



## **TERRESTRIAL BIODIVERSITY COMPLIANCE STATEMENT FOR THE PROPOSED RUIGTEVLEY QUARRY PROJECT**

**Thabazimbi Local Municipality, Waterberg District  
Municipality, Limpopo Province, South Africa**

3 June 2025

**Prepared by:**

**The Biodiversity Company**




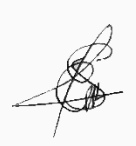
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|--|---|--|
| <b>Report Name</b>                           | <b>TERRESTRIAL BIODIVERSITY COMPLIANCE STATEMENT FOR THE PROPOSED RUIGTEVLEY QUARRY PROJECT</b>   |  |
| <b>Specialist Theme</b>                      | Terrestrial Biodiversity Compliance Statement   |  |
| <b>Project Reference</b>                     | Ruigtevley Quarry   |  |
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| <b>Declaration</b>                           | <p>The Biodiversity Company and its associates operate as independent consultants under the auspice of the South African Council for Natural Scientific Professions. We declare that we have no affiliation with or vested financial interests in the proponent, other than for work performed under the Environmental Impact Assessment Regulations, Amended. We have no conflicting interests in the undertaking of this activity and have no interests in secondary developments resulting from the authorisation of this project. We have no vested interest in the project, other than to provide a professional service within the constraints of the project (timing, time and budget) based on the principals of science.</p> |  |



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## 1 Introduction

### 1.1 Background

The Biodiversity Company (TBC) was appointed to undertake a terrestrial biodiversity baseline assessment for the proposed Ruigtevley Quarry Project near Thabazimbi, Limpopo Province. The assessment area, which included the proposed Mining Permit Area and the Stockpile Area, will be referred to as the Project Area of Influence (PAOI) for reporting purposes. A map presenting the regional context of the PAOI can be seen in Figure 1-1 and a map presenting the PAOI can be seen in Figure 1-2.

To determine the baseline ecological state of the area and to present a detailed description of the receiving environment, both a desktop assessment, as well as a field survey on the 26<sup>th</sup> of September 2024, were conducted. Furthermore, the desktop assessment and field survey both involved the detection, identification and description of any locally relevant sensitive receptors and habitats. The manner in which these sensitive features may be affected by the proposed development was also investigated.

This assessment was conducted in accordance with the amendments to the Environmental Impact Assessment Regulations, 2014 (GNR 326, 7 April 2017) of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA). The approach has taken cognisance of the recently published Government Notices (GN) 320 (20 March 2020) and GN 1150 (30 October 2020) in terms of NEMA, dated 20 March and 30 October 2020: "Procedures for the Assessment and Minimum Criteria for Reporting on Identified Environmental Themes in terms of Sections 24(5)(a) and (h) and 44 of the National Environmental Management Act, 1998, when applying for Environmental Authorisation" (Reporting Criteria). The National Web-based Environmental Screening Tool has characterised the terrestrial theme sensitivity of the PAOI as:

- Terrestrial Biodiversity Theme sensitivity is Very High;
- Plant Species Theme sensitivity is Low; and
- Animal Species Theme sensitivity is High.

The purpose of conducting the specialist study is to provide relevant input into the Environmental Authorisation application process, with a focus on the proposed activities and their impacts associated with the project. This report, after taking into consideration the findings and recommendations provided by the specialist herein, should inform and guide the Registered Environmental Assessment Practitioner (EAP) and regulatory authorities, enabling informed decision making as to the ecological viability of the proposed project.







## 1.2 Project Description

The following information is as provided by Greenmined (2024):

Inzalo Crushing and Aggregates (Pty) Ltd (hereinafter referred to as “the Applicant”) intends to apply for a mining permit to mine stone aggregate/ gravel on a portion of Portion 1 of Farm Ruigtevley 97 KQ, Thabazimbi Local Municipality, Limpopo Province.

The proposed mining footprint will be 4.9 ha and will be developed over an undisturbed area of the farm. The mining method will make use of blasting in order to loosen the hard rock; the material will then be loaded and hauled to the crushing plant where it will be screened to various-sized stockpiles. The aggregate will be stockpiled until it is transported from the site using tipper trucks. All mining-related activities will be contained within the approved mining permit boundaries.

The proposed mining area is approximately 4.9 ha in extent and the applicant, Inzalo Crushing and Aggregates (Pty) Ltd, intends to win material from the area for at least 2 years, with a possible extension of another 3 years. The aggregate to be removed from the quarry will be used for local construction and building projects in the vicinity. The proposed quarry will therefore contribute to the upgrading/maintenance of road infrastructure and building contracts in and around the surrounding areas.

The mining activities will consist of the following:

- Stripping and stockpiling of topsoil;
- Blasting;
- Excavating;
- Crushing;
- Stockpiling and transporting;
- Sloping and landscaping upon closure of the site; and
- Replacing the topsoil and re-vegetation of the disturbed area.

The mining site will contain the following:

- Drilling equipment;
- Excavating equipment;
- Earth-moving equipment;
- Static crushing and screening plants; and
- Access roads.

## 1.3 Scope of Work

The aim of the biodiversity assessment was to provide information to guide the risk of the proposed activity to the current state of the associated ecosystems within the development area. This was achieved through the following:



- Desktop assessment to identify the ecologically important features within the landscape comprising of terrestrial features;
- Desktop assessment to identify possible Species of Conservation Concern (SCC) that occur within the landscape;
- Field survey to record flora and fauna species, especially Species of Conservation Concern (SCC);
- Determination of the Site Ecological Importance (SEI), also commonly referred to as sensitivity; and
- The prescription of mitigation measures for identified risks.

#### **1.4 Assumptions and Limitations**

The following assumptions and limitations are applicable for this assessment:

- It is assumed that all information received from the client and landowner is accurate;
- All datasets accessed and utilised for this assessment are considered to be representative of the most recent and suitable data for the intended purposes;
- The assessment area (PAOI) was based on the footprint areas as provided by the client, and any alterations to the area and/or missing GIS information pertaining to the assessment area would have affected the area surveyed and hence the results of this assessment;
- The area was surveyed during a single site visit, therefore, this assessment does not consider temporal trends (note that the data collected is considered sufficient to derive a meaningful baseline);
- The single site visit was conducted during the early wet season, however conditions on site were still very dry, and this means that certain flora and fauna would not have been present or observable due to seasonal constraints;
- Whilst every effort was made to cover as much of the PAOI as possible, representative sampling was completed, and by its nature it is possible that some plant and animal species that are present within the PAOI were not recorded during the field investigations;
- This report must be considered in conjunction with the accompanying freshwater report (TBC, 2024); and
- The GPS used in the assessment has an accuracy of 5 m and consequently any spatial features may be offset by up to 5 m.

#### **1.5 Legislative Framework**

In line with the protocol for the specialist assessment and minimum report content requirements for environmental impacts on terrestrial biodiversity, as per Government Notice 320 published in terms of NEMA, dated 20 March 2020: "Procedures for the Assessment and Minimum Criteria for Reporting on Identified Environmental Themes in terms of Sections 24(5)(a) and (h) and 44 of the National Environmental Management Act, 1998, when applying for Environmental Authorisation" – section 3, subsection 1:



- An applicant intending to undertake an activity identified in the scope of the protocol, on a site identified on the screening tool as being of 'Very High' sensitivity for terrestrial biodiversity, must submit a Terrestrial Biodiversity Specialist Assessment; however
- Where the information gathered from the site sensitivity verification differs from the designation of 'Very High' terrestrial biodiversity sensitivity on the screening tool and it is found to be of a 'Low' sensitivity, then a Terrestrial Biodiversity Compliance Statement must be submitted.

The information obtained from a site sensitivity verification, which involved both a desktop assessment as well as a field survey, confirmed that the proposed PAOI is of a 'Low' sensitivity. Therefore, this report constitutes a Terrestrial Biodiversity Compliance Statement.

As per sections 2 and 3 of the protocol discussed above, a Terrestrial Biodiversity Compliance Statement must contain the information as presented in Table 1-1 below.

**Table 1-1** *Terrestrial Biodiversity Compliance Statement information requirements as per the relevant protocol, including the location of the information within this report*

| Information to be Included (as per GN 320, 20 March 2020)   | Report Section |
|---|----------------|
| Methodology used to undertake the site assessment and survey, and prepare the compliance statement, including relevant equipment and modelling used               | 7.1            |
| Description of the assumptions and any uncertainties or gaps in knowledge or data   | 1.4            |
| A baseline profile description of biodiversity and ecosystems of the site   | 2.1            |
| Site sensitivity verification: Desktop Analysis using satellite imagery and available information   | 3.1            |
| A statement on the duration, date and season of the site inspection   | 3.2            |
| Site sensitivity verification: Onsite inspection, include a description of current land use and vegetation found on-site  | 3.2            |
| Site sensitivity verification: Photographs/evidence of environmental sensitivity  | 3.2            |
| Screening tool confirmation/dispute: The assessment must verify the "low" sensitivity of the site, in terms of plant, animal, and terrestrial biodiversity themes | 3.4.2          |
| Proposed impact management outcomes or monitoring requirements for inclusion in the EMPr  | 4              |
| Indicate whether or not the proposed development will have any impact on the terrestrial environment, animals and/or plants                                       | 5              |
| A signed statement of independence by the specialist  | 7.3            |
| Specialist details, including a CV  | 7.4            |

A signed copy of the compliance statement must be appended to the Basic Assessment Report or Environmental Impact Assessment Report.

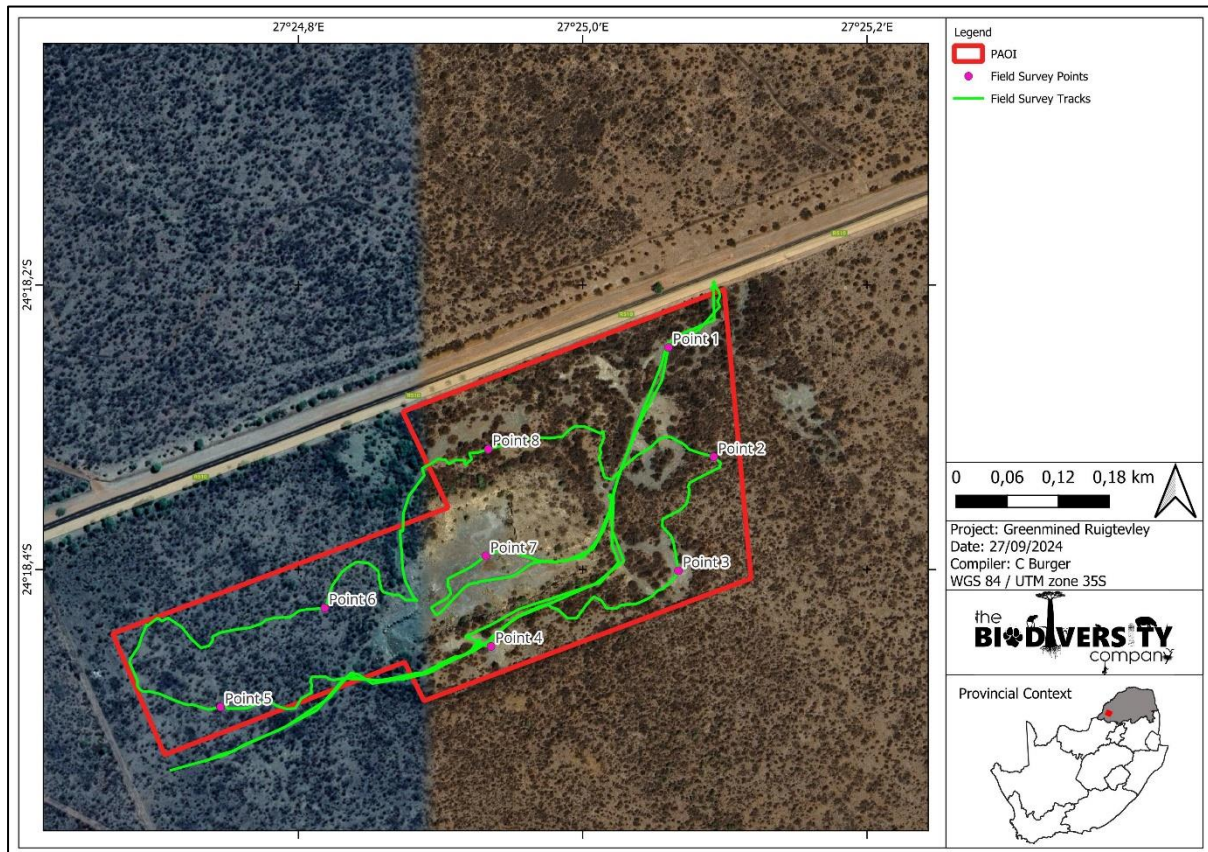


## 2 Fieldwork

### 2.1 Biodiversity Field Assessment

A single season field survey was undertaken on the 26<sup>th</sup> of September 2024, which constitutes an early wet season survey (however conditions on site were still very dry), to determine the presence of any local SCC and to achieve the delineation of local habitat types and their associated sensitivities. Effort was made to cover all the different habitat types within the PAOI, within the limits of time, access and security. This site visit is considered sufficient for the project (Figure 2-1).

Based on historical imagery, it was determined that significant portions of the PAOI have previously been subjected to mining activities. Refer to Figure 2-2 for an illustration depicting the historic mining activities that have been present since 1984.



**Figure 2-1** Map illustrating the field tracks of the field survey





**Figure 2-2**      *Image from 1984<sup>1</sup> indicating the signs of historical mining*

<sup>1</sup> [http://cdngiportal.co.za/photocentres/50K\\_PAN/874\\_Dwaalboom/874\\_009\\_04095.jpg](http://cdngiportal.co.za/photocentres/50K_PAN/874_Dwaalboom/874_009_04095.jpg)



### 3 Results & Discussion

#### 3.1 Ecologically Important Landscape Features

Table 3-1 below has been produced as a result of the spatial data collected and analysed as provided by relevant sources. It presents a summative breakdown of the ecological boundaries considered and the associated relevance that each has to the region or PAOI.

**Table 3-1 Summary of relevance of the proposed project to ecologically important landscape features**

| Desktop Information Considered   | Relevance  | Reasoning   |
|--|------------|---|
| Ecosystem Threat Status  | Relevant   | Overlaps with an 'Least Concern' Ecosystem (Red List of Ecosystems) RLE, 2021)  |
| Ecosystem Protection Level   | Relevant   | Overlaps with a 'Well Protected' Ecosystem  |
| Provincial Conservation Plan   | Relevant   | Overlaps with an Ecological Support Area (ESA) and a small portion of Critical Biodiversity Area (CBA) 2  |
| South Africa Protected Areas Database (SAPAD) and South Africa Conservation Areas Database (SACAD) | Relevant   | Occurs within 5 km of the Jan Kloppers Private Nature Reserve (2.7 km) and Marakele National Park (4 km) and 8.5 km from the Waterberg Biosphere Reserve. |
| National Protected Areas Expansion Strategy (NPAES)  | Irrelevant | Does not overlap with any relevant areas (NPAES, 2018)  |
| Key Biodiversity Areas (KBA)   | Relevant   | Occurs within 10 km of the Waterberg Biosphere Reserve KBA (8.5 km)   |
| South African Inventory of Inland Aquatic Ecosystems (SAIIAE)                                      | Irrelevant | The PAOI and its 500 m regulated area does not overlap with any SAIIAE wetlands   |
| National Freshwater Priority Area (NFEPA)  | Irrelevant | The PAOI and its 500 m regulated area does not overlap with any NFEPA wetlands  |
| Strategic Water Source Area (SWSA)   | Irrelevant | Does not overlap with any relevant areas  |

##### 3.1.1 Expected Alien and Invasive Plant Species

Alien Invasive Plants (IAPs) tend to dominate or replace indigenous flora, thereby transforming the structure, composition and functioning of ecosystems. Therefore, it is important that these plants are controlled by means of an eradication and monitoring programme. Some invader plants may also degrade ecosystems through superior competitive capabilities to exclude native plant species.

These species are listed under the Alien and Invasive Species List 2020, Government Gazette No. GN1003 as Category 1b and Not Indigenous (Exotic) respectively. The POSA database indicates that seventeen (17) AIP species are expected to occur within the area where five (5) species in green (Table 3-2), are AIP species that must be controlled by implementing an AIP Management Programme, in compliance of section 75 of the National Environmental Management: Biodiversity Act (NEMBA), as stated above.

**Table 3-2 Summary of AIP recorded within the PAOI of Influence (PAOI) during the field survey period.**

| Family                  | Scientific Name               | Alien Category                        |
|-------------------------|-------------------------------|---------------------------------------|
| <b>Amaranthaceae</b>    | <i>Alternanthera sessilis</i> | Not indigenous; Naturalised; Invasive |
| <b>Amaranthaceae</b>    | <i>Gomphrena celosioides</i>  | Not indigenous; Naturalised           |
| <b>Amaranthaceae</b>    | <i>Guilleminea densa</i>      | Not indigenous; Naturalised; Invasive |
| <b>Aristolochiaceae</b> | <i>Aristolochia elegans</i>   | Not indigenous; Naturalised; Invasive |






| Family          | Scientific Name                   | Alien Category                        |
|-----------------|-----------------------------------|---------------------------------------|
| Asteraceae      | <i>Ageratum houstonianum</i>      | NEMBA Category 1b.                    |
| Asteraceae      | <i>Coreopsis lanceolata</i>       | NEMBA Category 1b.                    |
| Asteraceae      | <i>Schkuhria pinnata</i>          | Not indigenous; Naturalised           |
| Caryophyllaceae | <i>Polycarpaea corymbosa</i>      | Not indigenous; Naturalised           |
| Fabaceae        | <i>Senna occidentalis</i>         | NEMBA Category 1b.                    |
| Lamiaceae       | <i>Salvia coccinea</i>            | Not indigenous; Naturalised           |
| Lamiaceae       | <i>Salvia reflexa</i>             | Not indigenous; Naturalised; Invasive |
| Malvaceae       | <i>Malvastrum coromandelianum</i> | NEMBA Category 1b.                    |
| Onagraceae      | <i>Ludwigia palustris</i>         | Not indigenous; Naturalised           |
| Poaceae         | <i>Eragrostis barrelieri</i>      | Not indigenous; Naturalised           |
| Poaceae         | <i>Sorghum halepense</i>          | NEMBA Category 2                      |
| Rubiaceae       | <i>Richardia brasiliensis</i>     | Not indigenous; Naturalised           |
| Verbenaceae     | <i>Verbena bonariensis</i>        | NEMBA Category 1b.                    |



### 3.2 Biodiversity Field Survey

The following sections discuss the results from the field survey that was conducted for the proposed project, which was undertaken on the 26<sup>th</sup> of September 2024. Each sample point is described in Table 3-3.




**Table 3-3**      ***Sensitivity summary of the survey points and habitat types delineated within the PAOI***

| Survey Point  | Description  | SEI                 | Photographs  |
|---|--|---------------------|--|
| <p>Site GPS<br/>Reference:<br/>Point 2<br/>Date:<br/>26/09/2024<br/>GPS<br/>Coordinates:<br/>24°18'17.32"S<br/>27°25'6.18"E</p>   | <p><b>Modified</b><br/>The modified areas have little to no remaining natural vegetation due to land transformation by historic mining activities, roads, and mismanagement. No fauna or flora SCC observed, and none expected for the habitat unit.</p> | <p>Very<br/>Low</p> |   |
| <p>Site GPS<br/>Reference:<br/>Marker 4<br/>Date:<br/>26/09/2024<br/>GPS<br/>Coordinates:<br/>24°18'24.52"S<br/>27°24'57.72"E</p> | <p><b>Modified</b><br/>The modified areas have little to no remaining natural vegetation due to land transformation by historic mining activities, roads, and mismanagement. No fauna or flora SCC observed, and none expected for the habitat unit.</p> | <p>Very<br/>Low</p> |    |




| Survey Point   | Description  | SEI | Photographs   |
|--|--|-----|---|
|  |  |     |   |
| Site GPS<br>Reference:<br>Marker 5<br>Date:<br>26/09/2024<br>GPS<br>Coordinates:<br>24°18'26.82"S<br>27°24'47.44"E | <p><b>Degraded Western Sandy Bushveld</b></p> <p>The Degraded Western Sandy Bushveld habitat unit features large tree species along with tall shrubs and grasses. Although it is semi-natural bushveld, it has been disturbed by past mining activities, overgrazing, and road construction. These disturbances have reduced the habitat's integrity and diversity, negatively impacting the plant communities.</p> <p>No fauna or flora SCC observed, and none expected to be resident within the habitat unit.</p> | Low | <br> |



| Survey Point   | Description   | SEI      | Photographs  |
|--|---|----------|--|
| Site GPS<br>Reference:<br>Marker 6<br>Date:<br>26/09/2024<br>GPS<br>Coordinates:<br>24°18'23.06"S<br>27°24'51.40"E | <b>Degraded Western Sandy Bushveld</b><br>The Degraded Western Sandy Bushveld habitat unit features large tree species along with tall shrubs and grasses. Although it is semi-natural bushveld, it has been disturbed by past mining activities, overgrazing, and road construction. These disturbances have reduced the habitat's integrity and diversity, negatively impacting the plant communities.<br>No fauna or flora SCC observed, and none expected to be resident within the habitat unit. | Low      |    |
|  |   |          |   |
| Site GPS<br>Reference:<br>Marker 8<br>Date:<br>26/09/2024<br>GPS<br>Coordinates:<br>24°18'17.03"S<br>27°24'57.61"E | <b>Modified</b><br>The modified areas have little to no remaining natural vegetation due to land transformation by historic mining activities, roads, and mismanagement. No fauna or flora SCC observed, and none expected for the habitat unit.  | Very Low |  |



| Survey Point | Description | SEI | Photographs  |
|--------------|-------------|-----|--|
|              |             |     |  |



### 3.3 Habitat Assessment

Two (2) main habitat types were identified across the PAOI and include:

- Degraded Western Sandy Bushveld; and
- Modified.

The habitat units for the PAOI can be seen delineated in Figure 3-1 and descriptions of the habitat units can be found in Table 3-4.



**Figure 3-1** Habitats identified within the PAOI



**Table 3-4**      **Table providing descriptions of the habitat types delineated for the PAOI**

| Habitat                         | Description and Condition   |
|---------------------------------|---|
| Degraded Western Sandy Bushveld | <p>The Degraded Western Sandy Bushveld habitat unit is characterized by assemblages of large, tall species, including <i>Vachellia</i> spp., <i>Senegalia</i> spp., <i>Combretum</i> spp., and <i>Terminalia</i> spp., in conjunction with some tall shrubs and various grass species. It is considered semi-natural bushveld but exhibits various disturbances.</p> <p>The habitat has been negatively impacted by several factors, including edge effects from previous mining activities, overgrazing, and the creation of roads. These disturbances have led to reduced habitat integrity and diversity, adversely affecting the floral communities.</p> <p>The ecological services provided by this habitat type include forage for livestock, wood for charcoal production, wood for fire, non-timber products for local communities, water flow regulation, reduction of soil erosion, contribution to local hydrological cycles, carbon sequestration, climatic regulation, and climate change impact mitigation. Additionally, this habitat serves as foraging and nesting resources for livestock and local indigenous fauna species and is an important corridor for fauna dispersion within the landscape.</p> <p>No fauna or flora Species of Conservation Concern (SCC) (including avifauna) were observed, and none are expected to be resident/breed in the PAOI.</p> |
| Modified                        | <p>The modified areas exhibit minimal to no remaining natural vegetation due to extensive land transformation resulting from historic mining activities, road construction, and mismanagement. These habitats exist in a perpetually disturbed state and are unable to recover to a more natural condition due to ongoing disturbances and impacts.</p> <p>The ecological services provided by this habitat are significantly limited, primarily due to the extensive cover of impermeable surfaces and large expanses of bare land. Despite these limitations certain sections of the area may function as movement corridors. No fauna or flora SCC were observed, and none are expected to reside within the Project Area of Influence PAOI.</p>   |



### 3.4 Site Ecological Importance

Based on the criteria provided in Appendix B of this report, all habitats within the PAOI were assigned a sensitivity category, i.e., a SEI category. The PAOI was categorised as possessing habitats with areas ranging from 'Very Low' to 'Low' SEI (Table 3-4 and Figure 3-5). This indicates that the findings of this assessment are contrary to the Screening Tool with respect to the Combined Terrestrial Biodiversity Theme sensitivity.

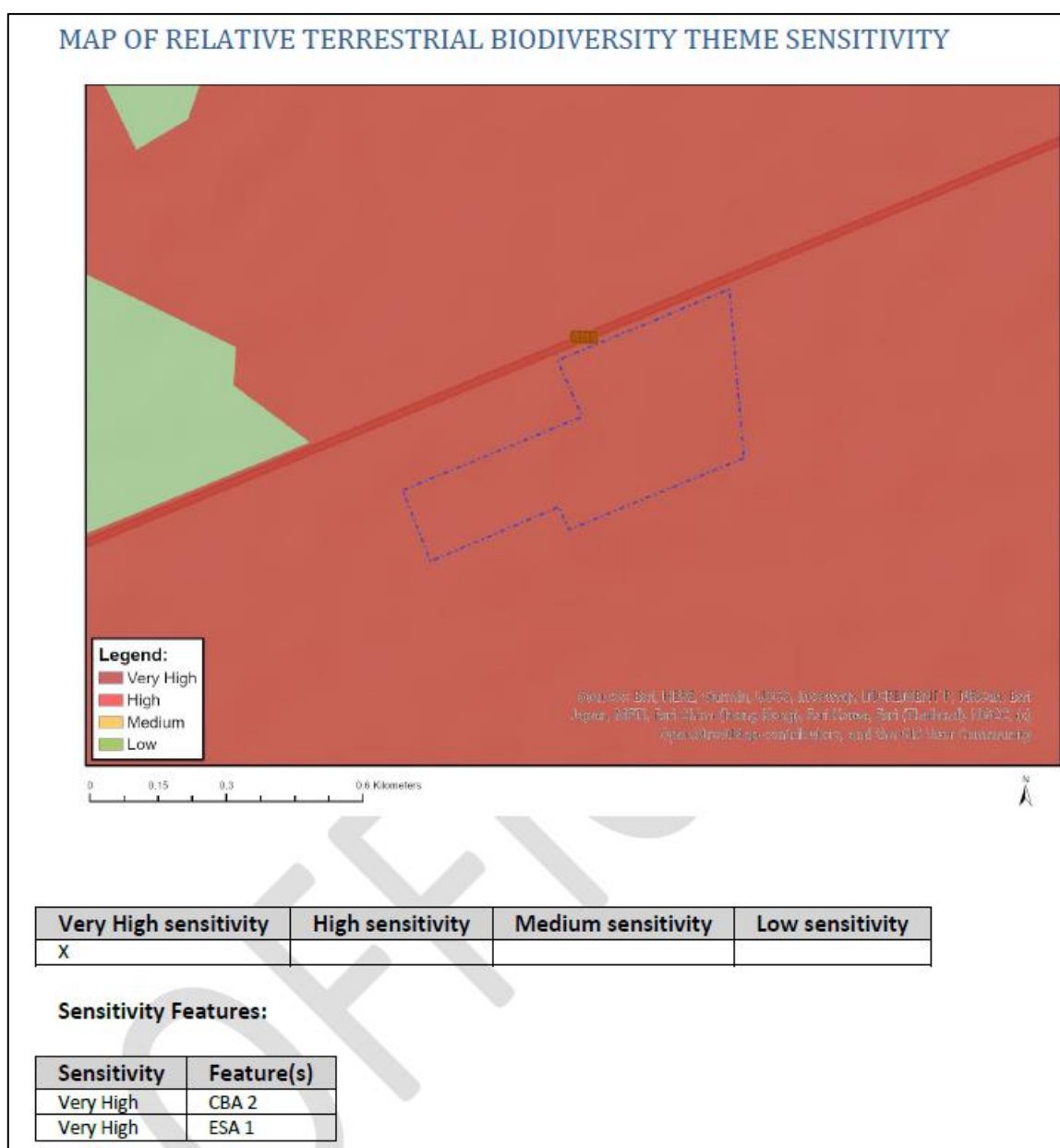
**Table 3-5 Summary of habitat types delineated within the PAOI**

| Habitat Type                           | Conservation Importance   | Functional Integrity                               | Biodiversity Importance | Receptor Resilience  | Site Ecological Importance Guidelines  |
|--|---|--|-------------------------|--|--|
|  | Medium  | Low  |                         | Medium   | Low  |
| <b>Degraded Western Sandy Bushveld</b> | > 50% of receptor contains natural habitat with potential to support SCC. | Small (> 1 ha but < 5 ha) area.                    | <b>Low</b>              | Will recover slowly (~ more than 10 years) to restore > 75% of the original species composition and functionality of the receptor functionality.   | Minimisation and restoration mitigation – development activities of medium to high impact acceptable followed by appropriate restoration activities. |
|  | Very Low  | Very Low   |                         | High   | Very Low   |
| <b>Modified</b>                        | No natural habitat remaining.   | Several major current negative ecological impacts. | <b>Very Low</b>         | Habitat that can recover relatively quickly (~ 5–10 years) to restore > 75% of the original species composition and functionality of the receptor functionality, or species that have a high likelihood of: (i) remaining at a site even when a disturbance or impact is occurring, or (ii) returning to a site once the disturbance or impact has been removed. | Minimisation mitigation – development activities of medium to high impact acceptable and restoration activities may not be required.                 |



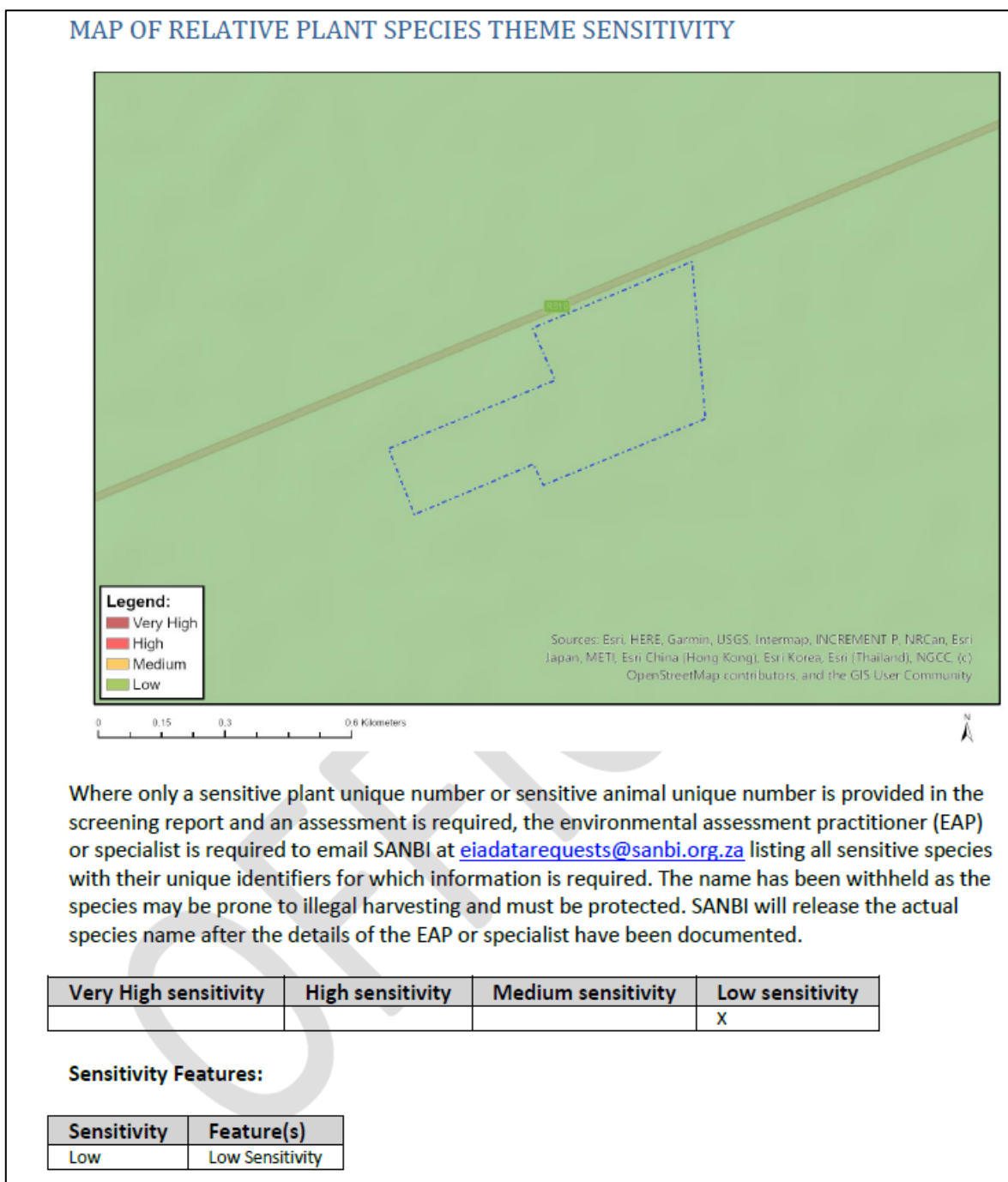
The following is deduced from the National Web-based Environmental Screening Tool Regulation 16(1)(v) of the Environmental Impact Assessment Regulations 2014, as amended):

- Terrestrial Biodiversity Theme sensitivity is Very High for the proposed PAOI, due to its overlapping with Terrestrial CBA 2 and ESA 1 (Figure 3-2);
- Plant Species Theme sensitivity is Low for the proposed PAOI (Figure 3-3); and
- Animal Species Theme sensitivity is High for the proposed development area due to the possible presence of two high sensitivity species and a number of medium sensitivity species (Figure 3-4).



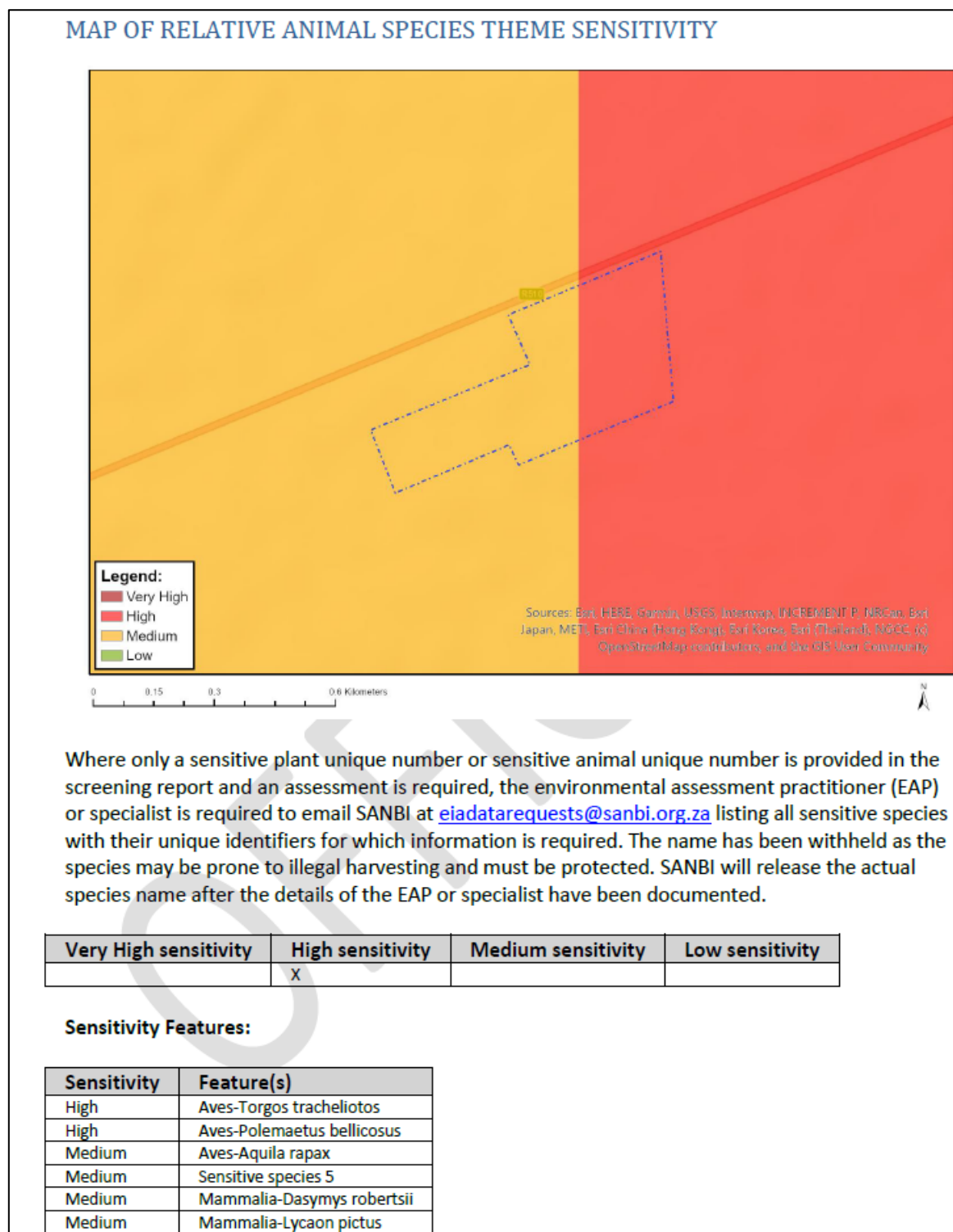
**Figure 3-2 Terrestrial Biodiversity Theme Sensitivity**





**Figure 3-3 Plant Species Theme Sensitivity**





**Figure 3-4 Animal Species Theme Sensitivity**



### 3.4.2 Screening Tool Comparison

The allocated sensitivities for each of the relevant themes are either disputed or validated for the overall PAOI in Table 3-6 below. A summative explanation for each result is provided as relevant. The specialist-assigned sensitivity ratings are based largely on the SEI process followed in the previous section, and consideration is given to any observed or likely presence of SCC species. A map illustrating the overall SEI allocations for the PAOI can be seen in Figure 3-5

**Table 3-6 Summary of the screening tool vs specialist assigned sensitivities**

| Screening Tool Theme | Screening Tool | Specialist | Tool Validated or Disputed by Specialist - Reasoning  |
|----------------------|----------------|------------|---|
| Animal Theme         | High           | Low        | Disputed – Habitat exists in a largely degraded or modified state with high levels of anthropogenic disturbance, particularly those associated with the previously mined quarry. No SCC observed and unlikely to be resident/breed on site, although some may use the habitats on site for foraging and as a movement corridor. |
| Plant Theme          | Medium         | Low        | Disputed – Habitat exists in a largely degraded or modified state with high levels of anthropogenic disturbance, particularly those associated with the previously mined quarry. High numbers of alien and invasive plants. No SCC observed and unlikely to occur.  |
| Terrestrial Theme    | Very High      | Low        | Disputed – Habitat exists in a largely degraded or modified state with high levels of anthropogenic disturbance, particularly those associated with the previously mined quarry, and has therefore lost much of its ecosystem functionality.  |



**Figure 3-5 Map illustrating the site ecological importance for the PAOI**



## 4 Impact Management and Mitigation Plan

The aim of the management outcomes is to present mitigation actions in such a way that they can be incorporated into the Environmental Management Programme (EMPr), and possible biodiversity management programme, for the project, which should in turn allow for a more successful implementation and auditing of the mitigations and monitoring guidelines. Table 4-1 presents the recommended mitigation measures and the respective time frames, targets, and performance indicators relative to the terrestrial assessment.

The focus of mitigation measures is to reduce the significance of the likely impacts associated with the development, and thereby:

- Prevent the further loss and fragmentation of indigenous vegetation communities within the ecosystem in the vicinity of the PAOI;
- Reduce the negative fragmentation effects of the development and enable the safe movement of fauna species;
- Prevent the direct and indirect loss and disturbance of flora and fauna species and communities, including the negative effects associated with the introduction and proliferation of alien and invasive species; and
- Adequately follow the guidelines for interpreting the Site Ecological Importance ratings assigned to the PAOI.



**Table 4-1** *Project specific mitigation measures including requirements for timeframes, roles and responsibilities*

| Management outcome: Vegetation and Habitats  |                                  |   |                                |              |
|--|----------------------------------|---|--------------------------------|--------------|
| Impact Management Actions  | Implementation                   |   | Monitoring                     |              |
|  | Phase                            | Responsible Party                                   | Aspect                         | Frequency    |
| Laydown and construction preparation activities (such as cement mixing, temporary toilets, etc.) must be limited to already modified areas and should take up the smallest footprint possible.   | Construction Phase               | Project manager, Environmental Officer              | Development footprint          | Ongoing      |
| Develop post-mining environments, in conjunction with regional development plans; and the recreation of habitats, where possible; or structure altered landscapes to be compatible with regional habitats.   | Life of operation                | Project manager, Environmental Officer              | Development footprint          | Ongoing      |
| It is recommended that areas to be developed/disturbed be specifically demarcated so that during the construction/activity phase, only the demarcated areas be impacted upon.  | Construction Phase               | Project manager, Environmental Officer              | Development footprint          | Ongoing      |
| Areas of indigenous vegetation, even secondary communities outside of the direct project footprint, should not be fragmented or disturbed further if possible.   | Construction Phase               | Project manager, Environmental Officer              | Development footprint          | Ongoing      |
| All vehicles and personnel must make use of existing roads and walking paths as far as possible, especially construction/operational vehicles.   | Construction Phase               | Project manager, Environmental Officer              | Development footprint          | Ongoing      |
| The clearing of vegetation must be minimised where possible. All activities must be restricted to within the authorised areas.   | Life of operation                | Project manager, Environmental Officer              | Areas of indigenous vegetation | Ongoing      |
| All individuals of any protected plant species that are present need a relocation or destruction permit in order to be removed or destroyed due to the development. High-visibility flags must be placed near any threatened/protected plants in order to avoid any damage or destruction of the species. If left undisturbed, the sensitivity and importance of these species needs to be part of the environmental awareness program. If infrastructure, development areas and routes occur where protected plants cannot be avoided, the protected plants should be removed from the soil and relocated/ re-planted in similar habitats where they should be able to resprout and flourish again. All protected and red-data plants should be relocated, and as many other geophytic species as possible. | Life of operation                | Project manager, Environmental Officer              | Protected Tree/Plant species   | Ongoing      |
| A site walkthrough must be conducted by a suitably qualified specialist prior to the construction phase. The site walkthrough must be conducted during the summer season between November and March. Priority must be the identification of any listed flora species, particularly protected species.  | Planning Phase, Pre-Construction | Project manager, Environmental Officer & Contractor | Plant & animal species         | Once off     |
| Any observed protected plants must be clearly demarcated prior to the commencement of site clearing. If construction activities are likely to affect any protected plants these individuals must be relocated as part of a plant rescue and protection plan, and a permit must be obtained before doing so, or destruction permits must be obtained.   | Planning Phase                   | Environmental Officer                               | Protected plants and SCC       | During phase |



## Ruigtevley Quarry

|  |                                    |  |   |   |
|--|------------------------------------|--|---|---|
| Materials may not be stored for extended periods of time and must be removed from the PAOI once the construction phase has been concluded. No permanent construction phase structures should be permitted. Construction buildings should preferably be prefabricated or constructed of re-usable/recyclable materials. No storage of vehicles or equipment will be allowed outside of the designated laydown areas.  | Construction and Operational Phase | Environmental Officer, Design Engineer, and Contractor | Laydown areas   | Ongoing   |
| Areas that are denuded during construction need to be re-vegetated with indigenous vegetation according to a habitat rehabilitation plan, to prevent erosion during flood and wind events and to promote the regeneration of functional habitat. This will also reduce the likelihood of encroachment by alien invasive plant species. All grazing mammals must be kept out of the areas that have recently been re-planted.   | Operational phase                  | Environmental Officer & Contractor                     | Assess the state of rehabilitation and encroachment of alien vegetation | Quarterly for up to two years after the closure |
| A habitat rehabilitation plan must be implemented, and areas of bare ground must be revegetated with species indigenous to the region. This must also apply to areas below the panels.   | Life of Operation                  | Project manager, Environmental Officer                 | Rehabilitation  | Ongoing   |
| <p>A hydrocarbon spill management plan must be put in place to ensure that should there be any chemical spill out or over that it does not run into the surrounding areas. The Contractor shall be in possession of an emergency spill kit that must always be complete and available on site.</p> <ul style="list-style-type: none"> <li>• Drip trays or any form of oil absorbent material must be placed underneath vehicles/machinery and equipment when not in use.</li> <li>• No servicing of equipment on site unless necessary.</li> <li>• All contaminated soil / yard stone shall be treated in situ or removed and be placed in containers.</li> <li>• Appropriately contain any generator diesel storage tanks, machinery spills (e.g., accidental spills of hydrocarbons oils, diesel etc.) in such a way as to prevent them from leaking and entering the environment.</li> <li>• Construction activities and vehicles could cause spillages of lubricants, fuels and waste material negatively affecting the functioning of the ecosystem.</li> <li>• All vehicles and equipment must be maintained, and all re-fueling and servicing of equipment is to take place in demarcated areas outside of the PAOI.</li> </ul> | Life of operation                  | Environmental Officer & Contractor                     | Spill events, Vehicles dripping.  | Ongoing   |
| It must be made an offence for any staff member to remove any indigenous plant species from the PAOI or bring any alien species in. This is to prevent the spread of exotic or alien species or the illegal collection of plants.  | Life of operation                  | Project manager, Environmental Officer                 | Any instances   | Ongoing   |
| All construction waste must be removed from site at the closure of the construction phase.   | Construction phase                 | Environmental Officer & Contractor                     | Construction waste  | During Phase                                    |
| <b>Management outcome: Fauna</b>   |                                    |  |   |   |
| <b>Impact Management Actions</b>   | <b>Implementation</b>              |  | <b>Monitoring</b>   |   |



|   | Phase                          | Responsible Party  | Aspect   | Frequency    |
|---|--------------------------------|--|--|--------------|
| A qualified environmental control officer must be on site when activities begin. A site walk through must be performed by a suitably qualified ecologist prior to any activities taking place and any SSC or protected species should be noted. In situations where these species are observed and must be removed, the proponent may only do so after the required permission/permits have been obtained in accordance with national and provincial legislation. In the abovementioned situation the development and implementation of a search, rescue and recovery program is suggested for the protection of these species. Should animals not move out of the area on their own, relevant specialists must be contacted to advise on how the species can be relocated. | Construction Phase             | Environmental Officer, Contractor                        | Presence of any floral or faunal SCC                           | During phase |
| Clearing and disturbance activities must be conducted in a progressive linear manner, always outwards and away from the centre of the PAOI and over several days, so as to provide an easy escape route for all small mammals and herpetofauna.   | Construction Phase             | Environmental Officer & Contractor                       | Progressive land clearing operations and the movement of fauna | Ongoing      |
| The areas to be disturbed must be specifically and responsibly demarcated to prevent the movement of staff or any individual into the surrounding environments, signs must be put up to enforce this.   | Construction/Operational Phase | Project manager, Environmental Officer                   | Infringement into these areas                                  | Ongoing      |
| The duration of the activities should be minimised to as short a term as possible, to reduce the period of disturbance on fauna.  | Construction                   | Project manager, Environmental Officer & Design Engineer | Construction/Closure Phase                                     | Ongoing      |
| Noise must be kept to an absolute minimum during the evenings and at night to minimise all possible disturbances to reptile species and nocturnal mammals.  | Construction/Operational Phase | Environmental Officer                                    | Noise levels <sup>2</sup>                                      | Ongoing      |
| No trapping, killing, or poisoning of any wildlife is to be allowed and signs must be put up to enforce this. Monitoring must take place in this regard.  | Life of operation              | Environmental Officer                                    | Evidence of trapping etc                                       | Ongoing      |
| Outside lighting should be designed and limited to minimise impacts on fauna. All outside lighting should be directed away from any sensitive areas. Fluorescent and mercury vapor lighting should be avoided, and sodium vapor (green/red) lights should be used wherever possible.  | Construction/Operational Phase | Project manager, Environmental Officer & Design Engineer | Light pollution and period of light                            | Ongoing      |
| All construction and maintenance motor vehicle operators should undergo an environmental induction that includes instruction on the need to comply with speed limits, to respect all forms of wildlife. Speed limits must be enforced to ensure that road killings and erosion is limited.  | Life of operation              | Health and Safety Officer                                | Compliance to the training                                     | Ongoing      |
| Schedule activities and operations during least sensitive periods, to avoid migration, nesting, and breeding seasons. In this case, activities should take place during the day.  | Life of operation              | Project manager, Environmental Officer & Design Engineer | Activities should take place during the day                    | Ongoing      |

<sup>2</sup> At 250 m, the recorded noise levels range between 30dB and 35dB. This is comparable to ambient noise levels such as distant traffic or light wind and is considered non-disruptive to wildlife.



## Ruigtevley Quarry

|   |                                |  |   |         |
|---|--------------------------------|--|---|---------|
| Any holes/deep excavations must be dug in a progressive manner and shouldn't be left open overnight. Should any holes remain open overnight they must be properly covered temporarily to ensure that no small fauna species fall in. Holes must be subsequently inspected for fauna prior to backfilling. | Planning and Construction      | Environmental Officer & Contractor, Engineer | Presence of trapped animals and open holes              | Ongoing |
| If fencing is required: wildlife-permeable fencing with holes large enough for mongoose and other smaller mammals should be installed, the holes must not be placed in the fence where it is next to a major road as this will increase road killings in the area.  | Planning and construction      | Environmental Officer & Contractor, Engineer | Fauna movement corridor                                 | Ongoing |
| Schedule blasting activities to avoid critical periods for wildlife, such as breeding and nesting seasons.  | Construction/Operational Phase | Environmental Officer & Contractor, Engineer | Activities should not take place during breeding season | Ongoing |
| Limit blasting to specific times of the day to reduce disturbance to nocturnal and diurnal species.   | Construction/Operational Phase | Environmental Officer & Contractor, Engineer | Activities should take place during the day             | Ongoing |
| Implement noise and vibration monitoring programs to ensure levels remain within acceptable limits as per South African environmental standards.  | Construction/Operational Phase | Environmental Officer & Contractor, Engineer | Noise and vibration levels                              | Ongoing |
| Use controlled blasting techniques, such as delayed blasting and smaller charge sizes, to minimize noise and vibration impacts.   | Construction/Operational Phase | Environmental Officer & Contractor, Engineer | Noise and vibration levels                              | Ongoing |

**Management outcome: Alien Species**

| Impact Management Actions   | Implementation                 |   | Monitoring  |                   |
|---|--------------------------------|---|---|-------------------|
|   | Phase                          | Responsible Party                                   | Phase   | Responsible Party |
| An Alien Invasive Plant (AIP) Management Plan must be compiled and implemented. This should regularly be updated to reflect the annual changed in AIP composition.  | Life of operation              | Project manager, Environmental Officer & Contractor | Manage and assess presence and encroachment of alien vegetation | Twice a year      |
| The footprint area of the construction should be kept to a minimum. The footprint area must be clearly demarcated to avoid unnecessary disturbances to adjacent areas. Footprints of the roads must be kept to prescribed widths. | Construction/Operational Phase | Project manager, Environmental Officer & Contractor | Footprint Area  | Life of operation |
| A pest control plan must be put in place and implemented; it is imperative that poisons not be used to control pests.   | Life of operation              | Environmental Officer & Health and Safety Officer   | Evidence or presence of pests                                   | Life of operation |

**Management outcome: Dust**

| Impact Management Actions   | Implementation     |                   | Monitoring |                          |
|---|--------------------|-------------------|------------|--------------------------|
|   | Phase              | Responsible Party | Phase      | Responsible Party        |
| Dust-reducing mitigation measures must be put in place and must be strictly adhered to. This includes the wetting of exposed soft soil surfaces. No non-environmentally friendly suppressants may be used as this could result in the pollution of water sources. | Construction phase | Contractor        | Dustfall   | Dust monitoring program. |

**Management outcome: Waste Management**

| Impact Management Actions | Implementation |                   | Monitoring |                   |
|---------------------------|----------------|-------------------|------------|-------------------|
|                           | Phase          | Responsible Party | Phase      | Responsible Party |



## Ruigtevley Quarry

|  |                            |   |  |                        |
|--|----------------------------|---|--|------------------------|
| Waste management must be a priority and all waste must be collected and stored effectively and responsibly according to a site-specific waste management plan. Dangerous waste such as metal wires and glass must only be stored in fully sealed and secure containers, before being moved off site as soon as possible. | Life of operation          | Environmental Officer & Contractor                            | Waste Removal  | Weekly                 |
| Litter, spills, fuels, chemical and human waste in and around the PAOI must be minimised and controlled according to the waste management plan.  | Construction/Closure Phase | Environmental Officer & Health and Safety Officer             | Presence of Waste                                    | Daily                  |
| Cement mixing may not be performed on the ground. It is recommended that only closed side drum or pan type concrete mixers be utilised. Any spills must be immediately contained and isolated from the natural environment, before being removed from site.  | Construction Phase         | Environmental Officer & Contractor                            | Cement mixing and spills                             | Every occurrence       |
| Toilets at the recommended Health and Safety standards must be provided. These should be emptied regularly and once no longer required, they must be pumped dry to prevent leakage into the surrounding environment and removed from site.   | Life of operation          | Environmental Officer & Health and Safety Officer             | Number of toilets per staff member. Waste levels     | Daily                  |
| The Contractor should supply sealable and properly marked domestic waste collection bins and all solid waste collected shall be disposed of at a licensed disposal facility within every 10 days at least.   | Life of operation          | Environmental Officer & Health and Safety Officer             | Availability of bins and the collection of the waste | Ongoing                |
| Where a registered disposal facility is not available close to the PAOI, the Contractor shall provide a method statement with regards to waste management. Under no circumstances may domestic waste be burned on site or buried on open pits.   | Life of operation          | Environmental Officer, Contractor & Health and Safety Officer | Collection/handling of the waste                     | Ongoing                |
| Refuse bins will be responsibly emptied and secured. Temporary storage of domestic waste shall be in covered and secured waste skips. Maximum domestic waste storage period will be 10 days.   | Life of operation          | Environmental Officer, Contractor & Health and Safety Officer | Management of bins and collection of waste           | Ongoing, every 10 days |

**Management outcome: Environmental Awareness Training**

| Impact Management Actions  | Implementation         |  | Monitoring                 |                   |
|--|------------------------|--|----------------------------|-------------------|
|  | Phase                  | Responsible Party                                | Phase                      | Responsible Party |
| All personnel and contractors are to undergo Environmental Awareness Training. A signed register of attendance must be kept for proof. Discussions are required on sensitive environmental receptors within the PAOI to inform contractors and site staff of the presence of protected species, their identification, conservation status and importance, biology, habitat requirements and management requirements in line with the Environmental Authorisation and within the EMP. | Pre-construction phase | Health and Safety Officer, Environmental Officer | Compliance to the training | Ongoing           |

**Management outcome: Erosion**

| Impact Management Actions  | Implementation    |  | Monitoring                      |                   |
|--|-------------------|--|---------------------------------|-------------------|
|  | Phase             | Responsible Party                      | Phase                           | Responsible Party |
| Speed limits must be put in place to reduce erosion. Soil surfaces must be wetted as necessary to reduce the dust generated by the project activities. Speed bumps and signs must be erected to enforce slow speeds. | Life of operation | Project manager, Environmental Officer | Water Runoff from road surfaces | Ongoing           |



## Ruigtevley Quarry

|   |                   |   |   |                                       |
|---|-------------------|---|---|---------------------------------------|
| Only existing access routes and walking paths may be made use of. New roads must be authorised.   | Life of operation | Project manager,<br>Environmental Officer | Routes used within the area               | Ongoing                               |
| Areas that are denuded during construction need to be re-vegetated with indigenous vegetation to prevent erosion during flood events etc. | Life of operation | Project manager,<br>Environmental Officer | Re-establishment of indigenous vegetation | Progressively                         |
| A stormwater management plan must be compiled and implemented if necessary.   | Life of operation | Project manager,<br>Environmental Officer | Management plan                           | Before construction phase:<br>Ongoing |



## 5 Conclusion

Portions of the PAOI have been altered both presently and historically. The historical mining activities as well as livestock land use have had an impact on both the fauna and the flora of the area, which is evident in the degraded and modified habitats.

During the assessment one (*Sclerocarya birrea caffra*, Marula tree) protected tree species were recorded and is protected by the List of Protected Tree Species under the National Forests Act, 1998 (Act No. 84 of 1998) (NFA). Should they need to be removed, the appropriate permits must be procured prior to the relocation or removal of these species.

Due to the seasonal restraints at the time of this assessment, a site walkdown is recommended prior to any construction activities taking place to identify if any additional protected plant species are present on site. These must be marked and relocated to a similar habitat nearby which will not be affected by construction activities. Alternatively, as mentioned above applications for destruction permits must then be made.

Completion of the terrestrial biodiversity assessment led to the dispute of the 'Very High' classification for the terrestrial biodiversity theme sensitivity as allocated by the National Environmental Screening Tool. The PAOI is instead assigned an overall terrestrial sensitivity of 'Low'.

### 5.1 Impact Statement

The location, state and size of the ecosystem suggests that it is unlikely that any functional habitat or SCCs will be lost as a result of the impacts arising from the proposed activities. However, these assumptions pertain to the terrestrial habitat within the PAOI only.

### 5.2 Specialist Opinion

It is the opinion of the specialist that the proposed development is favourable only if all mitigation measures provided in this and other specialist reports are implemented, as well as the following:

- A site walkdown during the correct flowering season (between November and March) must be conducted for all protected plant species present on site, along with the acquisition of permits for the relocation/destruction of species;
- An alien invasion plant (AIP) management plan must be compiled and implemented; and
- A rehabilitation plan must be compiled and implemented for all areas of the PAOI impacted by the project activities.



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## 7 Appendix Items

### 7.1 Appendix A: Methods

#### 7.1.1 Desktop Dataset Assessment

##### 7.1.1.1 Ecologically Important Landscape Features

Existing ecologically relevant data layers were incorporated into a GIS to establish how the proposed development might interact with any ecologically important entities. Emphasis was placed around the following spatial datasets:

- National Biodiversity Assessment 2018 (Skowno *et al*, 2019) - The purpose of the National Biodiversity Assessment (NBA) is to assess the state of South Africa's biodiversity based on best available science, with a view to understanding trends over time and informing policy and decision-making across a range of sectors. The NBA deals with all three components of biodiversity: genes, species and ecosystems; and assesses biodiversity and ecosystems across terrestrial, freshwater, estuarine and marine environments. The two headline indicators assessed in the NBA are:
  - Ecosystem Protection Level – indicator of the extent to which ecosystems are adequately protected or under-protected. Ecosystem types are categorised as Well Protected (WP), Moderately Protected (MP), Poorly Protected (PP), or Not Protected (NP), based on the proportion of the biodiversity target for each ecosystem type that is included within one or more protected areas. Not Protected, Poorly Protected or Moderately Protected ecosystem types are collectively referred to as under-protected ecosystems.
- Red List of Ecosystems (RLE) 2021 – The list was first published in 2011 and has since been substantially revised by authors Dr Andrew Skowno and Mrs Maphale Monyeki (SANBI, 2022). This list is based on assessments that followed the International Union for Conservation of Nature (IUCN) Red List of Ecosystems Framework (version 1.1) and covers all 456 terrestrial ecosystem types described in South Africa by Mucina and Rutherford (2006). A total of 120 of the 456 terrestrial ecosystem types assessed are categorised as threatened and together make up approximately 10% of the remaining natural habitat in the country. Of these 120 ecosystem types, 55 are Critically Endangered (CR), 51 Endangered (EN) and 14 are Vulnerable (VU). The remainder are categorised as Least Concern (LC) (SANBI, 2022; Skowno & Monyeki, 2021).
- Protected areas:
  - South Africa Protected Areas Database (SAPAD) and South Africa Conservation Areas Database (SACAD) (DFFE, 2023a) – The South African Protected Areas Database (SAPAD) and South Africa Conservation Areas Database (SACAD) contains spatial data for the conservation of South Africa. It includes spatial and attribute information for both formally protected areas and areas that have less formal protection. The database is updated on a continuous basis and forms the basis for the Register of Protected Areas which is a legislative requirement under the National Environmental Management: Protected Areas Act, Act 57 of 2003.
  - National Protected Areas Expansion Strategy (NPAES) (DFFE, 2022b) – The National Protected Area Expansion Strategy (NPAES) provides spatial information on areas that are suitable for terrestrial ecosystem protection. These focus areas are large, intact



and unfragmented and are therefore, of high importance for biodiversity, climate resilience and freshwater protection.

- Conservation/Biodiversity Sector Plans:
  - The Limpopo Conservation Plan was completed in 2018 for the Limpopo Department of Economic Development, Environment & Tourism (LEDET) (Desmet et al., 2018). The purpose of the LCPv2 was to develop the spatial component of a bioregional plan (i.e. map of Critical Biodiversity Areas and associated land-use guidelines). The previous Limpopo Conservation Plan (LCPv1) was completely revised and updated (Desmet et al., 2013). A Limpopo Conservation Plan map was produced as part of this plan and sites were assigned to the following CBA categories based on their biodiversity characteristics, spatial configuration and requirement for meeting targets for both biodiversity pattern and ecological processes:
    - Critical Biodiversity Area 1 (CBA1);
    - Critical Biodiversity Area 2 (CBA2);
    - Ecological Support Area 1 (ESA1);
    - Ecological Support Area 2 (ESA2);
    - Other Natural Area (ONA);
    - Protected Area (PA); and
    - No Natural Remaining (NNR).
  - Critical Biodiversity Areas (CBAs) are terrestrial and aquatic areas of the landscape that need to be maintained in a natural or near-natural state to ensure the continued existence and functioning of species and ecosystems and the delivery of ecosystem services. Thus, if these areas are not maintained in a natural or near natural state then biodiversity targets cannot be met. Maintaining an area in a natural state can include a variety of biodiversity compatible land uses and resource uses (Desmet et al., 2013).
  - Ecological Support Areas (ESA's) are not essential for meeting biodiversity targets but play an important role in supporting the ecological functioning of Critical Biodiversity Areas and/or in delivering ecosystem services (SANBI, 2017). Critical Biodiversity Areas and Ecological Support Areas may be terrestrial or aquatic.
  - Other Natural Areas (ONAs) consist of all those areas in good or fair ecological condition that fall outside the protected area network and have not been identified as CBAs or ESAs. A biodiversity sector plan or bioregional plan must not specify the desired state/management objectives for ONAs or provide land-use guidelines for ONAs (Driver et al., 2017).
  - Areas with No Natural Habitat Remaining (NNR) are areas in poor ecological condition that have not been identified as CBAs or ESAs. They include all irreversibly modified areas (such as urban or industrial areas and mines), and most severely modified areas (such as cultivated fields and forestry plantations). A biodiversity sector plan or bioregional plan must not specify the desired state/management objective or provide land-use guidelines for NNR areas (Driver et al., 2017); and



- A new set of Key Biodiversity Areas (KBA) specific to South Africa has been identified using the Global Standard for the Identification of Key Biodiversity Areas version 1.2 (IUCN 2016), applied to South African species and ecosystems. KBAs are critical sites that play a vital role in maintaining global biodiversity by serving as essential habitats for species. The identification of KBAs enables governments and civil society to pinpoint key locations crucial for species and their habitats worldwide. This understanding facilitates collaborative efforts to manage and conserve these areas, thereby safeguarding global biological diversity and supporting international biodiversity objectives.

Unlike the Important Bird Areas (IBAs), which primarily focus on birds, the KBA framework encompasses a broader spectrum of biodiversity, including mammals, amphibians, plants, and other taxa. BirdLife South Africa (BLSA), in consultation with the KBA National Coordination Group, has opted to retire IBAs and integrate KBAs into its conservation strategy. This strategic shift acknowledges the necessity of investing resources effectively to protect avian and other macroecological elements at the site level within a comprehensive framework of biodiversity conservation (KBA NCG, 2024).

- Freshwater Ecology:
  - Strategic Water Source Areas (SWSAs) (Le Maitre *et al*, 2018) – SWSAs are defined as areas of land that supply a quantity of mean annual surface water runoff in relation to their size and therefore, contribute considerably to the overall water supply of the country. These are key ecological infrastructure assets and the effective protection of surface water SWSAs areas is vital for national security because a lack of water security will compromise national security and human wellbeing.
  - South African Inventory of Inland Aquatic Ecosystems (SAIIAE) (Van Deventer *et al*, 2018) – A South African Inventory of Inland Aquatic Ecosystems (SAIIAE) was established during the National Biodiversity Assessment of 2018. It is a collection of data layers that represent the extent of river and inland wetland ecosystem types as well as pressures on these systems.
  - National Freshwater Ecosystem Priority Area (NFEPA) (Nel *et al.*, 2011) – The NFEPA database provides strategic spatial priorities for conserving the country's freshwater ecosystems and associated biodiversity as well as supporting sustainable use of water resources.



## 7.2 Appendix B: Terrestrial Site Ecological Importance

The different habitat types within the PAOI were delineated and identified based on observations made during the field survey, and information from available satellite imagery. These habitat types were assigned Ecological Importance (EI) categories based on their ecological integrity, conservation value, the presence of SCC and their ecosystem processes.

Site Ecological Importance (SEI) is a function of the Biodiversity Importance (BI) of the receptor (e.g., SCC, the vegetation/fauna community or habitat type present in the Project Area) and Receptor Resilience (RR) (its resilience to impacts).

BI is a function of Conservation Importance (CI) and the Functional Integrity (FI) of the receptor. The criteria for the CI and FI ratings are provided in Table 7-1 and Table 7-2 respectively.

**Table 7-1 Summary of Conservation Importance (CI) criteria**

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



**Table 7-2 Summary of Functional Integrity (FI) criteria**

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

BI can be derived from a simple matrix of CI and FI as provided in Table 7-3.

**Table 7-3 Matrix used to derive Biodiversity Importance (BI) from Functional Integrity (FI) and Conservation Importance (CI)**

| Biodiversity Importance |           | Conservation Importance |           |          |          |          |
|-------------------------|-----------|-------------------------|-----------|----------|----------|----------|
|                         |           | Very High               | High      | Medium   | Low      | Very Low |
| Functional Integrity    | Very High | Very High               | Very High | High     | Medium   | Low      |
|                         | High      | Very High               | High      | Medium   | Medium   | Low      |
|                         | Medium    | High                    | Medium    | Medium   | Low      | Very Low |
|                         | Low       | Medium                  | Medium    | Low      | Low      | Very Low |
|                         | Very Low  | Medium                  | Low       | Very Low | Very Low | Very Low |



The fulfilling criteria to evaluate RR are based on the estimated recovery time required to restore an appreciable portion of functionality to the receptor, as summarised in Table 7-4.

**Table 7-4 Summary of Receptor Resilience (RR) criteria**

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

After the determination of BI and RR, the SEI can be ascertained using the matrix as provided in Table 7-5.

**Table 7-5 Matrix used to derive Site Ecological Importance from Receptor Resilience (RR) and Biodiversity Importance (BI)**

| Site Ecological Importance |           | Biodiversity Importance |           |          |          |          |
|----------------------------|-----------|-------------------------|-----------|----------|----------|----------|
|                            |           | Very High               | High      | Medium   | Low      | Very Low |
| Receptor Resilience        | Very Low  | Very High               | Very High | High     | Medium   | Low      |
|                            | Low       | Very High               | Very High | High     | Medium   | Very Low |
|                            | Medium    | Very High               | High      | Medium   | Low      | Very Low |
|                            | High      | High                    | Medium    | Low      | Very Low | Very Low |
|                            | Very High | Medium                  | Low       | Very Low | Very Low | Very Low |



Interpretation of the SEI in the context of the proposed project is provided in Table 7-6.

**Table 7-6** *Guideline for interpreting Site Ecological Importance in the context of proposed activities*

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

The SEI evaluated for each taxon can be combined into a single multi-taxon evaluation of SEI for the assessment area. Either a combination of the maximum SEI for each receptor should be applied, or the SEI may be evaluated only once per receptor but for all necessary taxa simultaneously. For the latter, justification of the SEI for each receptor is based on the criteria that conforms to the highest CI and FI, and the lowest RR across all taxa.



### 7.3 Appendix C: Specialist Declaration of Independence

I, Carami Burger, 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 Act, regulations and any guidelines that have relevance to the proposed activity;
- I will comply with the Act, regulations and all other applicable legislation;
- I have no, and will not engage in, conflicting interests in the undertaking of the activity;
- I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing any decision to be taken with respect to the application by the competent authority; and the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
- All the particulars furnished by me in this form are true and correct; and
- I realise that a false declaration is an offence in terms of Regulation 71 and is punishable in terms of Section 24F of the Act.



Carami Burger

Terrestrial Ecologist

The Biodiversity Company

September 2024



I, Lindi Steyn, 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 Act, regulations and any guidelines that have relevance to the proposed activity;
- I will comply with the Act, regulations and all other applicable legislation;
- I have no, and will not engage in, conflicting interests in the undertaking of the activity;
- I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing any decision to be taken with respect to the application by the competent authority; and the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
- All the particulars furnished by me in this form are true and correct; and
- I realise that a false declaration is an offence in terms of Regulation 71 and is punishable in terms of Section 24F of the Act.



Dr Lindi Steyn

Ecologist

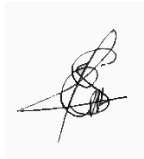
The Biodiversity Company

September 2024



I, Martinus Erasmus, 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 Act, regulations and any guidelines that have relevance to the proposed activity;
- I will comply with the Act, regulations and all other applicable legislation;
- I have no, and will not engage in, conflicting interests in the undertaking of the activity;
- I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing any decision to be taken with respect to the application by the competent authority; and the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
- All the particulars furnished by me in this form are true and correct; and
- I realise that a false declaration is an offence in terms of Regulation 71 and is punishable in terms of Section 24F of the Act.



Martinus Erasmus

Terrestrial Ecologist

The Biodiversity Company

September 2024



## 7.4 Appendix D: Specialist CVs

## Carami Burger

B.Sc. Honours – Ecological Interactions and  
Ecosystem Resilience (Cum Laude)

(Pr Sci Nat)

Cell: +27 83 630 9077

Email: Carami@thebiodiversitycompany.com

Identity Number: 9606250185084

Date of birth: 25 June 1996



### Profile Summary

Working experience in South Africa and Mozambique.

Specialist experience with infrastructure development, road development, renewable energy, mining and prospecting.

Specialist expertise include terrestrial ecology, wetland resources, rehabilitation and management plans, environmental compliance and monitoring.

### Areas of Interest

Renewable Energy & Bulk Services Infrastructure Development, Mining, Farming, Sustainability and Conservation.

### Key Experience

- Environmental Impact Assessments (EIA)
- Basic Assessments
- Terrestrial Ecological Assessments
- Wetland Delineation and Ecological Assessments
- Environmental Management Programmes (EMPr)
- Rehabilitation Plans
- Invasive Species Plans
- Search and Rescue Plans
- Environmental Compliance Audits
- Water Use License Applications
- Dust Fallout Monitoring
- Water Quality Monitoring

### Countries worked in

South Africa  
Mozambique  
Zambia  
Angola  
Sierra Leone

### Nationality

South African

### Languages

English – Proficient

Afrikaans – Proficient

### Qualifications

- BSc Hons Ecological Interactions and Ecosystem Resilience.
- BSc Botany and Zoology.
- Pr Sci Nat (121757)



## Lindi Steyn

PhD Biodiversity and Conservation  
(Pr Sci Nat)

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Identity Number: 8805250050080

Date of birth: 25 May 1988



### Profile Summary

Working experience throughout South Africa and neighbouring countries.

Specialist experience with mining, road development, engineering, renewable energy, protected areas, and biodiversity offsets.

Specialist guidance, support and facilitation for the compliance with legislative processes, for in-country requirements.

Specialist expertise include Avifauna and Terrestrial Ecology.

### Areas of Interest

Mining, Oil & Gas, Renewable Energy & Bulk Services Infrastructure Development, Sustainability and Conservation.

Research publication with a conservation influence.

Ornithology

### OVERVIEW

An overview of the specialist technical expertise includes the following:

- Terrestrial Ecological Assessments.
- Faunal surveys which include mammals, birds, amphibians and reptiles.
- Conservation Plans and Monitoring for terrestrial component.
- Avifaunal surveys.
- Biodiversity offset plans.
- Management plan compilation (Erosion, Plant Rescue, Rehabilitation, Alien Invasive Species Plans).
- Bioaccumulation assessments for birds.
- Toxicity analysis of air dust samples, sediment, water and biota.

### Key Experience

- Environmental Impact Assessment
- Terrestrial Ecological Assessments
- Rehabilitation Plans and Monitoring
- Avifaunal Conservation Surveys
- Conservation Management Plans
- Laboratory analysis
- The use of avifaunal species as indicators of pollution.

### Countries worked in

South Africa  
Swaziland  
Zimbabwe  
Lesotho

### Nationality

South African

### Languages

English – Proficient  
Afrikaans – Proficient

### Qualifications

- PhD Biodiversity and Conservation, University of Johannesburg, South Africa.
- MSc Biodiversity and Conservation, University of Johannesburg, South Africa.
- BSc Hons Biodiversity and Conservation.
- BSc Botany and Zoology.
- Certificate in Field Guiding, Damelin.
- Certificate in Ecotraining.
- Field Guiding FGASA level 1 certificate (2007).



# Martinus Erasmus

## B-Tech Nature Conservation (*Pr Sci Nat*)

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Identity Number: 9209035136082

Date of birth: 03 September 1992



### Profile Summary

Working experience throughout Southern Africa as well as West Africa.

Specialist experience in exploration, mining, engineering, hydropower, private sector, and renewable energy.

Specialist guidance, support, and facilitation for compliance with legislative processes, in-country requirements, and international lenders.

Specialist expertise includes Botany and Terrestrial Ecology.

### Areas of Interest

Mining, Oil & Gas, Renewable Energy & Bulk Services  
Infrastructure Development, Sustainability, and Conservation

### Key Experience

- Familiar with World Bank and the International Finance Corporation requirements
- Environmental, Social, and Health Impact Assessments (ESHIA)
- Environmental Management Programmes (EMP)
- Rehabilitation Plans and Monitoring
- Botany, especially in the Limpopo, Mpumalanga, Gauteng, and North-West provinces in South Africa.
- Veld management and Veld condition

### Country Experience

Eswatini  
Guinea  
Lesotho  
Liberia  
Mauritius  
Mozambique  
Nigeria  
South Africa  
Swaziland  
Zambia

### Nationality

South African

### Languages

English – Proficient

Afrikaans – Proficient I

### Qualifications

- B-Tech in Nature Conservation, Tshwane University of Technology, Pretoria, South Africa.
- National Diploma in Nature Conservation, Tshwane University of Technology, Pretoria, South Africa.
- Pr Sci Nat (118630)