</b> mitigation |   |   |   |     |              | Degree of mitigation (%) |    |     |      |
|---|---|---|---|---|-----|--------------|---------------------|--|---|---|---|-----|--------------|--------------------------|----|-----|------|
|   | P   | D | E | M | LoR | Significance |                     | P  | D   | E | M | LoR | Significance |                          |    |     |      |
| <b>ACTIVITY: Cable Repair Workshop Area Development</b>   |   |   |   |   |     |              |                     |  |   |   |   |     |              |                          |    |     |      |
| <p>Potential failure to comply with national and regional legislative requirements regarding permit applications, including timeously liaising with national and provincial competent authorities, for the removal / destruction of species listed under:</p> <ul style="list-style-type: none"> <li>- The list of Schedule 12 (Protected plants) under the Limpopo Environmental Management Act, 2003 (Act 7 of 2003) (LEMA);</li> <li>- The List of Protected Tree Species (GN 536 OF 2018) as it relates to the National Forest Act (Act 84 of 1998) (NFA); and</li> <li>- The NEMBA Threatened or Protected Species (TOPS) list (Government Gazette [GN] 29657, as amended in GN R1187 in Government Gazette 30568 of 2007 and again in GN 627 in Government Gazette 43386 of 2020).</li> </ul> <p>This will result in unnecessary or unlawful destruction/removal of floral SCC leading to a decline in the numbers of NFA-Protected Tree species (particularly <i>Sclerocarya birrea</i> subsp. <i>caffra</i> and <i>Combretum imberbe</i>) and/or potential TOPS-Protected floral species.</p> | -   | 4 | 2 | 2 | 6   | 2            | 40                  | Moderate   | <p>* Before any construction activities can occur, a detailed walk down of the area must take place, during which all NFA-protected tree species should be marked and permits applied for to remove / cut / destroy these species.</p> <p>* Permits from the relevant authorities, i.e., Limpopo Department of Economic Development and Tourism (LEDET) and Department of Forestry, Fisheries, and the Environment (DFFE) should be obtained before removal, cutting or destruction of protected species or TOPS species before any proposed vegetation clearing activities may take place.</p> | 3 | 1 | 1   | 4            | 1                        | 18 | Low | 55,0 |



| Nature of the impact   | Significance of potential impact <b>BEFORE</b> mitigation |   |   |   |     |              | Mitigation Measures | Significance of potential impact <b>AFTER</b> mitigation |  |   |   |     |              | Degree of mitigation (%) |    |     |      |
|--|---|---|---|---|-----|--------------|---------------------|--|--|---|---|-----|--------------|--------------------------|----|-----|------|
|  | P   | D | E | M | LoR | Significance |                     | P  | D  | E | M | LoR | Significance |                          |    |     |      |
| <b>ACTIVITY: Cable Repair Workshop Area Development</b>  |   |   |   |   |     |              |                     |  |  |   |   |     |              |                          |    |     |      |
| <i>Inconsiderate planning of infrastructure placement and design, leading to the loss of intact floral habitat, as well as unnecessary edge effect impacts (e.g., ongoing alien vegetation spread and bush encroachment) within areas outside of the proposed development footprint.</i> | -   | 4 | 3 | 2 | 6   | 2            | 44                  | Moderate   | * Planned footprint area must be optimised, ensuring that the layout is as small as possible and does not encroach upon any neighbouring floral communities.<br>* Minimise loss of indigenous vegetation (e.g., especially within surrounding areas) where possible through adequate planning and, where necessary, by incorporating the sensitivity of the biodiversity report as well as other specialist studies. Where vegetation can form part of landscaping, larger trees and/or rocky areas (e.g., where Huernias are located should be incorporated).<br>* Design of infrastructure should be environmentally sound, and all possible precautions taken to prevent potential spills and /or leaks. All spills and /or leaks from equipment must be immediately remedied and cleaned up to ensure that these chemicals do not enter the soils. | 3 | 2 | 1   | 4            | 1                        | 21 | Low | 52,3 |
| <i>Potential failure to draft an updated AIP Management/Control plan for the development footprint area before the commencement of construction activities.</i>  | -   | 4 | 3 | 2 | 8   | 2            | 52                  | Moderate   | * Prior to the commencement of construction activities on site, the existing alien and invasive plant control plan for the mine should be updated and implemented throughout all phases of the proposed cable repair workshop project.<br>i) Cleared vegetation and removed soil that will not be used again (e.g., in rehabilitation) should be disposed of at a registered waste facility where alien propagules will not spread further into natural habitat; and<br>ii) It is highly recommended that the AIP Management/ Control Plan should be implemented by an experienced professional.<br>* Only registered chemicals may be used during any carried out chemical control of AIPs.   | 3 | 2 | 1   | 6            | 1                        | 27 | Low | 48,1 |



| Nature of the impact  | Significance of potential impact <b>BEFORE</b> mitigation |   |   |   |     |              | Mitigation Measures | Significance of potential impact <b>AFTER</b> mitigation |  |   |   |     |              | Degree of mitigation (%) |    |     |      |
|---|---|---|---|---|-----|--------------|---------------------|--|--|---|---|-----|--------------|--------------------------|----|-----|------|
|   | P   | D | E | M | LoR | Significance |                     | P  | D  | E | M | LoR | Significance |                          |    |     |      |
| <b>ACTIVITY: Cable Repair Workshop Area Development</b>   |   |   |   |   |     |              |                     |  |  |   |   |     |              |                          |    |     |      |
| <p>Potential failure to draw up and get approval for the required plans to mitigate impacts before and at the commencement of construction activities:</p> <ul style="list-style-type: none"> <li>- Failure to draw up and get approval for an Erosion Control Plan;</li> <li>- Failure to draw up and get approval for a Rehabilitation Plan to be implemented before the commencement of construction.</li> </ul> <p>This will result in:</p> <ul style="list-style-type: none"> <li>- Extensive and unnecessary loss of floral habitat, leading to a decline in floral diversity, including a decline in floral SCC numbers within the study area, including species such as <i>Sclerocarya birrea</i> subsp. <i>caffra</i> and <i>Combretum imberbe</i>).</li> <li>- Inability of vegetation to recover due to a lack of, or untimely, implementation of a well-conceived rehabilitation plan.</li> </ul> | -   | 4 | 3 | 2 | 8   | 2            | 52                  | Moderate   | <p>* Ensure that sound environmental management is in place during the planning phase.</p> <p>* Prior to the commencement of construction activities, the entire development footprint area, should be fenced off and clearly demarcated.</p> <p>* Prior to the commencement of construction activities on site, a rehabilitation plan should be developed for implementation throughout the cable repair workshop development phases (accommodating concurrent rehabilitation).</p> | 3 | 2 | 1   | 6            | 1                        | 27 | Low | 48,1 |
| <b>Construction &amp; Operational Phase</b>   |   |   |   |   |     |              |                     |  |  |   |   |     |              |                          |    |     |      |



| Nature of the impact  | Significance of potential impact <b>BEFORE</b> mitigation |   |   |   |     |              | Mitigation Measures | Significance of potential impact <b>AFTER</b> mitigation |  |   |   |     |              | Degree of mitigation (%) |    |     |      |
|---|---|---|---|---|-----|--------------|---------------------|--|--|---|---|-----|--------------|--------------------------|----|-----|------|
|   | P   | D | E | M | LoR | Significance |                     | P  | D  | E | M | LoR | Significance |                          |    |     |      |
| <b>ACTIVITY: Cable Repair Workshop Area Development</b>   |   |   |   |   |     |              |                     |  |  |   |   |     |              |                          |    |     |      |
| <p>Loss of floral diversity and habitat due to construction activities and vegetation clearing;<br/>                     i) Dumping of construction material within areas where no construction is planned;<br/>                     ii) Proliferation of alien invasive species within the footprint area due to construction activities, spreading into the surrounding areas.</p> <p>This could lead to the potential loss of floral species within surrounding habitat areas.</p> | -   | 4 | 3 | 3 | 6   | 3            | 48                  | Moderate   | <p>* The construction footprint must be kept as small as possible to minimise the impact on the surrounding environment (edge effect management).<br/>                     * Removal of vegetation must be restricted to what is necessary and should remain within the approved development footprint.<br/>                     * If any spills occur, they should be immediately cleaned up to avoid soil contamination that can hinder floral rehabilitation later down the line. Spill kits should be kept on-site within workshops. In the event of a breakdown, maintenance of vehicles must take place with care, and the recollection of spillage should be practised, preventing the ingress of hydrocarbons into the topsoil.<br/>                     * An AIP control plan must be implemented for areas cleared outside of the authorised footprint area.</p> | 3 | 2 | 2   | 4            | 1                        | 24 | Low | 50,0 |



| Nature of the impact   | Significance of potential impact <b>BEFORE</b> mitigation |   |   |   |     |              | Mitigation Measures | Significance of potential impact <b>AFTER</b> mitigation |   |   |   |     |              | Degree of mitigation (%) |    |     |      |
|--|---|---|---|---|-----|--------------|---------------------|--|---|---|---|-----|--------------|--------------------------|----|-----|------|
|  | P   | D | E | M | LoR | Significance |                     | P  | D   | E | M | LoR | Significance |                          |    |     |      |
| <b>ACTIVITY: Cable Repair Workshop Area Development</b>  |   |   |   |   |     |              |                     |  |   |   |   |     |              |                          |    |     |      |
| <p>Loss of floral diversity and habitat due to potentially poorly managed edge effects such as</p> <p>i) Ineffective rehabilitation of compacted areas, bare soils, or eroded areas leading to ongoing proliferation of AIP species in disturbed areas and subsequent spread to surrounding natural areas altering the floral habitat;</p> <p>ii) Compaction of soils outside of the study area due to indiscriminate driving of construction vehicles through natural vegetation; and</p> <p>iii) Habitat fragmentation because of construction activities leading to loss of floral diversity.</p> | -   | 4 | 2 | 3 | 8   | 3            | 52                  | Moderate   | <p>* Clearing of vegetation should take place in a phased manner as to keep bare soil areas as small as possible to limit the erosion potential. Additionally, construction personnel and construction vehicles should be kept to the bare minimal per site to reduce the construction footprint and potential of soil compaction.</p> <p>* Vehicles should be restricted to travelling only on designated roadways to limit the ecological footprint of the construction activities. Additional road construction should be limited to what is absolutely necessary, and the footprint thereof kept to a minimal.</p> <p>* Care should be taken during the construction and operational phase of the proposed development to limit edge effects to surrounding natural habitat. At minimum, this can be achieved by:</p> <p>i) Demarcating all footprint areas during construction and operational activities;</p> <p>ii) No construction rubble or cleared alien invasive species are to be disposed of outside of demarcated areas, and should be taken to a registered waste disposal facility;</p> <p>iii) All soils compacted because of construction or operational activities should be ripped and profiled and reseeded;</p> <p>iv) Manage the spread of AIP species, which may affect remaining natural habitat within surrounding areas. Any areas that have been left bare because of the construction and operational activities should be rehabilitated using indigenous species.</p> | 3 | 1 | 2   | 2            | 1                        | 15 | Low | 71,2 |





| Nature of the impact  | Significance of potential impact <b>BEFORE</b> mitigation |   |   |   |     |              | Mitigation Measures | Significance of potential impact <b>AFTER</b> mitigation |   |   |   |     |              | Degree of mitigation (%) |    |     |      |
|---|---|---|---|---|-----|--------------|---------------------|--|---|---|---|-----|--------------|--------------------------|----|-----|------|
|   | P   | D | E | M | LoR | Significance |                     | P  | D   | E | M | LoR | Significance |                          |    |     |      |
| <b>ACTIVITY: Cable Repair Workshop Area Development</b>   |   |   |   |   |     |              |                     |  |   |   |   |     |              |                          |    |     |      |
| Loss of floral SCC from the study area for the following reasons:<br>i) Potential failure to monitor relocation success of occurring and potential occurring floral SCC (relocation must have taken place before construction phase); and<br>ii) Harvesting of floral SCC outside of the construction footprint by construction personnel.  | -   | 4 | 4 | 2 | 6   | 2            | 48                  | Moderate   | *No collection of indigenous floral species must be allowed by construction personnel, especially with regards to floral SCC (if encountered).<br>* Edge effect control needs to be implemented by fencing off or demarcating no-go areas to prevent further degradation and potential loss of floral SCC and their habitat outside of the proposed development footprint area. | 3 | 3 | 1   | 4            | 1                        | 24 | Low | 50,0 |
| Loss of floral diversity and habitat due to construction activities:<br>i) Destruction of vegetation due to unplanned fires;<br>ii) Dust generated during construction and operational activities accumulating on the surrounding floral individuals, altering the photosynthetic ability of plants, and potentially further decreasing optimal growing/re-establishing conditions. | -   | 3 | 3 | 3 | 6   | 2            | 36                  | Moderate   | * No illicit fires must be allowed during the construction of the proposed development.<br>* Where possible suppress dust to mitigate the impact of dust on flora within a close proximity of construction activities.  | 2 | 2 | 2   | 4            | 1                        | 16 | Low | 55,6 |
| <b>Decommissioning &amp; Rehabilitation Phase</b>   |   |   |   |   |     |              |                     |  |   |   |   |     |              |                          |    |     |      |



| Nature of the impact  | Significance of potential impact <b>BEFORE</b> mitigation |   |   |   |     |              | Mitigation Measures | Significance of potential impact <b>AFTER</b> mitigation |   |   |   |     |              | Degree of mitigation (%) |    |     |      |
|---|---|---|---|---|-----|--------------|---------------------|--|---|---|---|-----|--------------|--------------------------|----|-----|------|
|   | P   | D | E | M | LoR | Significance |                     | P  | D   | E | M | LoR | Significance |                          |    |     |      |
| <b>ACTIVITY: Cable Repair Workshop Area Development</b>   |   |   |   |   |     |              |                     |  |   |   |   |     |              |                          |    |     |      |
| Ineffective implementation of rehabilitation activities: Permanent loss of floral habitat, floral diversity, and floral SCC due to loss of favourable habitat to reinstate floral SCC. Higher likelihood of edge effect impacts on adjacent and nearby natural vegetation of increased sensitivity. | -   | 3 | 3 | 2 | 6   | 2            | 33                  | Moderate   | *All infrastructure footprints that will be decommissioned should be concurrently rehabilitated in accordance with a rehabilitation plan compiled by a suitable specialist.<br>* Regular dust suppression must be undertaken on bare soils during the closure and decommissioning phase.<br>* Storm water management measures should be maintained until rehabilitation is complete.<br>* All disturbed areas should be ripped to alleviate compaction.<br>*All rehabilitated areas should be rehabilitated to a point where natural processes will allow the ecological functioning and biodiversity of the area to be re-instated.<br>*Rehabilitation efforts must be implemented for a period of at least five years after decommissioning or until it is evident that veg has taken and can maintain self-sustained populations. A mix of indigenous grass seeds can be used during rehabilitation activities to re-establish a protective cover, to minimise soil erosion and dust emissions.<br>* Contractors will not be allowed to harvest any natural resources. | 2 | 2 | 1   | 4            | 1                        | 14 | Low | 57,6 |



| Nature of the impact   | Significance of potential impact <b>BEFORE</b> mitigation |   |   |   |     |              | Mitigation Measures | Significance of potential impact <b>AFTER</b> mitigation |  |   |   |     |              | Degree of mitigation (%) |    |     |      |
|--|---|---|---|---|-----|--------------|---------------------|--|--|---|---|-----|--------------|--------------------------|----|-----|------|
|  | P   | D | E | M | LoR | Significance |                     | P  | D  | E | M | LoR | Significance |                          |    |     |      |
| <b>ACTIVITY: Cable Repair Workshop Area Development</b>  |   |   |   |   |     |              |                     |  |  |   |   |     |              |                          |    |     |      |
| Potentially poorly implemented and monitored AIP Management programme, leading to the reintroduction and proliferation of AIP species within the area.<br>Potential failure to monitor rehabilitation. | -   | 4 | 3 | 2 | 8   | 3            | 52                  | Moderate   | *AIP control plans should be implemented to ensure continued control of AIP species within the study area and surrounding areas<br>* Follow up with alien and invasive plant control measures for a period of 5 years post-closure<br>*No dumping of litter must be allowed on-site. As such it is advised that vegetation cuttings be carefully collected and disposed of at a separate waste facility.<br>* Edge effect control needs to be implemented to prevent further degradation and potential loss of floral SCC or suitable habitat for such species outside of the proposed development footprint | 3 | 2 | 1   | 6            | 1                        | 27 | Low | 48,1 |
| Potential poor monitoring of relocated SCC resulting in the loss of SCC from the study area and poorly reinstated and represented floral SCC within rehabilitated areas.                               | -   | 4 | 3 | 2 | 6   | 2            | 44                  | Moderate   | * Monitoring of rescued and relocated floral SCC, particularly the NFA protected species recorded within the study area, should continue during the operational and maintenance phase until it is evident that the species have successfully established;<br>*As far as possible, no collection of floral SCC within the study area or adjacent natural habitat must be allowed during the any of the proposed phases of the development established.  | 3 | 2 | 1   | 4            | 1                        | 21 | Low | 52,3 |



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## **6.2 Impact Discussion**

The direct impact of the proposed construction of the cable repair workshop area on the floral ecology of the study area is not anticipated to be detrimental. Due to the already modified nature of the habitat units, particularly the Secondary Thornveld Habitat, the associated impacts are anticipated to remain localised – given that mitigation measures are adequately implemented.

The overall impact significance prior to the implementation of mitigation measures was medium. With the implementation of mitigation measures, the proposed impact significance for the study area and its associated habitat units was low.

### **6.2.1 Impact on Floral Ecology**

#### **Impact on Floral Habitat and Diversity**

The impact assessment was undertaken on all aspects of floral ecology deemed likely to be affected by the proposed construction of a cable repair workshop area. The proposed construction activities will result in the clearance of vegetation which will lead to a loss of floral habitat and diversity within the study area. Indigenous vegetation is likely to be impacted by the proposed activity within the Disturbed Thornveld. However, no indigenous vegetation will be directly impacted within the Secondary Thornveld Habitat. Edge effects across the study area should be managed and mitigated so to reduce impacts to the surrounding habitat which consists of indigenous vegetation.

The construction of the proposed cable repair workshop area within the Disturbed Thornveld Habitat unit (of moderately low sensitivity from a floral perspective) will result in the loss of the associated floral habitat. However, this habitat is largely disturbed in nature. As such a significant loss of the associated modified floral communities is not anticipated. The construction of the proposed cable repair workshop area is not likely to significantly impact floral communities at a larger local and regional (provincial) level.

The construction of the proposed cable repair workshop area within the Secondary Thornveld Habitat Unit (of low floral sensitivity), which is not associated with indigenous vegetation as per the NEMA listing notice definition, is not deemed likely to impact significantly on the floral habitat and diversity that is located within this habitat unit, nor is it likely to impact floral communities at a larger local and regional (provincial) level.



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Provided that strict mitigation measures are implemented, it is anticipated that the impact on floral habitat and diversity will be localised in extent and will not impact on floral conservation targets for the region.

Negative impacts likely to be associated with the floral ecology within the study area include, but are not limited to, the following:

- Placement of infrastructure and/or construction material within natural habitat outside of the authorised footprint;
- Failure to implement rehabilitation efforts in disturbed areas surrounding the proposed footprint areas;
- Destruction of floral habitat during construction activities; and
- AIP proliferation in disturbed areas and subsequent spread into surrounding natural areas.

### **Impact on Floral Species of Conservation Concern**

Two protected NFA tree species, namely *Sclerocarya birrea* subsp. *caffra* and *Combretum imberbe*, were recorded within the study area. Only *S. birrea* subsp. *caffra* was recorded within both habitat units whereas *Combretum imberbe* was only recorded within the Disturbed Thornveld. A LEMA protected species, namely *Huernia* sp., was recorded within the study area, particularly within the Disturbed Thornveld. No floral species as per TOPS were recorded within the study area. However, suitable habitat for such species is available within the study area.

If the construction of the proposed cable repair workshop area is authorised, a summer season walkdown of the footprint area is recommended in which all SCC are recorded and marked for permit application purposes (be it for rescue and relocation initiatives, or destruction of the specimens). All SCC species recorded during the recommended footprint walkdown should first be investigated for possible relocation to suitable habitat outside the direct footprint (as far as is feasible) – destruction of SCC should only be considered as a last resort. Good record-keeping will be necessary to record this process and to document all successes and failures associated with the relocation. Rescue and relocation should be done by a suitably qualified specialist. Any additional floral SCC encountered during the construction phase of the proposed project should also be relocated by a suitably qualified specialist and the necessary permits should be applied for. Permits required for the relocation or destruction/removal of SCC prior to vegetation clearing must be obtained by the relevant authorities, i.e., from the LEDET and/or the DFFE.



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It is recommended that for species that cannot be relocated, seedlings and /or seeds of these species are harvested from the development footprint area before clearing activities commence and grown under nursery conditions with the purpose to use these species for rehabilitation at a later stage.

### **Impact on CBAs, ESAs, Threatened Vegetation and Protected Areas**

Due to their largely modified and degraded natures, none of the habitat units within the study area were considered representative of the reference vegetation type, namely the Makhado Sweet Bushveld.

The study area is not located within a protected area, a threatened vegetation type, or a threatened ecosystem. According to the Limpopo C-Plan, the study area is located entirely within an ESA1. The triggered sensitivity feature included the presence of an ESA1. However, the Disturbed Thornveld and the Secondary Thornveld Habitats has been significantly impacted by anthropogenic influences and edge effects. As such ESA habitat and associated connective corridors across the study area and surrounding area, was not confirmed for the study area.

### **Probable Residual Impacts**

Even with extensive mitigation, residual impacts on the receiving floral ecological environment are deemed likely. The following points highlight the key latent impacts that have been identified:

- Continued AIP proliferation and woody encroachment to adjacent natural vegetation communities.

### **Cumulative Impacts**

The greatest threat to the floral ecology within the study area and the local region is the ongoing proliferation of poorly managed AIP species and woody encroachment (as a result of overgrazing practices) which can result in an overall cumulative loss of native floral communities within the area.



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## 7. CONCLUSION

STS was appointed by SRK Consulting (South Africa) to conduct an indigenous vegetation assessment as part of the EA process to authorise the proposed cable repair workshop as part of a combined process with the M3C pre-assembly yard.

During the field assessment, two broad habitat units were identified within the study area, namely Disturbed Thornveld Habitat and Secondary Thornveld Habitat. Indigenous vegetation was recorded within the Disturbed Thornveld; however, no indigenous vegetation was recorded within the Secondary Thornveld Habitat. The sensitivities, from a floral perspective, of each of the habitat units was as follows: the Secondary Thornveld Habitat was of a **low sensitivity** and the Disturbed Habitat was of a **moderately low sensitivity**.

No TOPS species were observed during the field assessment. However, two protected tree species as per the NFA, namely *Sclerocarya birrea* subsp. *caffra* and *Combretum imberbe* were identified within the study area. A LEMA protected species, namely *Heurnia* sp., was recorded within the Disturbed Thornveld Habitat and has the potential to occur within the Secondary Thornveld Habitat.

The study area is not located within a protected area, a threatened vegetation type, or a threatened ecosystem. According to the Limpopo Conservation Plan, the study area is located entirely within an ESA1. However, the Disturbed Thornveld and the Secondary Thornveld Habitats has been significantly impacted by anthropogenic influences and edge effects. As such ESA habitat and associated connective corridors across the study area and surrounding area, was not confirmed for the study area.

The proposed project will not impact on indigenous vegetation within the Secondary Thornveld Habitat but will however impact on indigenous vegetation with the Disturbed Thornveld Habitat. The overall, combined significance of impacts on indigenous vegetation prior to the implementation of mitigation measures was medium across the study area. With the implementation of mitigation measures, the proposed impact significance is anticipated to be low.

It is the opinion of the ecologists that this study provides the relevant information required to implement Integrated Environmental Management (IEM) and to ensure that the best long-term use of the ecological resources in the study area will be made in support of the principle of sustainable development.



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## **APPENDIX A: Indemnity and Terms of Use of this Report**

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. The report is based on survey and assessment techniques which are limited by seasonality, time and budgetary constraints relevant to the type and level of investigation undertaken as well as the project program and STS CC and its staff, at their sole discretion, reserve 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.

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



## APPENDIX B: Legislative Requirements

### THE CONSTITUTION OF THE REPUBLIC OF SOUTH AFRICA, 1996

The environment and the health and well-being of people are safeguarded under the Constitution of the Republic of South Africa, 1996 by way of section 24. Section 24(a) guarantees a right to an environment that is not harmful to human health or well-being and to environmental protection for the benefit of present and future generations. Section 24(b) directs the state to take reasonable legislative and other measures to prevent pollution, promote conservation, and secure the ecologically sustainable development and use of natural resources (including water and mineral resources) while promoting justifiable economic and social development. Section 27 guarantees every person the right of access to sufficient water, and the state is obliged to take reasonable legislative and other measures within its available resources to achieve the progressive realisation of this right. Section 27 is defined as a socio-economic right and not an environmental right. However, read with section 24 it requires of the state to ensure that water is conserved and protected and that sufficient access to the resource is provided. Water regulation in South Africa places a great emphasis on protecting the resource and on providing access to water for everyone.

### THE CONSERVATION OF AGRICULTURAL RESOURCES ACT, 1983 (ACT NO. 43 OF 1983) (CARA)

Removal of the alien and weed species encountered in the application area must take place in order to comply with existing legislation (amendments to the regulations under the CARA, 1983 and Section 28 of the NEMA, 1998). Removal of species should take place throughout the construction and operation, phases.

### THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT, 1998 (ACT NO. 107 OF 1998) (NEMA)

The National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA) and the associated Environmental Impact Assessment (EIA) Regulations (GN R326 as amended in 2017 and well as listing notices 1, 2 and 3 (GN R327, R325 and R324 of 2017), state that prior to any development taking place which triggers any activity as listed within the abovementioned regulations, an environmental authorisation process needs to be followed. This could follow either the Basic Assessment process or the Environmental Impact Assessment process depending on the nature of the activity and scale of the impact.

### THE NATIONAL ENVIRONMENTAL MANAGEMENT BIODIVERSITY ACT, 2004 (ACT NO. 10 OF 2004) (NEMBA)

The objectives of this act are (within the framework of NEMA) to provide for:

- The management and conservation of biological diversity within the Republic of South Africa and of the components of such diversity;
- The use of indigenous biological resources in a sustainable manner;
- The fair and equitable sharing among stakeholders of the benefits arising from bio prospecting involving indigenous biological resources;
- To give effect to ratify international agreements relating to biodiversity which are binding to the Republic;
- To provide for cooperative governance in biodiversity management and conservation; and
- To provide for a South African National Biodiversity Institute to assist in achieving the objectives of this Act.

This act alludes to the fact that management of biodiversity must take place to ensure that the biodiversity of the surrounding areas is not negatively impacted upon, by any activity being undertaken, in order to ensure the fair and equitable sharing among stakeholders of the benefits arising from indigenous biological resources.



Furthermore, a person may not carry out a restricted activity involving either:

- a) A specimen of a listed threatened or protected species;
- b) Specimens of an alien species; or
- c) A specimen of a listed invasive species without a permit.

## **GOVERNMENT NOTICE NUMBER R.1020: ALIEN AND INVASIVE SPECIES REGULATIONS, 2020 (IN GOVERNMENT GAZETTE 43735), INCLUDING GOVERNMENT NOTICE NUMBER 1003: ALIEN AND INVASIVE SPECIES LISTS, 2020 (IN GOVERNMENT GAZETTE 43726) AS IT RELATES TO THE NEMBA**

NEMBA is administered by the Department of Environmental Affairs and aims to provide for the management and conservation of South Africa's biodiversity within the framework of the NEMA. In terms of alien and invasive species. This act in terms of alien and invasive species aims to:

- Prevent the unauthorised introduction and spread of alien and invasive species to ecosystems and habitats where they do not naturally occur,
- Manage and control alien and invasive species, to prevent or minimise harm to the environment and biodiversity; and
- Eradicate alien species and invasive species from ecosystems and habitats where they may harm such ecosystems or habitats.

Alien species are defined, in terms of the National Environmental Management: Biodiversity Act, 2004 (Act no 10 of 2004) as:

- (a) A species that is not an indigenous species; or
- (b) An indigenous species translocated or intended to be translocated to a place outside its natural distribution range in nature, but not an indigenous species that has extended its natural distribution range by natural means of migration or dispersal without human intervention.

Categories according to NEMBA (Alien and Invasive Species Regulations, 2020):

- **Category 1a:** Invasive species that require compulsory control;
- **Category 1b:** Invasive species that require control by means of an invasive species management programme;
- **Category 2:** Commercially used plants that may be grown in demarcated areas, provided that there is a permit and that steps are taken to prevent their spread; and
- **Category 3:** Ornamentally used plants that may no longer be planted.

## **THE NATIONAL FOREST ACT, 1998 (ACT NO. 10 OF 1998) (NFA)**

According to the department of Department of Forestry, Fisheries, and the Environment (DFFE) (previously the Department of Agriculture, Forestry and Fisheries (DAFF)) ©2019 website (<https://www.daff.gov.za/daffweb3/>):

“In terms of the National Forests Act of 1998 certain tree species (types of trees) can be identified and declared as protected. The Department of Water Affairs and Forestry followed an objective, scientific and participative process to arrive at the new list of protected tree species, enacted in 2004. All trees occurring in natural forests are also protected in terms of the Act. Protective actions take place within the framework of the Act as well as national policy and guidelines. Trees are protected for a variety of reasons, and some species require strict protection while others require control over harvesting and utilisation.”

Applicable sections of the NFA pertaining to the proposed project include the below:

### **Section 12:**

Declaration of trees as protected

- 1) The Minister may declare-
  - a. particular tree,
  - b. a particular group of trees,
  - c. a particular woodland; or
  - d. trees belonging to a particular species,
 to be a protected tree, group of trees, woodland or species.



- 2) The Minister may make such a declaration only if he or she is of the opinion that the tree, group of trees, woodland or species is not already adequately protected in terms of other legislation.
- 3) In exercising a discretion in terms of this section, the Minister must consider the principles set out in section 3(3) of the NFA.

**Section 15(1):**

No person may cut, disturb, damage or destroy any protected tree or possess, collect, remove, transport, export, purchase, sell, donate or in any other manner acquire or dispose of any protected tree or any forest product derived from a protected tree, except under a licence granted by the Minister or in terms of an exemption from the provisions of this subsection published by the Minister in the Gazette.

Contravention of this declaration is regarded as a first category offence that may result in a person who is found guilty of being sentenced to a fine or imprisonment for a period up to three years, or both a fine and imprisonment.

**LIMPOPO ENVIRONMENTAL MANAGEMENT ACT (ACT NO. 7 OF 2003) (LEMA)**

The objectives of this Act are:

- to manage and protect the environment in the Province;
- to secure ecologically sustainable development and responsible use of natural resources in the Province;
- generally, to contribute to the progressive realisation of the fundamental rights contained in section 24 of the Constitution of the Republic of South Africa Act, 1996 (Act No. 108 of 1996), and
- to give effect to international agreements effecting environmental management which are binding on the Province.

This Act must be interpreted and applied in accordance with the national environmental management principles set out in Section 2 of the National Environmental Management Act, 1998 (Act No. 107 of 1998).



## APPENDIX C: Floral Method of Assessment

### *Floral Species of Conservational Concern Assessment*

Prior to the site visit, a record of floral SCC and their habitat requirements was developed for the study area, which includes consulting the National Web-based Environmental Screening Tool. Because not all SCC have been included in the Screening Tool layers (e.g., NT and DD taxa), it remains important for the specialist to be on the lookout for additional SCC. For this study, two primary sources were consulted and are described below.

#### **The National Web-Based Environmental Screening Tool**

The Screening Tool was accessed to obtain a list of potentially occurring species of conservation concern for the study area. Each of the themes in the Screening Tool consists of theme-specific spatial datasets which have been assigned a sensitivity level namely, “*low*”, “*medium*”, “*high*” and “*very high*” sensitivity. The four levels of sensitivity are derived and identified in different ways, e.g. for **confirmed** areas of occupied habitat for SCC a Very High and High Sensitivity is assigned and for areas of suitable habitat where SCC may occur based on spatial models only, a Medium Sensitivity is assigned. The different sensitivity ratings pertaining to the Plant [and Animal] Protocols are described below<sup>12</sup>:

- **Very High:** Habitat for species that are endemic to South Africa, where all the known occurrences of that species are within an area of 10 km<sup>2</sup> are considered Critical Habitat, as all remaining habitat is irreplaceable. Typically, these include species that qualify under Critically Endangered (CR), Endangered (EN), or Vulnerable (VU) D criteria of the IUCN or species listed as Critically/ Extremely Rare under South Africa’s National Red List Criteria. For each species reliant on a Critical Habitat, all remaining suitable habitat has been manually mapped at a fine scale.
- **High:** Recent occurrence records for all threatened (CR, EN, VU) and/or rare endemic species are included in the high sensitivity level. Spatial polygons of suitable habitat have been produced for each species by intersecting recently collected occurrence records (those collected since the year 2000) that have a spatial confidence level of less than 250 m with segments of remaining natural habitat.
- **Medium:** Model-derived suitable habitat areas for threatened and/or rare species are included in the medium sensitivity level. Two types of spatial models have been included. The first is a simple rule-based habitat suitability model where habitat attributes such as vegetation type and altitude are selected for all areas where a species has been recorded to occur. The second is a species distribution model which uses species occurrence records combined with multiple environmental variables to quantify and predict areas of suitable habitat. The models provide a probability-based distribution indicating a continuous range of habitat suitability across areas that have not been previously surveyed. A probability threshold of 75% for suitable habitat has been used to convert the modelled probability surface and reduce it into a single spatial area which defines areas that fall within the medium sensitivity level.
- **Low:** Areas where no SCC are known or expected to occur.

#### **BRAHMS Online Website**

The Botanical Database of Southern Africa (BODATSA) is accessed to obtain plant names and floristic details (<http://posa.sanbi.org/>) for species of conservation concern within a selected boundary;

- 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 BODATSA, which contains records from the National Herbarium in Pretoria (PRE), the

<sup>12</sup> More details on the use of the Screening Tool for Species of Conservation Concern can be found in the below resources:

- South African National Biodiversity Institute (SANBI). 2020. Draft Species Environmental Assessment Guideline. Guidelines for the implementation of the Terrestrial Flora (3c) & Terrestrial Fauna (3d) Species Protocols for environmental impact assessments in South Africa. South African National Biodiversity Institute, Pretoria. Version 1.0.
- The National Web based Environmental Screening Tool website: <https://screening.environment.gov.za/screeningtool/#/pages/welcome>



Compton Herbarium in Cape Town (NBG & SAM) and the KwaZulu-Natal Herbarium in Durban (NH).

- Information on habitat requirements etc. is obtained from the SANBI Red List of South African Plants website (<http://redlist.sanbi.org/>).
- Typically, data is extracted for the Quarter Degree Square (QDS) in which the study area is situated but where it is deemed appropriate, a larger area can be included.

### NEMBA TOPS Species

The Threatened or Protected Species (TOPS) Regulations (R 152 of 2007) under Section 56(1) of the National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004) (NEMBA), were taken into consideration.

### NFA Species

Tree species as per the National Forest Act, 1998 (Act No. 84 of 1998) (NFA), were included in the SCC assessment.

### LEMA - Specially Protected and Protected Species

The Limpopo Environmental Management Act, 2003 (Act No. 7 of 2003) (LEMA) provides a list of Specially Protected Plants (Schedule 11) and Protected Plants (Schedule 12) for the Limpopo Province. These species formed part of the SCC assessment. The list is available online at the following link: [https://www.unodc.org/res/cld/document/limpopo-environmental-management-act-7-of-2003.html/Limpopo\\_Enviro\\_Management\\_Act.pdf](https://www.unodc.org/res/cld/document/limpopo-environmental-management-act-7-of-2003.html/Limpopo_Enviro_Management_Act.pdf)

Throughout the floral assessment, special attention was paid to the identification of any of these SCC as well as the identification of suitable habitat that could potentially support these species.

The Probability of Occurrence (POC) for each floral SCC is described:

- **“Confirmed”**: if observed during the survey;
- **“High”**: if within the species’ known distribution range and suitable habitat is available;
- **“Medium”**: if either within the known distribution range of the species or if suitable habitat is present; or
- **“Low”**: if the habitat is not suitable and falls outside the distribution range of the species.

|         |            |          |           |
|---------|------------|----------|-----------|
| Low POC | Medium POC | High POC | Confirmed |
|---------|------------|----------|-----------|

The accuracy of the POC is based on the available knowledge about the species in question, with many of the species lacking in-depth habitat research.

### Floral Habitat Sensitivity

The floral habitat sensitivity of each habitat unit was determined by calculating the mean of five different parameters which influence floral communities and provide an indication of the overall floristic ecological integrity, importance, and sensitivity of the habitat unit. Each of the following parameters are subjectively rated on a scale of 1 to 5 (1 = lowest and 5 = highest):

- **Floral SCC**: The confirmed presence or potential for floral SCC or any other significant species, such as endemics, to occur within the habitat unit;
- **Unique Landscapes**: The presence of unique landscapes or the presence of an ecologically intact habitat unit in a transformed region;
- **Conservation Status**: The conservation status of the ecosystem or vegetation type in which the habitat unit is situated based on local, regional and national databases. Whether the habitat is representative of a Critical Biodiversity Area or forms part of an Ecological Support Area is also taken into consideration;
- **Floral Diversity**: The recorded floral diversity compared to a suitable reference condition such as surrounding natural areas or available floristic databases; and



- **Habitat Integrity:** The degree to which the habitat unit is transformed based on observed disturbances which may affect habitat integrity.

Each of these values contribute equally to the mean score, which determines the floral habitat sensitivity class in which each habitat unit falls. A conservation and land-use objective is also assigned to each sensitivity class which aims to guide the responsible and sustainable utilization of the habitat unit in question. To present the results use is made of spider diagrams to depict the significance of each aspect of floral ecology for each vegetation type. The different classes and land-use objectives are presented in the table below:

**Table C1: Floral habitat sensitivity rankings and associated land-use objectives.**

| Score     | Rating significance | Conservation objective  |
|-----------|---------------------|---|
| 1 < 1.5   | Low                 | Optimise development potential.   |
| ≥1.5 <2.5 | Moderately low      | Optimise development potential while improving biodiversity integrity of surrounding natural habitat and managing edge effects. |
| ≥2.5 <3.5 | Intermediate        | Preserve and enhance biodiversity of the habitat unit and surrounds while optimizing development potential.                     |
| ≥3.5 <4.5 | Moderately high     | Preserve and enhance the biodiversity of the habitat unit, limit development and disturbance.                                   |
| ≥4.5 ≤5.0 | High                | Preserve and enhance the biodiversity of the habitat unit, no-go alternative must be considered.                                |

## Vegetation Surveys

When planning the timing of a floristic survey, it is important to remember that the primary objective is not an exhaustive species list but rather to ensure that sufficient data are collected to describe all the vegetation communities present in the area of interest, to optimise the detection of SCC and to assess habitat suitability for other potentially occurring SCC (SANBI, 2020).

The vegetation survey incorporates the subjective (or stratified) sampling method. Subjective sampling is a sampling technique in which the specialist relies on his or her own professional experience when choosing sample sites within the study area. This allows representative recordings of floral communities and optimal detection of SCC. Subjective sampling is used to consider different areas (or habitat units) which are identified within the main body of a habitat/study area.

One of the problems with random sampling, another popular sampling method, is that random samples may not cover all areas of a study area equally and thus increase the potential to miss floral SCC. Random sampling methods also tend to require more time in the field to locate the amount of SCC that can be detected using subjective sampling methods - In the context of an BA where time constraints are often restrictive, priority needs to be given to collecting data in the shortest time possible without compromising the efficiency of locating SCC (SANBI, 2020).

Vegetation structure has been described following the guideline in Edwards (1983). Refer to Figure C1 below:





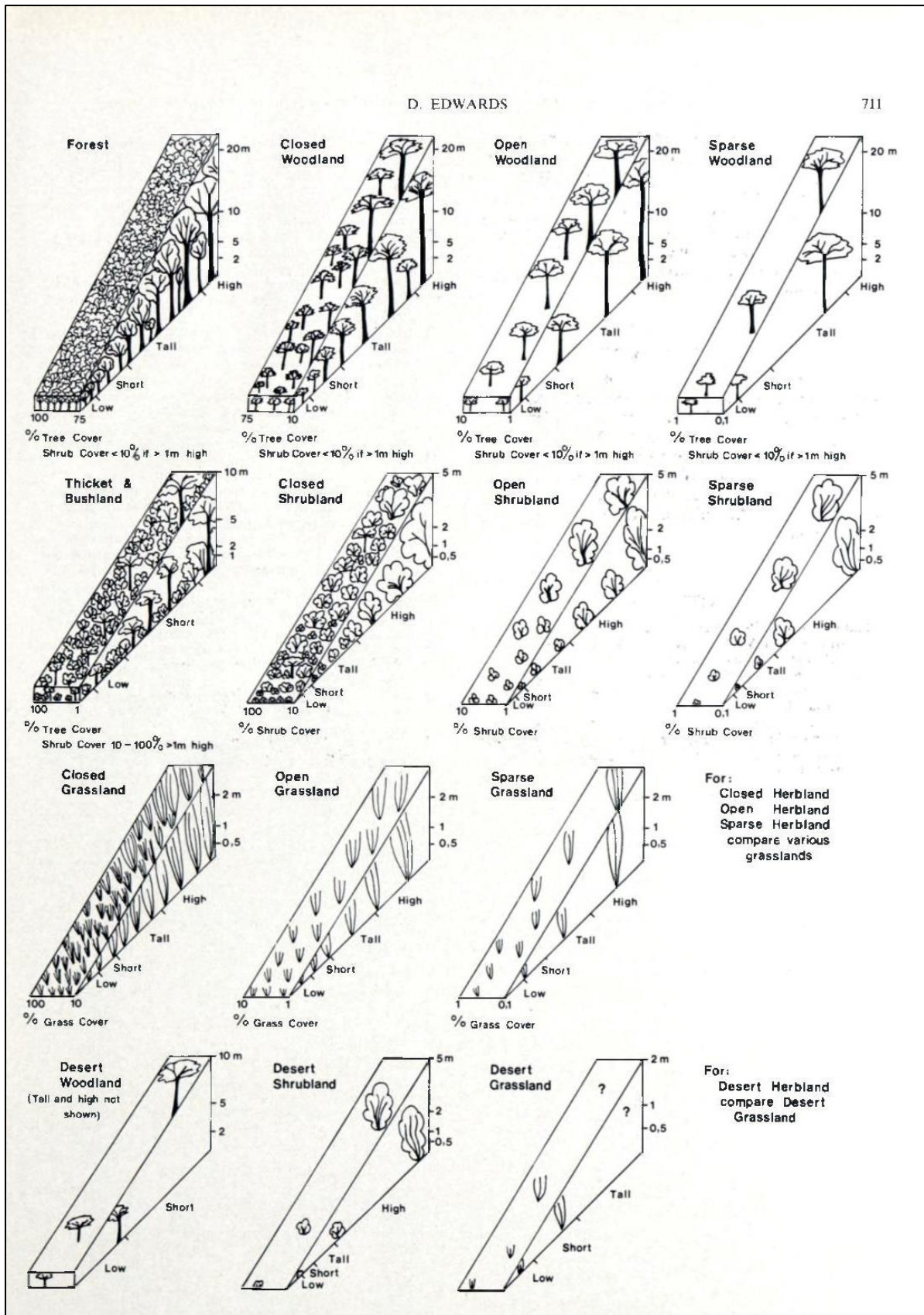


Figure C1: Diagrammatic representation of structural groups and formation classes. Only dominant growth forms are shown.



## APPENDIX D: Impact Assessment Methodology (SRK)

For the EAP to allow for sufficient consideration of all environmental impacts, impacts were assessed using a common, defensible method of assessing significance that will enable comparisons to be made between risks/impacts and will enable authorities, stakeholders and the client to understand the process and rationale upon which risks/impacts have been assessed. The method to be used for assessing risks/impacts is outlined in the sections below.

### Impact Assessment Methodology

The anticipated impacts associated with the proposed project have been assessed according to SRK’s standardised impact assessment methodology which is presented below. This methodology has been formalised to comply with Regulation 31(2) (l) of the National Environmental Management Act (Act 107 of 1998) (NEMA), which states the following:

“An environmental impact assessment report must contain all information that is necessary for the competent authority to consider the application and to reach a decision, and must include;

- I. An assessment of each identified potentially significant impact, including:
  - a. Cumulative impacts;
  - b. The nature of the impact;
  - c. The extent and duration of the impact;
  - d. The probability of the impact occurring;
  - e. The degree to which the impact can be reversed;
  - f. The degree to which the impact may cause irreplaceable loss of resources; and
  - g. The degree to which the impact can be mitigated.”

Based on the above, the EIA Methodology will require that each potential impact identified is clearly described (providing the nature of the impact) and be assessed in terms of the following factors:

- **Extent** (spatial scale) - will the impact affect the national, regional or local environment, or only that of the site;
- **Duration** (temporal scale) - how long will the impact last;
- **Magnitude** (severity) - will the impact be of high, moderate or low severity; and
- **Probability** (likelihood of occurring) - how likely is it that the impact may occur.

To enable a scientific approach for the determination of the environmental significance (importance) of each identified potential impact, a numerical value has been linked to each factor.

The following ranking scales are applicable:

| Occurrence | Duration:  | Probability:             |
|------------|--|--------------------------|
|            | 5 – Permanent                                    | 5 – Definite/don't know  |
|            | 4 – Long-term (ceases with the operational life) | 4 – Highly probable      |
|            | 3 – Medium-term (5-15 years)                     | 3 – Medium probability   |
|            | 2 – Short-term (0-5 years)                       | 2 – Low probability      |
|            | 1 – Immediate                                    | 1 – Improbable           |
|            | 0 – None   |                          |
| Severity   | Extent/scale:                                    | Magnitude:               |
|            | 5 – International                                | 10 – Very high/uncertain |
|            | 4 – National                                     | 8 – High                 |
|            | 3 – Regional                                     | 6 – Moderate             |
|            | 2 – Local  | 4 – Low                  |
|            | 1 – Site only                                    | 2 – Minor                |
| 0 – None   |  |                          |

Once the above factors had been ranked for each identified potential impact, the environmental significance of each impact can be calculated using the following formula:



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### **Significance = (duration + extent + magnitude) x probability**

The maximum value that can be calculated for the environmental significance of any impact is 100.

The environmental significance of any identified potential impact is then rated as either: high, moderate or low on the following basis:

- More than 60 significance value indicates a high (H) environmental significance impact;
- Between 30 and 60 significance value indicates a moderate (M) environmental significance impact; and
- Less than 30 significance value indicates a low (L) environmental significance impact.

In order to assess the degree to which the potential impact can be reversed, and be mitigated, each identified potential impact will need to be assessed twice;

- Firstly, the potential impact will be assessed and rated prior to implementing any mitigation and management measures; and
- Secondly, the potential impact will be assessed and rated after the proposed mitigation and management measures have been implemented.

The purpose of this dual rating of the impact before and after mitigation is to indicate that the significance rating of the initial impact is and should be higher in relation to the significance of the impact after mitigation measures have been implemented.

To assess the degree to which the potential impact can cause irreplaceable loss of resources, the following classes (%) will be used and will need to be selected based on your informed decision and discretion:

- 5 100% - Permanent loss
- 4 75% - 99% - significant loss
- 3 50% - 74% - moderate loss
- 2 25% - 49% - minor loss
- 1 0% - 24% - limited loss

Please note that the Loss of Resources aspect will not affect the overall significance rating of the impact.

In terms of assessing the cumulative impacts, it must be addressed in a sentence/paragraph fashion as the spatial extent of the cumulative impacts will vary from project to project. Cumulative impact, in relation to an activity, means the impact of an activity that in itself may not be significant, but may become significant when added to the existing or potential impacts eventuating from similar or diverse activities or undertakings in the area.

### ***Mitigation measure development***

The following points presents the key concepts considered in the development of mitigation measures for the proposed construction:

- Mitigation and performance improvement measures and actions that address the risks and impacts<sup>13</sup> are identified and described in as much detail as possible. Mitigating measures are investigated according to the impact minimisation hierarchy as follows:
  - Avoidance or prevention of impact;
  - Minimisation of impact; and
  - Rehabilitation.
- Measures and actions to address negative impacts will favour avoidance and prevention over minimisation, mitigation, or compensation; and

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<sup>13</sup> Mitigation measures should address both positive and negative impacts



- Desired outcomes are defined and have been developed in such a way as to be measurable events with performance indicators, targets and acceptable criteria that can be tracked over defined periods, wherever possible.

## ***Recommendations***

Recommendations were developed to address and mitigate impacts associated with the proposed projects. These recommendations also include general management measures which apply to the proposed projects as a whole. Mitigation measures have been developed to address issues in all phases throughout the life of the projects from planning, through to construction & operation, as well as decommissioning and rehabilitation.



## APPENDIX E: Vegetation Type(s)

### Makhado Sweet Bushveld

**Remarks:** This area is transitional between the higher-lying Polokwane Plateau and the lower-lying vegetation units of the Limpopo River Valley.

**Table E1: Dominant & typical floristic species of the Makhado Sweet Bushveld (Mucina & Rutherford, 2012)**

| Group                     | Species  |
|---------------------------|--|
| <b>Woody Species</b>      |  |
| <b>Small trees</b>        | <i>Senegalia erubescens</i> (d), <i>Vachellia gerrardii</i> (d), <i>S. mellifera</i> subsp. <i>detinens</i> (d), <i>V. rehmanniana</i> (d), <i>Boscia albitrunca</i> (d), <i>Combretum apiculatum</i> (d), <i>V. tortilis</i> subsp. <i>heteracantha</i> , <i>Terminalia sericea</i>   |
| <b>Tall shrubs</b>        | <i>Commiphora pyracanthoides</i> , <i>Dichrostachys cinerea</i> , <i>Grewia flava</i> , <i>Hibiscus calyphyllus</i> , <i>Lycium shawii</i> , <i>Rhigozum obovatum</i>  |
| <b>Low shrubs</b>         | <i>Barleria lancifolia</i> , <i>Hirpicium bechuanense</i> , <i>Indigofera polioties</i> , <i>Melhanie rehmannii</i> , <i>Pechuel-Loeschea leubnitziae</i>  |
| <b>Succulents</b>         |  |
| <b>Succulent shrubs</b>   | <i>Euphorbia bergii</i> , <i>Kalanchoe rotundifolia</i> , <i>Lycium cinereum</i> .   |
| <b>Herbaceous species</b> |  |
| <b>Herbs</b>              | <i>Chamaecrista absus</i> , <i>Corbichonia decumbens</i> , <i>Geigeria acaulis</i> , <i>Harpagophytum procumbens</i> subsp. <i>transvaalense</i> , <i>Heliotropium steudneri</i> , <i>Syncolostemon elliottii</i> , <i>Hermbstaedtia odorata</i> , <i>Leonotis sexdentata</i> , <i>Osteospermum muricatum</i> , <i>Tephrosia purpurea</i> subsp. <i>leptostachya</i> |
| <b>Graminoids</b>         |  |
| <b>Grasses</b>            | <i>Antheophora pubescens</i> (d), <i>Aristida stipitata</i> subsp. <i>graciliflora</i> (d), <i>Cenchrus ciliaris</i> (d), <i>Enneapogon scoparius</i> (d), <i>Brachiaria nigropedata</i> , <i>Eragrostis trichophora</i> , <i>Panicum coloratum</i> , <i>P. maximum</i> , <i>Schmidtia pappophoroides</i> , <i>Urochloa mosambicensis</i>                            |

\*(d) – Dominant species for the vegetation type



## APPENDIX F: Species List

### Observed and Expected Floral Species

**Table F1: Dominant floral species encountered in the study area. Alien species are indicated with an asterisk (\*).**

| Species  | Disturbed Thornveld | Secondary Thornveld |
|--|---------------------|---------------------|
| <b>Woody Species</b>                           |                     |                     |
| * <i>Delonix regia</i>                         |                     | X                   |
| * <i>Tecoma stans</i>                          |                     | X                   |
| <i>Asparagus suaveolens</i>                    | X                   | X                   |
| <i>Carissa bispinosa</i>                       | X                   |                     |
| <i>Clerodendrum ternatum</i>                   | X                   |                     |
| <i>Combretum apiculatum</i>                    | X                   |                     |
| <i>Combretum imberbe</i>                       | X                   |                     |
| <i>Dichrostachys cinerea</i>                   | X                   | X                   |
| <i>Diospyros lycioides</i>                     | X                   |                     |
| <i>Dodonaea viscosa</i>                        | X                   | X                   |
| <i>Euclea crispa</i>                           | X                   | X                   |
| <i>Euclea linearis</i>                         | X                   |                     |
| <i>Euclea undulata</i>                         | X                   | X                   |
| <i>Gomphocarpus fruticosus</i>                 | X                   | X                   |
| <i>Gossypium herbaceum</i>                     | X                   | X                   |
| <i>Grewia bicolor</i>                          | X                   |                     |
| <i>Grewia flava</i>                            | X                   | X                   |
| <i>Grewia vernicosa</i>                        | X                   |                     |
| <i>Gymnosporia buxifolia</i>                   | X                   | X                   |
| <i>Gymnosporia senegalensis</i>                | X                   |                     |
| <i>Lantana rugosa</i>                          | X                   |                     |
| <i>Ormocarpum trichocarpum</i>                 | X                   |                     |
| <i>Pappea capensis</i>                         | X                   |                     |
| <i>Sclerocarya birrea</i> subsp. <i>caffra</i> | X                   | X                   |
| <i>Searsia lancea</i>                          | X                   | X                   |
| <i>Searsia leptodictya</i>                     | X                   |                     |
| <i>Searsia pyroides</i>                        | X                   | X                   |
| <i>Senegalia burkei</i>                        | X                   | X                   |
| <i>Senegalia fleckii</i>                       | X                   |                     |
| <i>Tapinanthus oleifolius</i>                  | X                   | X                   |
| <i>Terminalia sericea</i>                      | X                   |                     |
| <i>Vachellia karroo</i>                        | X                   | X                   |
| <i>Vachellia tortilis</i>                      | X                   | X                   |
| <i>Ziziphus mucronata</i>                      | X                   | X                   |
| <b>Herbaceous Speices</b>                      |                     |                     |
| * <i>Bidens pilosa</i>                         | X                   | X                   |
| * <i>Flaveria bidentis</i>                     |                     | X                   |
| * <i>Gomphrena celosioides</i>                 | X                   | X                   |



| Species  | Disturbed Thornveld | Secondary Thornveld |
|--|---------------------|---------------------|
| * <i>Schkuhria pinnata</i>                       | X                   | X                   |
| * <i>Solanum elaeagnifolium</i>                  |                     | X                   |
| * <i>Tagetes minuta</i>                          | X                   | X                   |
| <i>Abutilon</i> sp.                              | X                   | X                   |
| <i>Berkheya</i> sp.                              | X                   |                     |
| <i>Commelina benghalensis</i>                    | X                   |                     |
| <i>Corbichonia decumbens</i>                     | X                   |                     |
| <i>Dicerocaryum senecioides</i>                  | X                   | X                   |
| <i>Dipcadi</i> cf. <i>virida</i>                 | X                   | X                   |
| <i>Felicia</i> sp.                               | X                   |                     |
| <i>Helichrysum</i> sp.                           | X                   |                     |
| <i>Hirpicium bechuanense</i>                     | X                   |                     |
| <i>Indigastrum costatum</i>                      | X                   |                     |
| <i>Indigophera</i> sp.                           | X                   | X                   |
| <i>Ipomoea sinensis</i>                          | X                   | X                   |
| <i>Lagerra decurrens</i>                         |                     | X                   |
| <i>Leonotis</i> sp.                              | X                   | X                   |
| <i>Phyllanthus parvulus</i> var. <i>parvulus</i> | X                   | X                   |
| <i>Polygala hotentotta</i>                       | X                   | X                   |
| <i>Rhynchosia</i> cf. <i>minima</i>              | X                   |                     |
| <i>Rhynchosia totta</i> var. <i>totta</i>        | X                   |                     |
| <i>Senna italica</i> subsp. <i>arachoides</i>    | X                   | X                   |
| <i>Solanum campylacanthum</i>                    | X                   | X                   |
| <i>Tephrosa</i> sp.                              | X                   |                     |
| <i>Tuhlbagia</i> sp.                             | X                   |                     |
| <i>Xenostegia tridentata</i>                     | X                   |                     |
| Succulent Species                                |                     |                     |
| * <i>Agave sisalana</i>                          | X                   | X                   |
| * <i>Opuntia</i> cf. <i>ficus-indica</i>         | X                   | X                   |
| <i>Aloe marlothii</i>                            | X                   |                     |
| <i>Aloe transvaalensis</i>                       | X                   | X                   |
| <i>Cynanchum viminalis</i>                       | X                   | X                   |
| <i>Huernia</i> sp.                               | X                   |                     |
| <i>Kalanchoe rotundifolia</i>                    | X                   | X                   |
| <i>Kleinia longifolia</i>                        | X                   |                     |
| <i>Senecio barbertonicus</i>                     | X                   |                     |
| <i>Viscum rotundifolium</i>                      | X                   | X                   |
| Graminoid Speices                                |                     |                     |
| * <i>Pennisetum setaceum</i>                     |                     | X                   |
| <i>Aristida congesta</i> subsp. <i>Congesta</i>  | X                   | X                   |
| <i>Cenchrus ciliaris</i>                         | X                   |                     |
| <i>Cynodon dactylon</i>                          | X                   | X                   |
| <i>Fingerhuttia africana</i>                     | X                   |                     |
| <i>Heteropogon contortus</i>                     | X                   | X                   |
| <i>Hyparrhenia hirta</i>                         | X                   | X                   |



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| Species                       | Disturbed Thornveld | Secondary Thornveld |
|-------------------------------|---------------------|---------------------|
| <i>Melinis repens</i>         | x                   | x                   |
| <i>Panicum maximum</i>        | x                   | x                   |
| <i>Stipagrostis uniplumis</i> | x                   |                     |





## APPENDIX G: Floral SCC

South Africa uses the internationally endorsed IUCN Red List Categories and Criteria in the Red List of South African plants. This scientific system is designed to measure species' risk of extinction. The purpose of this system is to highlight those species that are most urgently in need of conservation action. For the POC assessment, a list of Red Data Listed (RDL) species previously recorded within the 10 km of the study area was pulled from the Botanical Database of Southern Africa (BODATSA) (<http://posa.sanbi.org/>). This list was further cross-checked with the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA) TOPS flora) to identify provincially protected species previously recorded for the area.

### Definitions of the national Red List categories

Categories marked with <sup>N</sup> are non-IUCN, national Red List categories for species not in danger of extinction but considered of conservation concern. The IUCN equivalent of these categories is Least Concern (LC).

- **Extinct (EX)** A species is Extinct when there is no reasonable doubt that the last individual has died. Species should be classified as Extinct only once exhaustive surveys throughout the species' known range have failed to record an individual.
- **Extinct in the Wild (EW)** A species is Extinct in the Wild when it is known to survive only in cultivation or as a naturalized population (or populations) well outside the past range.
- **Regionally Extinct (RE)** A species is Regionally Extinct when it is extinct within the region assessed (in this case South Africa), but wild populations can still be found in areas outside the region.
- **Critically Endangered, Possibly Extinct (CR PE)** Possibly Extinct is a special tag associated with the category Critically Endangered, indicating species that are highly likely to be extinct, but the exhaustive surveys required for classifying the species as Extinct has not yet been completed. A small chance remains that such species may still be rediscovered.
- **Critically Endangered (CR)** A species is Critically Endangered when the best available evidence indicates that it meets at least one of the five IUCN criteria for Critically Endangered, indicating that the species is facing an extremely high risk of extinction.
- **Endangered (EN)** A species is Endangered when the best available evidence indicates that it meets at least one of the five IUCN criteria for Endangered, indicating that the species is facing a very high risk of extinction.
- **Vulnerable (VU)** A species is Vulnerable when the best available evidence indicates that it meets at least one of the five IUCN criteria for Vulnerable, indicating that the species is facing a high risk of extinction.
- **Near Threatened (NT)** A species is Near Threatened when available evidence indicates that it nearly meets any of the IUCN criteria for Vulnerable and is therefore likely to become at risk of extinction in the near future.
- <sup>N</sup>**Critically Rare** A species is Critically Rare when it is known to occur at a single site but is not exposed to any direct or plausible potential threat and does not otherwise qualify for a category of threat according to one of the five IUCN criteria.
- <sup>N</sup>**Rare** A species is Rare when it meets at least one of four South African criteria for rarity but is not exposed to any direct or plausible potential threat and does not qualify for a category of threat according to one of the five IUCN criteria. The four criteria are as follows:
  - Restricted range: Extent of Occurrence <500 km<sup>2</sup>, OR



- Habitat specialist: Species is restricted to a specialized microhabitat so that it has a very small Area of Occupancy, typically smaller than 20 km<sup>2</sup>, OR
- Low densities of individuals: Species always occurs as single individuals or very small subpopulations (typically fewer than 50 mature individuals) scattered over a wide area, OR
- Small global population: Less than 10 000 mature individuals.
- **Least Concern** A species is Least Concern when it has been evaluated against the IUCN criteria and does not qualify for any of the above categories. Species classified as Least Concern are considered at low risk of extinction. Widespread and abundant species are typically classified in this category.
- **Data Deficient - Insufficient Information (DDD)** A species is DDD when there is inadequate information to make an assessment of its risk of extinction, but the species is well defined. Listing of species in this category indicates that more information is required, and that future research could show that a threatened classification is appropriate.
- **Data Deficient - Taxonomically Problematic (DDT)** A species is DDT when taxonomic problems hinder the distribution range and habitat from being well defined, so that an assessment of risk of extinction is not possible.
- **Not Evaluated (NE)** A species is Not Evaluated when it has not been evaluated against the criteria. The national Red List of South African plants is a comprehensive assessment of all South African indigenous plants, and therefore all species are assessed and given a national Red List status. However, some species included in [Plants of southern Africa: an online checklist](#) are species that do not qualify for national listing because they are naturalized exotics, hybrids (natural or cultivated), or synonyms. These species are given the status Not Evaluated and the reasons why they have not been assessed are included in the assessment justification.

The below tables present the results of the POC assessment.

## POC for RDL Floral SCC

### NEMBA TOPS List for South Africa<sup>14</sup>

Table G1: TOPS list for South Africa – plant species.

| NEMBA TOPS LIST (PLANT SPECIES) |                       |     |  |                     |
|---------------------------------|-----------------------|-----|--|---------------------|
| Scientific Name                 | Common Name           | POC | Provincial Distribution  | Conservation Status |
| <i>Adenia wilmsii</i>           | No common name        | Low | <b>Provincial distribution:</b> Mpumalanga<br><b>Range:</b> Lydenburg to Waterval Boven<br><b>Description:</b> Dolerite outcrops or red loam soil, in open woodland, 1300-1500 m.                  | EN; P               |
| <i>Adenium swazicum</i>         | Swaziland Impala Lily | Low | <b>Range:</b> Kruger National Park to Swaziland along the Lebombo Mountains and adjacent areas in south-western Mozambique.  | VU                  |
| <i>Adenium swazicum</i>         | Swaziland Impala Lily | Low | <b>Provincial distribution:</b> Mpumalanga   | VU                  |
| <i>Aloe albida</i>              | Grass Aloe            | Low | <b>Provincial distribution:</b> Mpumalanga<br><b>Range:</b> Aloe albida has a restricted range in the mountains south of Barberton, Mpumalanga, extending to Malolotja in north-western Swaziland. | NT                  |

<sup>14</sup> National Environmental Management: Biodiversity Act 10 of 2004 - Threatened or Protected Species Regulations, 2007. Government Notice R152 in Government Gazette 29657 dated 23 February 2007. Commencement date: 1 June 2007 [GN R150, Gazette no. 29657], as amended.



| NEMBA TOPS LIST (PLANT SPECIES)                           |                          |     |  |                     |
|---|--------------------------|-----|--|---------------------|
| Scientific Name   | Common Name              | POC | Provincial Distribution  | Conservation Status |
| <i>Aloe pillansii</i> (now <i>Aloidendron pillansii</i> ) | False Quiver Tree        | Low | <b>Provincial distribution:</b> Northern Cape<br><b>Range:</b> Richtersveld and southern Namibia.  | EN                  |
| <i>Aloe simii</i>   | No common name           | Low | <b>Provincial distribution:</b> Mpumalanga<br><b>Range:</b> This species is endemic to a small area in the transition area between the Mpumalanga Lowveld and Escarpment, where it occurs from Sabie southwards to White River and around Nelspruit.<br><b>Description:</b> It occurs along drainage lines and in wetlands in open woodland and grassland, 600-1100 m. | EN; P               |
| <i>Clivia mirabilis</i>                                   | "Oorlogskloof" Bush Lily | Low | <b>Provincial distribution:</b> Northern Cape, Western Cape  | VU; P               |
| <i>Diaphananche millarii</i>                              | Tree Orchid              | Low | <b>Provincial distribution:</b> Eastern Cape, KwaZulu-Natal<br><b>Range:</b> East London and Durban.   | VU                  |
| <i>Disa macrostachya</i>                                  | No common name           | Low | <b>Provincial distribution:</b> Northern Cape  | EN; P               |
| <i>Disa nubigena</i>                                      | No common name           | Low | <b>Provincial distribution:</b> Western Cape   | Rare; P             |
| <i>Disa physodes</i>                                      | No common name           | Low | <b>Provincial distribution:</b> Western Cape   | CR; P               |
| <i>Disa procera</i>                                       | No common name           | Low | <b>Provincial distribution:</b> Western Cape   | EN; P               |
| <i>Disa sabulosa</i>                                      | No common name           | Low | <b>Provincial distribution:</b> Western Cape   | EN; P               |
| <i>Encephalartos aemulans</i>                             | Ngotshe Cycad            | Low | <b>Provincial distribution:</b> KwaZulu-Natal  | CR                  |
| <i>Encephalartos altensteinii</i>                         | Bread Palm               | Low | <b>Provincial distribution:</b> Eastern Cape, KwaZulu-Natal  | VU; P               |
| <i>Encephalartos arenarius</i>                            | Dune Cycad               | Low | <b>Provincial distribution:</b> Eastern Cape   | EN                  |
| <i>Encephalartos brevifoliolatus</i>                      | Escarpment Cycad         | Low | <b>Provincial distribution:</b> Limpopo  | EW                  |
| <i>Encephalartos caffer</i>                               | Breadfruit Tree          | Low | <b>Provincial distribution:</b> Eastern Cape, KwaZulu-Natal  | NT; P               |
| <i>Encephalartos cerinus</i>                              | Waxen Cycad              | Low | <b>Provincial distribution:</b> KwaZulu-Natal  | CR                  |
| <i>Encephalartos cupidus</i>                              | Blyde River Cycad        | Low | <b>Provincial distribution:</b> Limpopo, Mpumalanga<br><b>Description:</b> Grassland, on steep, rocky slopes or cliffs and sometimes near seepage areas bordering gallery forests.   | CR                  |
| <i>Encephalartos dolomiticus</i>                          | Wolkberg Cycad           | Low | <b>Provincial distribution:</b> Limpopo  | CR                  |
| <i>Encephalartos dyerianus</i>                            | Lowveld Cycad            | Low | <b>Provincial distribution:</b> Limpopo  | CR; P               |
| <i>Encephalartos eugene-maraisii</i>                      | Waterberg Cycad          | Low | <b>Provincial distribution:</b> Limpopo  | EN                  |
| <i>Encephalartos friderici-guilielmi</i>                  | No common name           | Low | <b>Provincial distribution:</b> Eastern Cape, KwaZulu-Natal  | NT; P               |
| <i>Encephalartos ghellinckii</i>                          | No common name           | Low | <b>Provincial distribution:</b> Eastern Cape, KwaZulu-Natal  | VU; P               |
| <i>Encephalartos heenanii</i>                             | Woolly Cycad             | Low | <b>Provincial distribution:</b> Mpumalanga<br><b>Description:</b> Open areas of montane grasslands amidst scarp forest in deep valleys and ravines.  | CR                  |
| <i>Encephalartos hirsutus</i>                             | Venda Cycad              | Low | <b>Provincial distribution:</b> Limpopo  | CR                  |
| <i>Encephalartos horridus</i>                             | Eastern Cape Blue Cycad  | Low | <b>Provincial distribution:</b> Eastern Cape   | EN                  |
| <i>Encephalartos humilis</i>                              | No common name           | Low | <b>Provincial distribution:</b> Mpumalanga<br><b>Description:</b> Montane and mistbelt grassland, rocky sandstone slopes.  | VU; P               |



| NEMBA TOPS LIST (PLANT SPECIES)      |                   |        |   |                     |
|--------------------------------------|-------------------|--------|---|---------------------|
| Scientific Name                      | Common Name       | POC    | Provincial Distribution   | Conservation Status |
| <i>Encephalartos inopinus</i>        | Lydenburg Cycad   | Low    | Provincial distribution: Limpopo  | CR                  |
| <i>Encephalartos laevifolius</i>     | Kaapsehoop Cycad  | Low    | Provincial distribution: Eastern Cape, KwaZulu-Natal, Limpopo, Mpumalanga<br>Description: Steep, rocky slopes in mistbelt grassland, 1300-1500 m. | CR                  |
| <i>Encephalartos lanatus</i>         | No common name    | Low    | Provincial distribution: Gauteng and western Mpumalanga<br>Description: Sheltered, wooded ravines in sandstone ridges, 1200-1500 m.               | NT; P               |
| <i>Encephalartos latifrons</i>       | Albany Cycad      | Low    | Provincial distribution: Eastern Cape   | CR                  |
| <i>Encephalartos lebomboensis</i>    | Lebombo Cycad     | Low    | Provincial distribution: KwaZulu-Natal, Mpumalanga<br>Description: Cliffs and rocky ravines in savanna and grassland.                             | EN                  |
| <i>Encephalartos lehmannii</i>       | No common name    | Low    | Provincial distribution: Eastern Cape   | NT; P               |
| <i>Encephalartos longifolius</i>     | No common name    | Low    | Provincial distribution: Eastern Cape   | NT; P               |
| <i>Encephalartos middelburgensis</i> | Middelburg Cycad  | Low    | Provincial distribution: Gauteng, Mpumalanga<br>Description: Open grasslands and in sheltered valleys.  | CR                  |
| <i>Encephalartos msinganus</i>       | Msinga, Cycad     | Low    | Provincial distribution: KwaZulu-Natal  | CR                  |
| <i>Encephalartos natalensis</i>      | Natal Giant Cycad | Low    | Provincial distribution: Eastern Cape, KwaZulu-Natal  | NT; P               |
| <i>Encephalartos ngoyanus</i>        | Ngoye Dwarf Cycad | Low    | Provincial distribution: KwaZulu-Natal  | VU                  |
| <i>Encephalartos nubimontanus</i>    | Blue Cycad        | Low    | Provincial distribution: Limpopo  | EW                  |
| <i>Encephalartos paucidentatus</i>   | No common name    | Low    | Provincial distribution: Mpumalanga<br>Description: Forest, occurs on steep rocky slopes and alongside streams in deep gorges.                    | VU; P               |
| <i>Encephalartos princeps</i>        | No common name    | Low    | Provincial distribution: Eastern Cape   | VU; P               |
| <i>Encephalartos senticosus</i>      | No common name    | Low    | Provincial distribution: KwaZulu-Natal  | VU; P               |
| <i>Encephalartos transvenosus</i>    | Modjadje Cycad    | Low    | Provincial distribution: Limpopo  | LC; P               |
| <i>Encephalartos trispinosus</i>     | No common name    | Low    | Provincial distribution: Eastern Cape   | VU; P               |
| <i>Encephalartos woodii</i>          | Wood's Cycad      | Low    | Provincial distribution: KwaZulu-Natal  | EW                  |
| <i>Euphorbia clivicola</i>           | No common name    | Low    | Provincial distribution: Limpopo  | CR; P               |
| <i>Euphorbia meloformis</i>          | No common name    | Low    | Provincial distribution: Eastern Cape   | NT; P               |
| <i>Euphorbia obesa</i>               | No common name    | Low    | Provincial distribution: Eastern Cape   | EN; P               |
| <i>Harpagophytum procumbens</i>      | Devil's Claw      | Low    | Provincial distribution: Free State, Limpopo, Northern Cape, North West   | LC; P               |
| <i>Harpagophytum zeyherii</i>        | Devil's Claw      | Medium | Provincial distribution: Gauteng, Limpopo, Mpumalanga, North West   | LC; P               |
| <i>Hoodia currorii</i>               | Ghaap             | Low    | Provincial distribution: Limpopo  | P                   |
| <i>Hoodia gordonii</i>               | Ghaap             | Low    | Provincial distribution: Free State, Northern Cape, Western Cape  | DDD; P              |
| <i>Jubaeopsis caffra</i>             | Pondoland Coconut | Low    | Provincial distribution: Eastern Cape   | EN                  |



| NEMBA TOPS LIST (PLANT SPECIES)                         |                     |     |   |                     |
|---|---------------------|-----|---|---------------------|
| Scientific Name   | Common Name         | POC | Provincial Distribution   | Conservation Status |
| <i>Merwillia plumbea</i>                                | Blue Squill         | Low | Provincial distribution: KwaZulu-Natal, Mpumalanga<br>Major habitats: Grassland<br>Description: Montane mistbelt and Ngongoni grassland, rocky areas on steep, well drained slopes. 300-2500 m.   | NT                  |
| <i>Newtonia hildebrandtii</i> var. <i>hildebrandtii</i> | Lebombo Wattle      | Low | Provincial distribution: KwaZulu-Natal  | Now LC              |
| <i>Protea odorata</i>                                   | Swartland Sugarbush | Low | Provincial distribution: Western Cape   | CR; P               |
| <i>Siphonochilus aethiopicus</i>                        | Wild Ginger         | Low | Provincial distribution: KwaZulu-Natal, Limpopo, Mpumalanga<br>Range: Sporadically from the Letaba catchment in the Limpopo Lowveld to Swaziland. Extinct in KwaZulu-Natal. Widespread elsewhere in Africa.<br>Description: Tall open or closed woodland, wooded grassland or bushveld.                                 | CR                  |
| <i>Stangeria eriopus</i>                                | No common name      | Low | Provincial distribution: Eastern Cape, KwaZulu-Natal  | VU; P               |
| <i>Warburgia salutaris</i>                              | Pepper-bark Tree    | Low | Provincial distribution: KwaZulu-Natal, Limpopo, Mpumalanga<br>Range: North-eastern KwaZulu-Natal, Mpumalanga and Limpopo Province. Also occurs in Swaziland, Mozambique and Zimbabwe and Malawi.<br>Description: Variable, including coastal, riverine, dune and montane forest as well as open woodland and thickets. | EN                  |
| <i>Zantedeschia jucunda</i>                             | Yellow Arum Lilly   | Low | Provincial distribution: Limpopo  | VU                  |

CR = Critically Endangered, EN = Endangered, EW = Extinct in the Wild, NT = Near Threatened, VU = Vulnerable, P = Protected, POC = Probability of Occurrence.



## Provincially Protected Flora

**Table G2: Protected Plants (Schedule 12) for the Limpopo Province<sup>15</sup>.**

| Common name   | Scientific name                                  | POC               |
|---|--|-------------------|
| <b>Trees and Shrubs</b>   |  |                   |
| The following Adenia species  | <i>Adenia fruticosa simpliciflora</i>            | Low               |
| Baobab  | <i>Adansonia digitata</i>                        | Low               |
| Beech   | <i>Faurea macnaughtonii</i>                      | Low               |
| Bitter False Thorn  | <i>Albizia amara sericocephala</i>               | Low               |
| The following Boscia species  | <i>Boscia angustifolia</i> var. <i>corymbosa</i> | Low               |
|   | <i>Boscia foetida minima</i>                     | Low               |
| Borassus Palm   | <i>Borassus aethiopicum</i>                      | Low               |
| Brackenridgea   | <i>Brackenridgea zanguebarica</i>                | Low               |
| Capper Bush   | <i>Capparis sepiaria</i> var. <i>subglabra</i>   | Low               |
| The following Combretum species   | <i>Combretum collinum taborense</i>              | Low               |
|   | <i>Combretum padoides</i>                        | Low               |
|   | <i>Combretum petrophilum</i>                     | Low               |
|   | <i>Combretum vendae</i>                          | Low               |
| The following Commiphora species  | <i>Commiphora zanzibarica</i>                    | Low               |
| Currant   | <i>Allophylus ainifolius</i>                     | Low               |
| The following elephantorrhiza species   | <i>Elephantorrhiza praetermissa</i>              | Low               |
| The following Grewia species  | <i>Grewia rogersii</i>                           | Low               |
|   | <i>Hibiscus articulatus</i>                      | Low               |
|   | <i>Hibiscus barnardii</i>                        | Low               |
| The following Hibiscus species  | <i>Hibiscus barnardii</i>                        | Low               |
|   | <i>Hibiscus sabiensis</i>                        | Low               |
| Large Cape Myrtle   | <i>Myrsine pillansii</i>                         | Low               |
| Largeleaved Dragon Tree   | <i>Dracaena hookerana</i>                        | Low               |
| Largeleaved Saucerberry   | <i>Cordia africana</i>                           | Low               |
| The following Maytenus species  | <i>Maytenus oxycarpa</i>                         | Low               |
|   | <i>Maytenus pubescens</i>                        | Low               |
| The following Ochna species   | <i>Ochna glauca</i>                              | Low               |
| Pepperbark Tree   | <i>Warburgia salutaris</i>                       | Low               |
| Pincushion  | <i>Leucospermum saxosum</i>                      | Low               |
| The following Rhus species  | <i>Searsia batophylla</i>                        | Low               |
| Sand ironplum   | <i>Drypetes mossambicensis</i>                   | Low               |
| Salati Palm   | <i>Borassus aethiopicum</i>                      | Low               |
| Stinkwood, Black  | <i>Ocotea bullata</i>                            | Low               |
| Stinkwood, Transvaal  | <i>Ocotea kenyensis</i>                          | Low               |
| Tamboti   | <i>Spirostachys africana</i>                     | Low               |
| The following Tarenna species   | <i>Tarenna zygoon</i>                            | Low               |
| Transvaal Red Balloon   | <i>Erythrophysa transvaalensis</i>               | Low               |
| Venda Beadstring  | <i>Alchornea laxiflora</i>                       | Low               |
| Wild Banana   | <i>Ensete ventricosum</i>                        | Low               |
| Wild Teak   | <i>Pterocarpus angolensis</i>                    | Low               |
| Yellowwood, Outeniqua   | <i>Podocarpus latifolius</i>                     | Low               |
| Yellowwood, Real  | <i>Podocarpus falcatus</i>                       | Low               |
| <b>Succulents</b>   |  |                   |
| <b>All species of aloes indigenous to the Province excluding the following species:</b> |  | Low               |
| Aculeata  | <i>Aloe aculeata</i>                             | These species are |
| Aloe Catstail   | <i>Aloe castanea</i>                             |                   |

<sup>15</sup> <https://www.thetreeapp.co.za/team/>



| Common name                               | Scientific name  | POC                      |
|---|--|--------------------------|
| Aloe Krans                                | <i>Aloe arborescens</i>  | not protected under LEMA |
| Aloe Mountain                             | <i>Aloe marlothii</i>  |                          |
| Ammophilla                                | <i>Aloe ammophilla</i>   |                          |
| Davyana                                   | <i>Aloe davyana</i>  |                          |
| Fosteri                                   | <i>Aloe fosteri</i>  |                          |
| Globuligemma                              | <i>Aloe globuligemma</i>   |                          |
| Grandidentata                             | <i>Aloe grandidentata</i>  |                          |
| Greatheadii                               | <i>Aloe greatheadii</i>  |                          |
| Lutescens                                 | <i>Aloe lutescens</i>  |                          |
| Mutans                                    | <i>Aloe mutans</i>   |                          |
| Parvibracteata                            | <i>Aloe parvibracteata</i>   |                          |
| Transvaalensis                            | <i>Aloe transvaalensis</i>   |                          |
| Wickensii                                 | <i>Aloe wickensii</i>  |                          |
| All species of <i>Brachystelma</i>        | <i>Brachystelma</i> spp  |                          |
| All species of <i>Ceropegia</i>           | <i>Ceropegia</i> spp   | Low                      |
| All species of <i>Duvalia</i>             | <i>Duvalia</i> spp   | High                     |
| The following species Euphorbias:         | <i>Euphorbia barnardii</i>   | Low                      |
|   | <i>Euphorbia divicola</i>  | Low                      |
|   | <i>Euphorbia grandialata</i>   | Low                      |
|   | <i>Euphorbia groenewaldii</i>  | Low                      |
|   | <i>Euphorbia louwii</i>  | Low                      |
|   | <i>Euphorbia restricta</i>   | Low                      |
|   | <i>Euphorbia rowlandii</i>   | Low                      |
|   | <i>Euphorbia tortirama</i>   | Low                      |
|   | <i>Euphorbia waterbergensis</i>  | Low                      |
|   | Ghaap  | <i>Hoodia lugardii</i>   |
| All species of Ghaap                      | <i>Tavaresia</i> spp   | Low                      |
| All species of Huernia                    | <i>Huernia</i> spp   | Confirmed                |
| All species of Huerniopsis                | <i>Huerniopsis</i> spp   | Low                      |
| The following Impala Lilies               | <i>Adenium multiflorum</i>   | Low                      |
| Multiflorum en Oleifolium                 | <i>Adenium oleifolium</i>  | Low                      |
| Kudu Lily                                 | <i>Pachypodium saundersii</i>  | Low                      |
| All species of <i>Orbeanthus</i>          | <i>Orbeanthus</i> spp  | Low                      |
| All species of <i>Orbea</i>               | <i>Orbea</i> spp   | Low                      |
| All species of <i>Orbeopsis</i>           | <i>Orbeopsis</i> spp   | Low                      |
| All species of <i>Pachycymbiums</i>       | <i>Pachycymbium</i> spp  | Low                      |
| All species of <i>Riocreuxias</i>         | <i>Riocreuxia</i> spp  | Low                      |
| All species of Stapeliads                 | <i>Stapelia</i> spp  | High                     |
| Stone Plant                               | <i>Lithops leslieii</i>  | Low                      |
| <b>Other Plants</b>                       |  |                          |
| The following <i>Agapanthus</i> species   | <i>Agapanthus coddii</i> , <i>A. dyeri</i>                               | Low                      |
| The following <i>Anacampseros</i> species | <i>Anacampseros bemenkampii</i> (now <i>A. rhodesica</i> )               | Low                      |
| All species of <i>Anomatheca</i>          | <i>Anomatheca</i> spp  | Low                      |
| The following <i>Anthericum</i> species   | <i>Anthericum cyperaceum</i>   | Low                      |
| The following Arum Lilies:                |  | Low                      |
| Jucunda, Pentlandii and Rehmarii          | <i>Zantedeschia jucunda</i> , <i>Z. pentlandii</i> , <i>Z. rehmannii</i> | Low                      |
| The following Babiana Species             | <i>Babiana hypogaea</i> var. <i>longituba</i>                            | Low                      |
| <i>Batesiana Gasteria</i>                 | <i>Gasteria batesiana</i>  | Low                      |
| Blue Squill                               | <i>Scilla natalensis</i>   | Low                      |
| Clivia                                    | <i>Clivia caulescens</i>   | Low                      |



| Common name                                | Scientific name                              | POC    |
|--|--|--------|
| The following <i>Cyathula</i> species      | <i>Cyathula natalensis</i>                   | Low    |
| The following <i>Eragrostis</i> species    | <i>Eragrostis arenicola</i>                  | Low    |
| The following <i>Eriosema</i> species      | <i>Eriosema transvaalense</i>                | Low    |
| The following <i>Eulophia</i> species      | <i>Eulophia coddii</i>                       | Low    |
|  | <i>Eulophia leachii</i>                      | Low    |
| The following <i>Felicia</i> species       | <i>Felicia fruticosa brevipendunculata</i>   | Low    |
| The following <i>Festuca</i> species       | <i>Festuca dracomontana</i>                  | Low    |
| All species of Fire Lily                   | <i>Cyrtanthus spp</i>                        | Low    |
| The following <i>Freylinia</i> species     | <i>Freylinia tropica</i>                     | Low    |
| The following <i>Gladiolus</i> species     | <i>Gladiolus macneilii</i>                   | Low    |
| The following <i>Habernaria</i> species    | <i>Habernaria kraenzliniana</i>              | Low    |
| The following <i>Heinsia</i> species       | <i>Heinsia crinita</i>                       | Low    |
| The following <i>Hermstaedtia</i> species  | <i>Hermstaedtia capitata</i>                 | Low    |
| The following <i>Hippocratea</i> species   | <i>Hippocratea parvifolia</i>                | Low    |
| The following <i>Hymenodictyon</i> species | <i>Hymenodictyon parvifolium parvifolium</i> | Low    |
| The following <i>Hyptis</i> species        | <i>Hyptis spicigera</i>                      | Low    |
| The following <i>Inula</i> species         | <i>Inula paniculata</i>                      | Low    |
| The following <i>Jasminum</i> species      | <i>Jasminum abyssinicum</i>                  | Low    |
| The following <i>Kalanchoe</i> species     | <i>Kalanchoe crundallii</i>                  | Low    |
|  | <i>Kalanchoe rogersii</i>                    | Low    |
| The following <i>Kniphofia</i> species     | <i>Kniphofia coralligemma</i>                | Low    |
|  | <i>Kniphofia crassifolia</i>                 | Low    |
|  | <i>Kniphofia rigidifolia</i>                 | Low    |
| The following <i>Kotschya</i> species      | <i>Kotschya thymodora</i>                    | Low    |
| The following <i>Melinis</i> species       | <i>Melinis tenuissima</i>                    | Low    |
| The following <i>Mondia</i> species        | <i>Mondia whitei</i>                         | Low    |
| The following <i>Monsonia</i> species      | <i>Monsonia lanuginosa</i>                   | Low    |
| The following <i>Neobulosia</i> species    | <i>Neobulosia tysonii</i>                    | Low    |
| The following <i>Nervillia</i> species     | <i>Nervillia umbrosa</i>                     | Low    |
| The following <i>Nymphaea</i> species      | <i>Nymphaea lotus</i>                        | Low    |
| The following <i>Oberonia</i> species      | <i>Oberonia distichia</i>                    | Low    |
| The following <i>Oreosyce</i> species      | <i>Oreosyce africana</i>                     | Low    |
| Paint Brush                                | <i>Haemanthus montanus</i>                   | Low    |
|  | <i>Peristrophe cliffordii</i>                | Low    |
| The following <i>Peristrophe</i> species   | <i>Peristrophe gililandorum</i>              | Low    |
|  | <i>Peristrophe transvaalensis</i>            | Low    |
| The following <i>Phyllanthus</i> species   | <i>Phyllanthus pinnatus</i>                  | Low    |
| The following <i>Pilea</i> species         | <i>Pilea rivularis</i>                       | Low    |
| The following <i>Plinthus</i> species      | <i>Plinthus rehmannii</i>                    | Low    |
| The following <i>Polycarpea</i> species    | <i>Polycarpea eriantha var. effusa</i>       | Low    |
| The following <i>Polystachya</i> species   | <i>Polystachya albescens imbricata</i>       | Low    |
| The following <i>Portulaca</i> species     | <i>Portulaca foliosa</i>                     | Low    |
|  | <i>Portulaca trianthemoides</i>              | Low    |
| The following <i>Rhyncosia</i> species     | <i>Rhyncosia vendae</i>                      | Low    |
| Royal Paint Brush (Blood lily)             | <i>Scadoxys puniceus</i>                     | Medium |
| The following <i>Sartidia</i> species      | <i>Sartidia jucunda</i>                      | Low    |
| The following <i>Schizagyrium</i> species  | <i>Schizagyrium brevifolium</i>              | Low    |
| All species of South African Orchid        | Family Orchidaceae                           | Low    |
| The following <i>Stadmania</i> species     | <i>Stadmania oppositifolia</i>               | Low    |
| The following <i>Streptocarpus</i> species | <i>Streptocarpus decipiens</i>               | Low    |





| Common name                               | Scientific name                                       | POC |
|---|---|-----|
| The following <i>Strophanthus</i> species | <i>Strophanthus luteolus</i>                          | Low |
| The following <i>Sutera</i> species       | <i>Sutera maerantha</i>                               | Low |
| The following <i>Thorncroftia</i> species | <i>Thorncroftia media</i>                             | Low |
| All species of Tree Ferns                 | <i>Cyathea spp</i>                                    | Low |
| All species of Tree Moss                  | <i>Porothamnium, Pilotrichella and Papillaria spp</i> | Low |
| The following <i>Trilepisium</i> species  | <i>Trilepisium madagascariensis</i>                   | Low |
| The following <i>Tristachya</i> species   | <i>Tristachya trifaria</i>                            | Low |
| The following <i>Turbina</i> species      | <i>Turbina shirensis</i>                              | Low |
|   | <i>Watsonia densiflora</i>                            | Low |
| The following <i>Watsonia</i> species     | <i>Watsonia transvaalensis</i>                        | Low |
|   | <i>Watsonia wilmsii</i>                               | Low |
| Wild Ginger                               | <i>Burmanna madagascariensis</i>                      | Low |
| Wild Ginger                               | <i>Siphonochilus aethiopicus</i>                      | Low |
| The following <i>Xylopia</i> species      | <i>Xylopia parviflora</i>                             | Low |

**Table G3: NFA plant list for species with a known distribution range falling within the study area<sup>16</sup>.**

| SCIENTIFIC NAME                                       | Habitat & Distribution <sup>17</sup> & <sup>18</sup>  | National Red List Status | POC       |
|---|---|--------------------------|-----------|
| <b><i>Boscia albitrunca</i></b>                       | Habitat mainly includes dry, open woodland and bushveld, mostly in hot, arid, semi-desert areas, often on termitaria. The vast distribution range covers Botswana, Limpopo, Gauteng, North-West, Swaziland, the Free State, Northern Cape, and KwaZulu-Natal. It also extends into Zambia, Zimbabwe, and Mozambique.  | LC<br>P                  | Medium    |
| <b><i>Combretum imberbe</i></b>                       | The leadwood can be found in all the bushveld regions and in mixed forest in southern Africa. Preferred habitat includes open bushveld, mixed woodland, rivers or dry watercourses and often on alluvial soils. It is widespread in Lowveld areas and grows along streams and rivers. <i>Combretum imberbe</i> is widespread in northern Namibia. It is also found in Mpumalanga, Limpopo, North-West Province, Mozambique, and into tropical Africa. | LC<br>P                  | Confirmed |
| <b><i>Catha edulis</i></b>                            | Khat is found in woodlands and on rocky outcrops. It is scattered in KwaZulu-Natal and Eastern Cape, mostly from the mistbelt, moving inland. It is also found in the Western Cape, Mpumalanga, Swaziland, Mozambique and through to tropical Africa and the Arab countries.  | LC<br>P                  | Low       |
| <b><i>Elaeodendron transvaalense</i></b>              | Savanna or bushveld, from open woodland to thickets, often on termite mounds.   | NT<br>P                  | Medium    |
| <b><i>Sclerocarya birrea</i> subsp. <i>caffra</i></b> | The Marula is widespread in Africa from Ethiopia in the north to KwaZulu-Natal in the south. In South Africa it is more dominant in the Baphalaborwa area in Limpopo. It occurs naturally in various types of woodland, on sandy soil or occasionally sandy loam.   | LC<br>P                  | Confirmed |
| <b><i>Philenoptera violacea</i></b>                   | Alluvial flats in bushveld  | LC<br>P                  | Low       |
| <b><i>Pittosporum viridiflorum</i></b>                | <i>Pittosporum viridiflorum</i> is widely distributed in the eastern half of South Africa, occurring from the Western Cape up into tropical Africa and beyond to Arabia and India. It grows over a wide range of altitudes and varies in form from one location to another. <i>Pittosporum viridiflorum</i> grows in tall forest and in scrub on the forest margin, kloofs and on-stream banks.   | LC<br>P                  | Low       |
| <b><i>Prunus africana</i></b>                         | <i>Prunus africana</i> is confined to evergreen forests from near the coast to the mist belt and montane forests in KwaZulu-Natal, Eastern Cape, Swaziland, Mpumalanga, Zimbabwe, and tropical Africa. This It is a moderately fast-growing tree which is sensitive to heavy frost, preferring areas where there is regular rain; it will tolerate moderate frosts.   | VU<br>P                  | Low       |

<sup>16</sup> <https://www.thetreeapp.co.za/team/>

<sup>17</sup> <http://pza.sanbi.org/>

<sup>18</sup> <http://redlist.sanbi.org/index.php>



| SCIENTIFIC NAME                    | Habitat & Distribution <sup>17</sup> & <sup>18</sup>   | National Red List Status | POC |
|------------------------------------|--|--------------------------|-----|
| <i>Vachellia erioloba</i>          | Found in dry woodland, bushveld, grassland, and watercourses in arid areas usually on stony or sandy soil. Widespread in the arid northern provinces of South Africa, also Namibia, Botswana, Zimbabwe, southern Angola, and south-western Zambia.   | LC<br>P                  | Low |
| <i>Erythrophysa transvaalensis</i> | This species has a limited distribution in South Africa occurring in Gauteng, Limpopo, and the North West Province. It grows in a few places in western Gauteng, on the slope of a hill near the Bospoort Dam in the Rustenburg District, near Thabazimbi, and in the western Waterberg. It was first thought to be endemic to syenite hills (koppies) in the Pilanesberg Nature Reserve, but it has been found since in a wider area (Balkwill 1994). I.C. Verdoorn (1942) described one of the original collections as coming from a norite koppie (near Bosport Dam). It also occurs in Limpopo in a few areas including near the Strydom tunnel on dolomite (Pieter Winter pers. comm.). It has also been collected in Zimbabwe. | LC<br>P                  | Low |
| <i>Securidaca longepedunculata</i> | It occurs in the North-West and Limpopo provinces of South Africa, in Mozambique and is widely distributed in tropical Africa. The violet tree is found in woodland and arid savanna soils.  | LC<br>P                  | Low |
| <i>Podocarpus latifolius</i>       | The real yellowwood grows naturally in mountainous areas and forests in the southern, eastern and northern parts of South Africa, extending into Zimbabwe and further north. It is also found on rocky hillsides and mountain slopes but does not get as tall where it is exposed as it does in the forest.  | LC<br>P                  | Low |

CR= Critically Endangered, EN = Endangered, LC = Least Concern; NT = Near Threatened, P= Protected, POC = Probability of Occurrence; R = Rare



## APPENDIX H: Declaration and Specialists CV's

### 1. (a) (i) Details of the specialist who prepared the report

Samantha-Leigh Daniels  
Christien Steyn

PhD Candidate Plant Science (University of Pretoria)  
MSc Plant Science (University of Pretoria)

### 1. (A). (ii) The expertise of that specialist to compile a specialist report including a curriculum vitae

|                             |   |      |                            |
|-----------------------------|---|------|----------------------------|
| Company of Specialist:      | Scientific Terrestrial Services   |      |                            |
| Name / Contact person:      | Christien Steyn   |      |                            |
| Postal address:             | 29 Arterial Road West, Oriel, Bedfordview   |      |                            |
| Postal code:                | 1401  | Fax: | 011 615 6240/ 086 724 3132 |
| Telephone:                  | 011 616 7893  |      |                            |
| E-mail:                     | <a href="mailto:christien@sasenvgroup.co.za">christien@sasenvgroup.co.za</a>  |      |                            |
| Qualifications              | MSc Plant Science (University of Pretoria)<br>BSc (Hons) (Plant Science) (University of Pretoria)<br>BSc (environmental Science) (University of Pretoria)   |      |                            |
| Registration / Associations | Professional member of the South African Council for Natural Scientific Professions (SACNASP – Reg No. 127823/21)<br>Member of the Botanical Society of South Africa (BotSoc)<br>Member of the Grassland Society of South Africa (GSSA)<br>Member of the Land Rehabilitation Society of Southern Africa (LARSSA)<br>Member of the South African Association of Botanists (SAAB) |      |                            |

### 1. (b) a declaration that the specialist is independent in a form as may be specified by the competent authority

I, Samantha-Leigh Daniels, declare that -

- I act as the **independent specialist** in this application;
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;
- I declare that there are no circumstances that may compromise my objectivity in performing such work;
- I have expertise in conducting the specialist report relevant to this application, including knowledge of the relevant legislation and any guidelines that have relevance to the proposed activity;
- I will comply with the applicable legislation;
- I have not, and will not engage in, conflicting interests in the undertaking of the activity;
- I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing - any decision to be taken with respect to the application by the competent authority; and - the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
- All the particulars furnished by me in this form are true and correct.



Signature of the Specialist



I, Christien Steyn, declare that -

- I act as the **independent specialist (reviewer)** in this application;
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;
- I declare that there are no circumstances that may compromise my objectivity in performing such work;
- I have expertise in conducting the specialist report relevant to this application, including knowledge of the relevant legislation and any guidelines that have relevance to the proposed activity;
- I will comply with the applicable legislation;
- I have not, and will not engage in, conflicting interests in the undertaking of the activity;
- I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing - any decision to be taken with respect to the application by the competent authority; and - the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
- All the particulars furnished by me in this form are true and correct.



-----  
Signature of the Specialist





**SAS ENVIRONMENTAL GROUP OF COMPANIES –  
SPECIALIST CONSULTANT INFORMATION**

**CURRICULUM VITAE OF SAMANTHA-LEIGH DANIELS**

**PERSONAL DETAILS**

|   |                         |
|---|-------------------------|
| Position in Company                         | Junior Floral Ecologist |
| Joined SAS Environmental Group of Companies | 2020                    |

**MEMBERSHIP IN PROFESSIONAL SOCIETIES**

Member of the South African Association of Botanists (SAAB)  
 Member of the Botanical Society of South Africa (BotSoc)  
 Member of the Association for Tropical Biology and Conservation (ATBC)

**EDUCATION**

**Qualifications**

|  |         |
|--|---------|
| PhD (Plant Science) (University of Pretoria)             | Present |
| MSc (Plant Science) (University of Pretoria)             | 2017    |
| BSc (Hons) Zoology & Entomology (University of Pretoria) | 2014    |
| BSc Zoology & Entomology (University of Pretoria)        | 2013    |

**AREAS OF WORK EXPERIENCE**

**South Africa** – Gauteng, Mpumalanga, North West, Limpopo, KwaZulu-Natal, Free State

**KEY SPECIALIST DISCIPLINES**

**Biodiversity Assessments**

- Terrestrial Ecological and Biodiversity Scoping Assessments
- Terrestrial Ecological and Biodiversity Screening Assessments
- Floral Assessments
- Alien and Invasive Control Plan (AICP)
- Terrestrial Monitoring
- Desktop Studies, Mapping and Background Information Research

**Training**

- Plant species identification
- Herbarium usage and protocols





## SAS ENVIRONMENTAL GROUP OF COMPANIES – SPECIALIST CONSULTANT INFORMATION

### CURRICULUM VITAE OF **CHRISTIEN STEYN**

#### PERSONAL DETAILS

|   |                  |
|---|------------------|
| Position in Company                         | Floral Ecologist |
| Joined SAS Environmental Group of Companies | 2018             |

#### MEMBERSHIP IN PROFESSIONAL SOCIETIES

Professional member of the South African Council for Natural Scientific Professions (SACNASP – Reg No. 127823/21)  
 Member of the Botanical Society of South Africa (BotSoc)  
 Member of the Grassland Society of South Africa (GSSA)  
 Member of the Land Rehabilitation Society of Southern Africa (LARSSA)  
 Member of the South African Association of Botanists (SAAB)

#### EDUCATION

##### Qualifications

|  |      |
|--|------|
| MSc Plant Science (University of Pretoria)                           | 2017 |
| BSc (Hons) Plant Science (Invasion Biology) (University of Pretoria) | 2014 |
| BSc Environmental Science (University of Pretoria)                   | 2013 |

##### Short courses and Training

- Advanced Grass Identification Course
- Practical Plant Identification, including Herbarium Usage and Protocols
- Vegetation Classification and Mapping: Use of Geographic Information System for understanding vegetation pattern and biodiversity conservation.
- Introduction to Statistics for Biologists: Applications of plant ecology principles in plant conservation, i.e., species distribution modelling, alien plant invasions, conservation planning
- International Plant Functional Trait Course: Hands-on, field-based exploration of plant functional traits, along with experience in the usage of plant traits data in climate-change research and ecosystem ecology. <https://www.uib.no/en/rg/EECRG/97477/plant-functional-traits-course-2>

#### AREAS OF WORK EXPERIENCE

South Africa – Gauteng, Mpumalanga, North West, Limpopo, KwaZulu-Natal, Northern Cape, Free State

#### KEY SPECIALIST DISCIPLINES

##### Biodiversity Assessments

- Terrestrial Ecological and Biodiversity Scoping Assessments
- Terrestrial Ecological and Biodiversity Screening Assessments
- Floral Assessments
- Input into Terrestrial Rehabilitation Plan design with the focus on the re-establishment of vegetation
- Floral Rescue and Relocation Plans
- Alien and Invasive Plant Control and Management Plans (AIPCPs)
- Alien and Invasive Plant Identification and awareness training
- Terrestrial Monitoring
- Protected Tree and Floral Marking and Reporting
- Desktop Studies, Mapping and Background Information Research

