



**THE PROPOSED EXPANSION OF RUSTENBURG  
CHROME MINE'S (RCM) EXISTING OPENCAST PIT  
AT THEIR EXISTING MINING OPERATIONS NEAR  
KROONDAL IN THE RUSTENBURG LOCAL  
MUNICIPALITY IN THE NORTH WEST PROVINCE.**

**Rustenburg Local Municipality, Bojanala Platinum  
District Municipality, North West Province, South  
Africa**

03/12/2025

**Prepared by:**






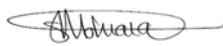

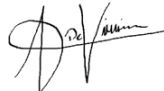
**The Biodiversity Company**

Cell: +27 81 319 1225

Fax: +27 86 527 1965

[info@thebiodiversitycompany.com](mailto:info@thebiodiversitycompany.com)

[www.thebiodiversitycompany.com](http://www.thebiodiversitycompany.com)

<b>Report Name</b>	<b>THE PROPOSED EXPANSION OF RUSTENBURG CHROME MINE'S (RCM) EXISTING OPENCAST PIT AT THEIR EXISTING MINING OPERATIONS NEAR KROONDAL IN THE RUSTENBURG LOCAL MUNICIPALITY IN THE NORTH WEST PROVINCE.</b>	
<b>Specialist Theme</b>	Terrestrial & Aquatic Biodiversity, Soil/Agricultural Themes	
<b>Project Reference</b>	Rustenburg Chrome Mining (Pty) Ltd RCM	
<b>Report Version</b>	Draft 1 / 03/12/2025	
<b>Environmental Assessment Practitioner</b>		
<b>Terrestrial Fieldwork &amp; Report Contributor</b>	Sarah Newman (Cand Sci. Nat. 158474)	
<b>Soil Fieldwork &amp; Report Contributor</b>	Matthew Mamera (SACNASP 116356)	
<b>Wetland Fieldwork &amp; Report Contributor</b>	Divan van Rooyen (SACNASP 151272)	
<b>Terrestrial Report Writer</b>	Lize Timmerman (Cand. Nat. Sci. 158700)	
<b>Soil Report Writer</b>	Day B Mohlala (SACNASP Pending)	
<b>Wetlands Report Writer</b>	Andrew Husted (SACNASP 400213/11)	
<b>Terrestrial Reviewer</b>	Andine de Villiers (Cand. Sci. Nat. 164894)	
<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>	

## Table of Contents

1	Introduction.....	6
1.1	Background .....	6
1.2	Project Description .....	8
1.3	Scope of Work.....	8
1.4	Assumptions and Limitations .....	8
1.5	Legislative Framework .....	9
2	Fieldwork .....	12
2.1	Field Assessment .....	12
3	Results & Discussion .....	13
3.1	Ecologically Important Landscape Features .....	13
3.2	Biodiversity Field Survey .....	14
3.3	Terrestrial Biodiversity.....	16
3.3.1	Habitat Assessment .....	16
3.3.2	Site Ecological Importance.....	17
3.3.1	Desktop Ecological Sensitivity .....	18
3.3.2	Screening Tool Comparison.....	21
3.4	Aquatic Biodiversity.....	23
3.4.1	Desktop Ecological Sensitivity .....	23
3.4.2	Screening Tool Comparison.....	24
3.5	Soil / Agriculture .....	25
3.5.1	Desktop Information .....	25
3.5.2	Identified Soil Forms .....	27
3.5.3	Desktop Agricultural Sensitivity .....	28
3.5.4	Screening Tool Comparison.....	30
4	Impact Management Actions.....	32
5	Conclusion.....	38
5.1	Impact Statement .....	38
5.2	Specialist Opinion .....	38
6	References .....	40
7	Appendix Items.....	42
7.1	Appendix A – Methods .....	42
7.1.1	Desktop Dataset Assessment .....	42

7.2	Appendix B – Terrestrial Site Ecological Importance .....	44
7.3	Appendix C – Specialist Declaration of Independence .....	48
7.4	Appendix D – Specialist CVs .....	55

## List of Tables

Table 1-1	Terrestrial Biodiversity Compliance Statement information requirements as per the relevant protocol, including the location of the information within this report.....	10
Table 1-2	Aquatic Biodiversity Compliance Statement information requirements as per the relevant protocol, including the location of the information within this report.....	10
Table 3-1	Summary of relevance of the proposed project to ecologically important landscape features .....	13
Table 3-2	Sensitivity summary of the survey points and habitat types delineated within the PAOI..	14
Table 3-3	Table providing descriptions of the habitat units delineated for the PAOI .....	17
Table 3-4	Summary of habitat types delineated within the PAOI.....	17
Table 3-5	Summary of the screening tool vs specialist assigned sensitivities .....	21
Table 3-6	Summary of the screening tool vs specialist assigned sensitivities .....	24
Table 3-7	Soils expected at the respective terrain units within the Ea 3 land type (Land Type Survey Staff, 1972 - 2006).....	26
Table 3-8	Summary of the screening tool vs specialist assigned sensitivities .....	30
Table 4-1	Project specific mitigation measures including requirements for timeframes, roles and responsibilities .....	33
Table 7-1	Summary of Conservation Importance (CI) criteria.....	44
Table 7-2	Summary of Functional Integrity (FI) criteria .....	45
Table 7-3	Matrix used to derive Biodiversity Importance (BI) from Functional Integrity (FI) and Conservation Importance (CI) .....	45
Table 7-4	Summary of Receptor Resilience (RR) criteria .....	46
Table 7-5	Matrix used to derive Site Ecological Importance from Receptor Resilience (RR) and Biodiversity Importance (BI) .....	46
Table 7-6	Guideline for interpreting Site Ecological Importance in the context of proposed activities .....	47

## List of Figures

Figure 1-1	Map illustrating the regional context of the Project Area of Influence (PAOI). .....	7
Figure 1-2	Map illustrating the PAOI. ....	7
Figure 2-1	Map illustrating the field survey tracks and points .....	12
Figure 3-1	Habitats identified within the PAOI .....	16
Figure 3-2	Terrestrial Biodiversity Theme Sensitivity .....	19
Figure 3-3	Relative Plant Species Theme Sensitivity .....	20
Figure 3-4	Relative Animal Species Theme Sensitivity .....	21
Figure 3-5	Map illustrating the site ecological importance (SEI) for the PAOI.....	22
Figure 3-6	Aquatic Biodiversity Theme Sensitivity.....	24
Figure 3-7	Summarised climate for the region (Mucina & Rutherford, 2006). ....	25
Figure 3-8	Illustration of land type Ea 3 terrain units (Land Type Survey Staff, 1972 - 2006).....	26
Figure 3-9	Land types present within the RCM Opencast Area 3 Project's surroundings .....	26
Figure 3-10	Soil forms identified within representative hillslope transects .....	27
Figure 3-11	Diagnostic soil horizons identified on-site: A) Mispah. B) Witbank soil form. C) Acadia soil form. ....	28
Figure 3-12	Agricultural Theme Sensitivity .....	29
Figure 3-13	Overall sensitivity of the project area.....	31

## 1 Introduction

### 1.1 Background

The Biodiversity Company (TBC) was appointed to undertake a terrestrial, aquatic biodiversity and agricultural compliance statement for the proposed expansion of the existing Rustenburg Chrome Mining (Pty) Ltd (RCM) opencast pit project. The project site is located approximately 12 km east of the town of Rustenburg. The site is located in the North West Province. The proposed project is found within the Rustenburg Local Municipality and the Bojanala Platinum District Municipality. The Project Area of Influence (PAOI) refers to the project components within the designated property boundary and relates to the Project Area. 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.

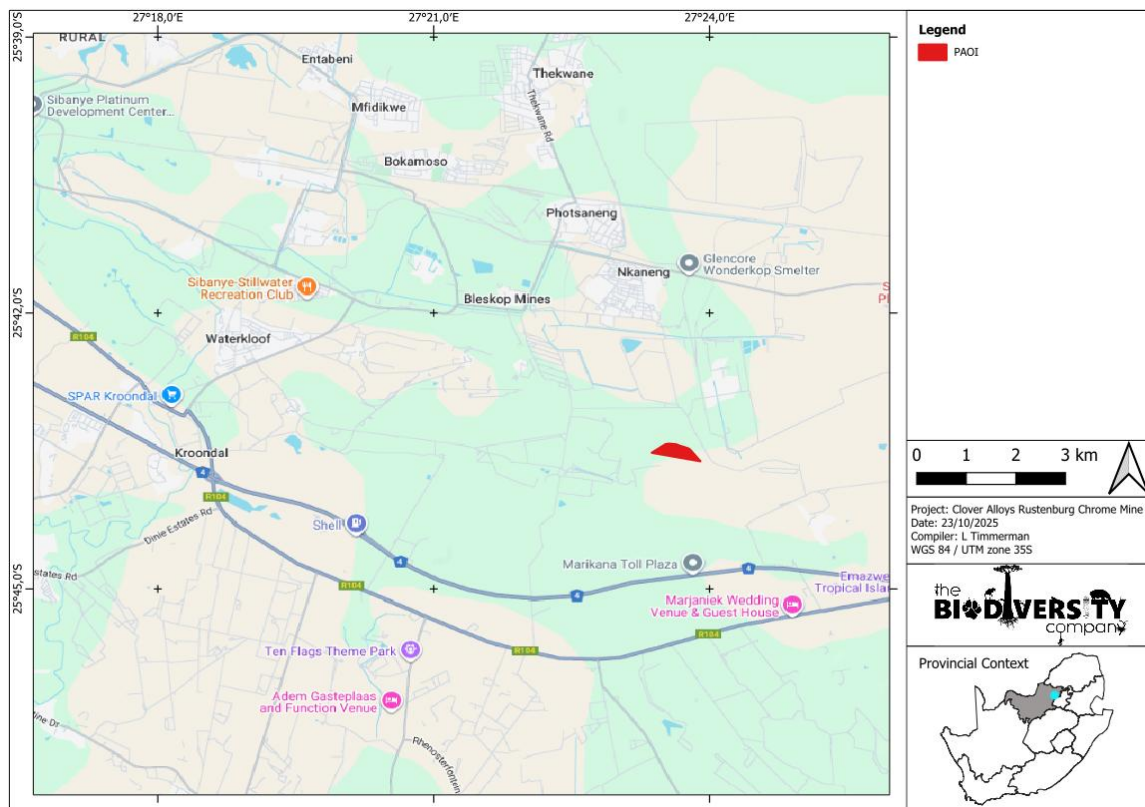
To determine the baseline ecological state of the area and to present a detailed description of the receiving environment, both a desktop assessment, as well as a field survey from the 14<sup>th</sup> to the 15<sup>th</sup> of April 2025, was conducted. Furthermore, the desktop assessment and field survey 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 (No. 326, 7 April 2017) of the National Environmental Management Act (NEMA), 1998 (Act No. 107 of 1998). The approach has taken cognisance of the recently published Government Notice 320 in terms of NEMA dated 20 March 2020 as well as the Government Notice 1150 in terms of NEMA dated 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". The National Web based Environmental Screening Tool has characterised the sensitivities as follows (National Environmental Screening Tool, 2024):

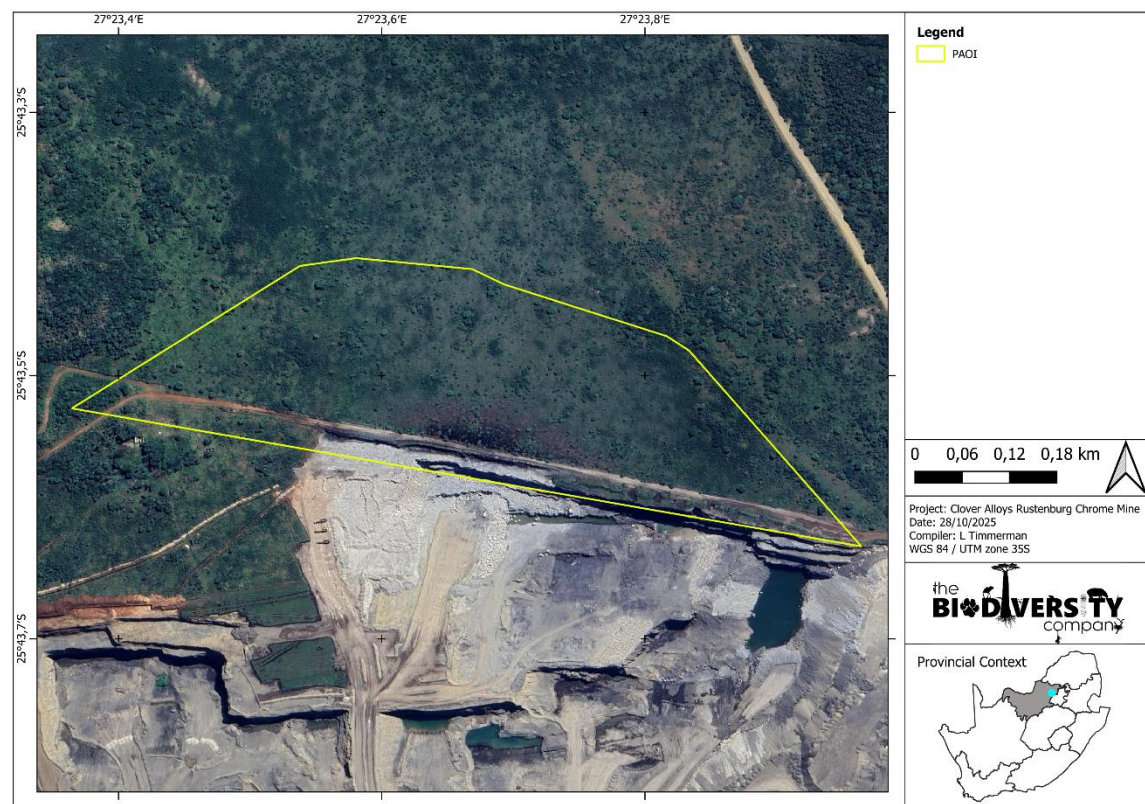
- Terrestrial Biodiversity Theme is 'Very High' for the PAOI;
- Plant Species Theme sensitivity is 'Low' for the PAOI;
- Animal Species Themes sensitivity is 'Medium' for the PAOI;
- Aquatic Biodiversity Theme sensitivity is 'Low' for the PAOI; and
- Agricultural Theme is 'Very High' for the PAOI.

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 and agricultural viability of the proposed project.





**Figure 1-1** Map illustrating the regional context of the Project Area of Influence (PAOI).



**Figure 1-2** Map illustrating the PAOI.



## 1.2 Project Description

The Applicant owns and operates the Rustenburg Chrome Mine and intends expanding the opencast pit that has not previously been authorised.

The current operations at RCM include *inter alia*:

- Underground mining operations;
- Opencast mining area;
- Rehabilitated Pepsi Dam, Lined Dam, 2 x existing Pollution Control Dams (PCDs);
- Tailings Storage Facility (TSF);
- Waste Rock Dump (WRD);
- Gravity plant area; and
- Heavy Medium Separation (HMS) plan.

The new activity that is being applied for as part of this application and that will be assessed in this report is limited to the expansion of the existing opencast pit to the north (Area 3), which is approximately 16 ha in extent. This new area will be a contiguous and a continuous extension to the current open cast pit and the continuation of the existing open cast mining operations.

## 1.3 Scope of Work

The aim of the biodiversity and agricultural 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 SCC, and delineate habitats;
- Determination of the Site Ecological Importance (SEI), also commonly referred to as sensitivity;
- Determination of the agricultural 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 Geographic Information System (GIS) information pertaining to the assessment area would have affected the area surveyed and hence the results of this assessment;

- The project description was based on information provided by the client, and any alterations to the area and/or missing data pertaining to the development would have affected the area surveyed and hence the results of this assessment;
- Invertebrates, and avifauna do not form part of the scope of work for this assessment;
- The area was surveyed during a single site visit, therefore, this assessment does not consider temporal trends;
- The current report is based on a site survey conducted from the 14<sup>th</sup> to the 15<sup>th</sup> of April 2025, undertaken for a previously defined PAOI. This survey was conducted during the early dry season, and as such, certain flora and fauna may not have been present or observable due to seasonal constraints. The newly delineated PAOI overlaps only with the northern section of the original PAOI. Due to access restrictions during the initial survey, the findings presented herein are based on representative sampling, with data extrapolated from the previous survey;
- 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; and
- The Global Positioning System (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 PAOI is of an overall 'Low' and 'Very 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.

Section 1.1.2 and 3.2 of the Aquatic Biodiversity Protocol stipulate that:

- An applicant intending to undertake an activity on a site identified by the Screening Tool as being of "Low Sensitivity" for aquatic biodiversity must submit an Aquatic Biodiversity Compliance Statement; and
- Where a site sensitivity verification confirms that the actual site conditions correspond to "Low Sensitivity", such a compliance statement is required in place of a full specialist assessment

A site sensitivity verification, comprising both a desktop assessment and an on-site inspection, was undertaken to verify the aquatic biodiversity sensitivity of the PAOI. The findings confirmed that no

natural aquatic ecosystems of ecological importance or sensitivity remain within the PAOI, and that any aquatic features present are highly modified, isolated, or artificial in nature. Accordingly, the area is verified as being of overall “Low” sensitivity for aquatic biodiversity.

Therefore, this report constitutes a terrestrial and aquatic biodiversity Compliance Statement as prescribed by the gazetted protocol, fulfilling the requirements outlined under Table 1-1 and Table 1-2.

**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	3.1
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	3.3.2
In the case of a linear activity, confirmation from the terrestrial biodiversity specialist that, in their opinion, based on the mitigation and remedial measures proposed, the land can be returned to the current state within two years of completion of the construction phase	N/A
Proposed impact management outcomes or monitoring requirements for inclusion in the EMP	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

**Table 1-2** *Aquatic 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 verify the sensitivities of the aquatic biodiversity features on site, including relevant equipment and modelling used	7.1
Description of assumptions made, as well as any uncertainties or gaps in knowledge or data	1.4
A baseline profile description of the aquatic biodiversity and ecosystems of the site	3.1
Site sensitivity verification: Desktop analysis using satellite imagery and available aquatic datasets	3.1
A statement on the duration, date, and season of the site inspection and the relevance of the season to the outcome of the assessment	3.2
Site sensitivity verification: On-site inspection, including description of aquatic features (e.g. wetlands, channels, drainage lines), current land use, and degree of modification	3.2
Site sensitivity verification: Photographs and other evidence confirming environmental sensitivity	3.2
Screening tool confirmation/dispute: Verification that the site is of “Low” sensitivity for aquatic biodiversity, based on field verification	3.3.2

## Rustenburg Chrome Mining (Pty) Ltd RCM

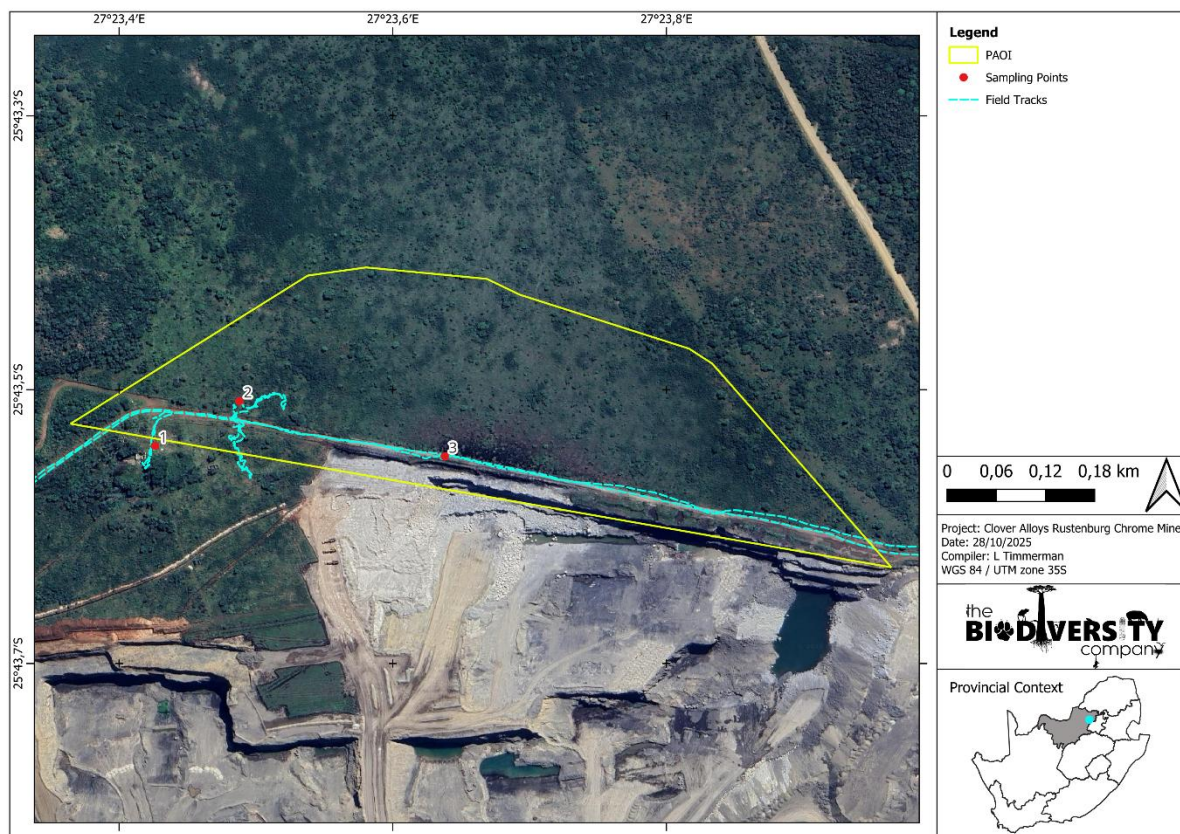
In the case of a linear activity, confirmation from the aquatic biodiversity specialist that, in their opinion, and based on proposed mitigation and remedial measures, the land can be returned to its current state within two years of completion of the construction phase	N/A
Proposed impact management outcomes or any monitoring requirements for inclusion in the EMPr	N/A
Indicate whether or not the proposed development will have any impact on aquatic features or associated biodiversity.	None
A signed statement of independence by the specialist	7.3
Specialist details, including SACNASP registration number, field of expertise, and CV	7.4

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

## 2 Fieldwork

### 2.1 Field Assessment

A field survey for the area was undertaken on the 14<sup>th</sup> and 15<sup>th</sup> of April 2025 (autumn), which constitutes an early dry season survey, 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 (Figure 2-1). Please note the field survey was conducted for a previously PAOI. Due to access restrictions during the initial survey, the findings presented herein are based on representative sampling, with data extrapolated from the previous survey.



**Figure 2-1** Map illustrating the field survey tracks and points

### 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
Screening Tool	Relevant	The screening tool indicated no flora SCC are expected to occur within the PAOI, however, three (3) animals SCC [viz. two (2) mammals and one (1) avifauna] may occur.
Ecosystem Threat Status	Relevant	Overlaps with Endangered (EN) ecosystems (RLE, 2022).
Ecosystem Protection Level	Relevant	Overlaps with Poorly Protected (PP) ecosystems (NBA, 2018).
Provincial Conservation Plan	Relevant	Overlaps with Critical Biodiversity Area (CBA) 2 and Ecological Support Area (ESA) 2 (READ, 2015).
South African Protected and Conservation Areas Databases (SAPAD & SACAD)	Relevant	Located within a SACAD Area viz. Magaliesberg Biosphere Reserve Transition Zone (SAPAD & SACAD, 2025).
National Protected Areas Expansion Strategy (NPAES)	Relevant	Overlaps with NPAES Priority Focus Areas (NPAES, 2018).
Key Biodiversity Areas (KBA)	Relevant	Located within ca. 2.2 km of the Magaliesberg KBA (2024).
South African Inventory of Inland Aquatic Ecosystems (SAIIAE)	Irrelevant	There are no NBA wetlands that occur within the 500 m regulated area of the PAOI (NBA, 2018).
National Freshwater Priority Area (NFEPA)	Relevant	There are no non-priority FEPA wetlands within the 500 m regulated area of the PAOI (NFEPA, 2011).
Strategic Water Source Area (SWSA)	Relevant	Overlaps with the Kroondal/Marikana Groundwater Strategic Water Source Area (SWSA, 2018).
Mining and Biodiversity Guidelines	Relevant	The PAOI is of medium and high Biodiversity Importance (BI), therefore, there is a correlating medium and high risk for mining (Mining & Biodiversity Guidelines, 2013).



### 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 from the 14<sup>th</sup> to the 15<sup>th</sup> of April 2025 (autumn, early dry season). Each sample point is described in Table 3-2.

**Table 3-2 Sensitivity summary of the survey points and habitat types delineated within the PAOI**

Survey Point	Habitat	SEI (Post-mitigation)	Photograph
Site GPS Reference: 01 Date: 15/04/2025 GPS Coordinates: 25°43'35.78"S 27°23'17.03"E	<b>Modified</b> Historically a human settlement that has become overrun by alien and invasive plant species, such as <i>Ipomoea purpurea</i> , <i>Xanthium strumarium</i> , <i>Datura ferox</i> and <i>Datura stramonium</i> . Indigenous species include <i>Solanum lichtensteinii</i> , <i>Aristida diffusa</i> and <i>Dichrostachys cinerea</i> . No flora or fauna SCC were recorded or are expected.	Very Low	
Site GPS Reference: 02 Date: 15/04/2025 GPS Coordinates: 25°43'30.45"S 27°23'28.75"E	<b>Degraded Thornveld</b> Thornveld habitat that has experienced severe levels of degradation due to the ongoing mining activities in close proximity. It experiences infestations by alien and invasive plant species and bush encroachment by <i>Vachellia tortilis</i> and <i>Dichrostachys cinerea</i> . This area is also used as a through-route into the mine by Zama Zamas. In addition to the two species above, dominant species include, <i>Themeda triandra</i> , <i>Hyparrhenia hirta</i> , <i>Cymbopogon caesius</i> , <i>Heteropogon contortus</i> , <i>Aristida diffusa</i> and <i>Aloe davyana</i> . No flora or fauna SCC were recorded or are expected.	Low	



	<b>Modified</b>	
Site GPS	Active opencast mining pit	
Reference:	where no natural	
03	vegetation remains.	
Date:	Impacts associated with	
15/04/2025	this habitat are extremely	Very Low
GPS	high and affect the	
Coordinates:	surrounding natural	
25°43'32.63"S	habitats.	
27°23'36.85"E	No flora or fauna SCC were	
	recorded or are expected	



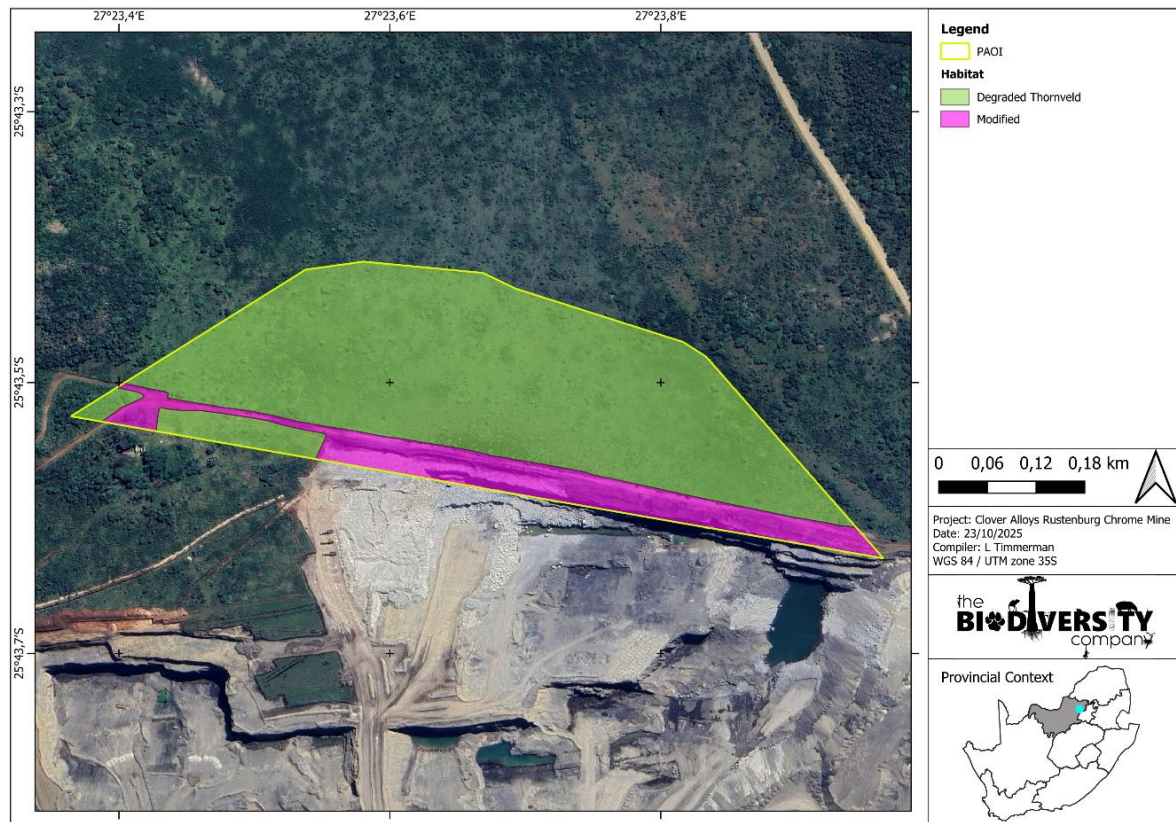
### 3.3 Terrestrial Biodiversity

#### 3.3.1 Habitat Assessment

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

- Degraded Thornveld; 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 3-3.



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

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

Habitat	Description and Condition
Degraded Thornveld	<p>This habitat unit is characterised by thornveld habitat that has experienced severe levels of degradation owing to the ongoing mining activities in the area, as well as nearby agricultural practices. This habitat unit exists in small, fragmented patches that experience frequent human ingress, and the associated impacts, such as littering and illegal dumping. Bush encroachment by <i>Dichrostachys cinerea</i> and <i>Vachellia tortilis</i> in some areas is so dense that it is impenetrable.</p> <p>This habitat unit also experiences invasions and infestations by alien and invasive plant species, such as <i>Tagetes minuta</i>, <i>Bidens pilosa</i>, <i>Solanum seaforthianum</i>, <i>Xanthium strumarium</i>, <i>Datura ferox</i>, <i>Argemone ochroleuca</i>, <i>Datura stramonium</i>, <i>Campuloclinium macrocephalum</i>, <i>Tecoma stans</i>, <i>Flaveria bidentis</i>, <i>Lantana camara</i>, <i>Ipomoea purpurea</i> and <i>Melia azedarach</i>.</p> <p>This habitat unit has lost much of its functionality and can be considered a poor representation of the Marikana Thornveld which it once was. Without active rehabilitation, it will continue to degrade further until it eventually loses all functionality, as it has done in some of the fragments within the mine boundary.</p> <p>Dominant species within this habitat unit, apart from those listed above, include; <i>Themeda triandra</i>, <i>Aristida congesta</i>, <i>Paspalum urvillei</i>, <i>Aristida diffusa</i>, <i>Hyparrhenia hirta</i>, <i>Setaria sphacelata</i>, <i>Cymbopogon caesius</i>, <i>Heteropogon contortus</i>, <i>Hilliardiella elaeagnoides</i>, <i>Aloe davyana</i> and <i>Vachellia robusta</i>.</p> <p>No flora or fauna SCC were recorded and none are expected for this habitat unit.</p>
Modified	<p>This habitat unit includes all areas that maintain little to no native vegetation and/or where anthropogenic activity has substantially modified an area's primary ecological functions and species composition. Within the PAOI, these areas are mostly comprised of active mining areas, the associated infrastructure, existing roads and agricultural fields. These areas include very few, if any, indigenous species and are associated with alien and invasive plant species.</p> <p>No fauna or flora SCC were observed, and none are expected for the habitat unit.</p>

### 3.3.2 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 3-3 and **Error! Reference source not found.**). This indicates that the findings of this assessment are contrary to the Screening Tool with respect to the Combined Terrestrial Biodiversity Theme sensitivity.

**Table 3-4 Summary of habitat types delineated within the PAOI**

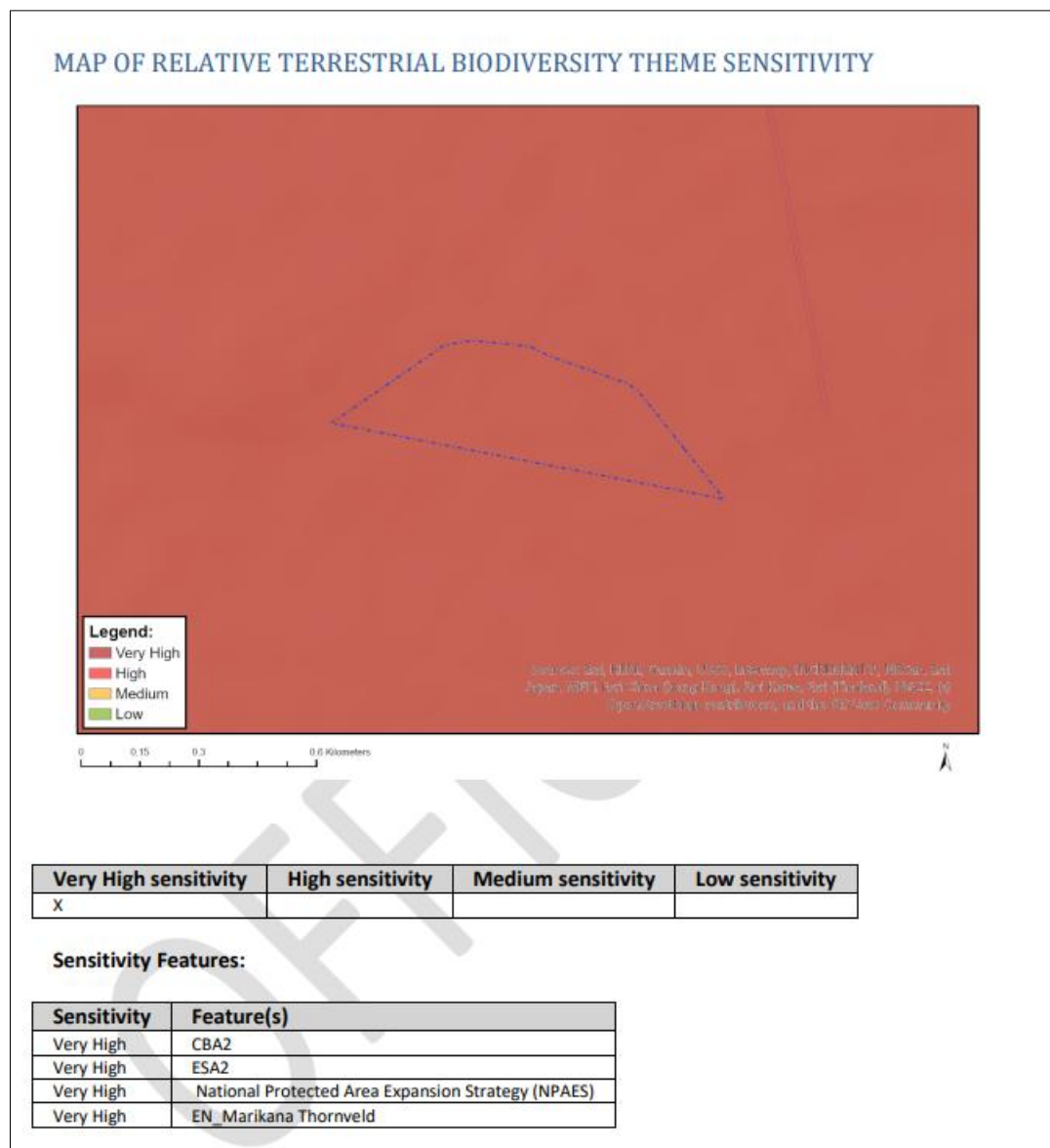
Habitat Type	Conservation Importance	Functional Integrity	Biodiversity Importance	Project Component in relation to habitat type	Receptor Resilience	Site Ecological Importance Guidelines
	High	Low	Medium		High	Low

<b>Degraded Thornveld</b>	Small area (> 0.01% but < 0.1% of the total ecosystem type extent) of natural habitat of EN ecosystem type	Almost no habitat connectivity but migrations still possible across some modified or degraded natural habitat and a very busy road network surrounds the area.		Mining Infrastructure	Habitat that can recover relatively quickly (~ 5–10 years) to restore > 75% of the original species composition and functionality of the receptor	Minimisation and restoration mitigation – development activities of medium to high impact acceptable followed by appropriate restoration activities.
	<b>Very Low</b>	<b>Low</b>			<b>High</b>	<b>Very Low</b>
<b>Modified</b>	No natural habitat remaining.	Several minor and major current negative ecological impacts.	<b>Very Low</b>	Mining Infrastructure	Habitat that can recover relatively quickly (~ 5–10 years) to restore > 75% of the original species composition and functionality of the receptor	Minimisation mitigation – development activities of medium to high impact acceptable and restoration activities may not be required.

### 3.3.1 Desktop Ecological Sensitivity

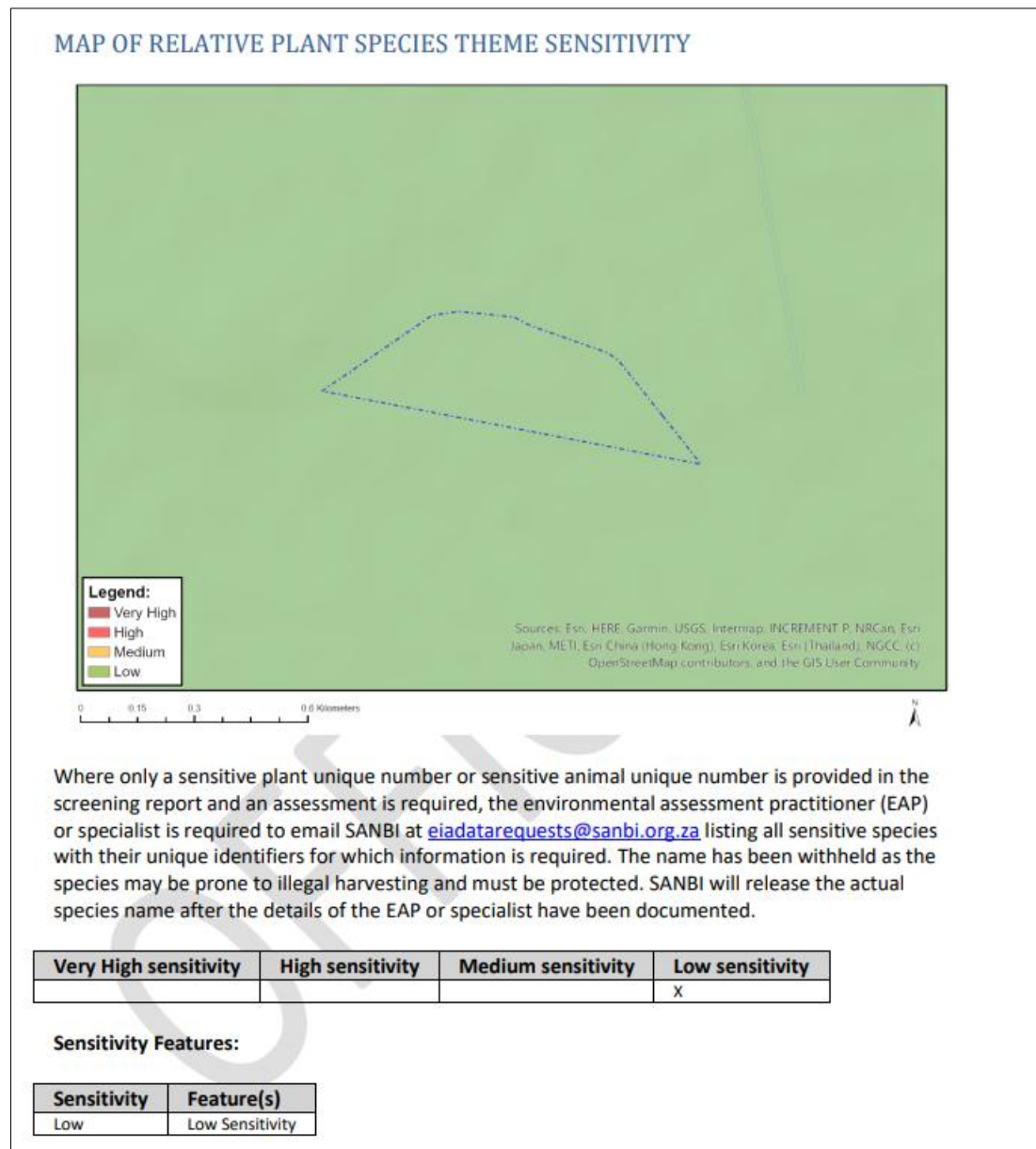
The following is deduced from the National Web-based Environmental Screening Tool Regulation 16(1)(v) of the Environmental Impact Assessment Regulations 2014, as amended):

- Terrestrial Biodiversity Theme sensitivity is Very High for the PAOI due to the possible presence of a CBA 2, ESA 2, NPAES and Endangered Marikana Thornveld Ecosystem (Figure 3-2);
- Plant Species Theme sensitivity is Low for the PAOI (Figure 3-3); and
- Animal Species Theme sensitivity is Medium for the PAOI due to the possible presence of two (2) medium sensitivity mammal species and one (1) medium sensitivity avifauna species (Figure 3-4).

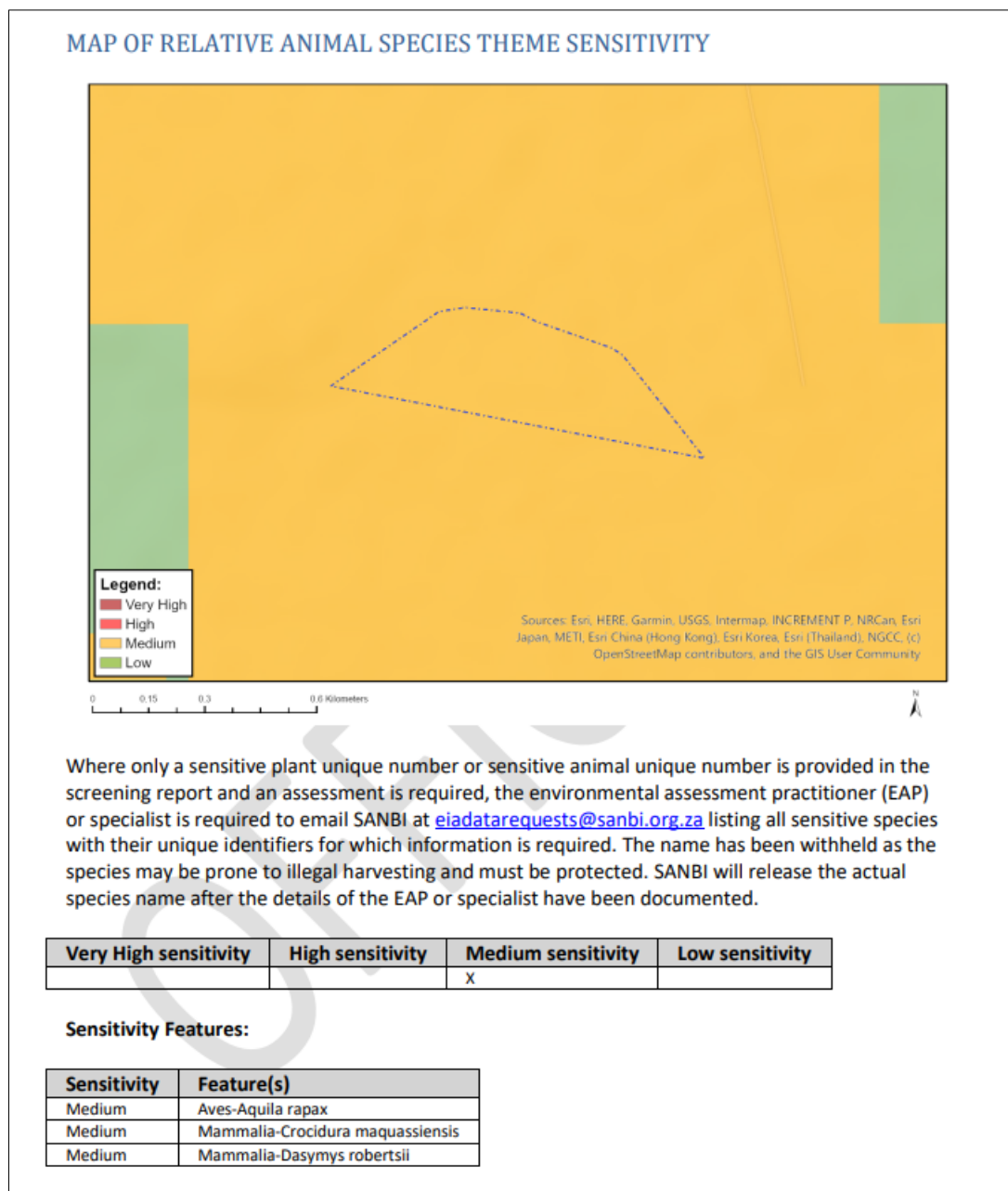


**Figure 3-2 Terrestrial Biodiversity Theme Sensitivity**





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



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

### 3.3.2 Screening Tool Comparison

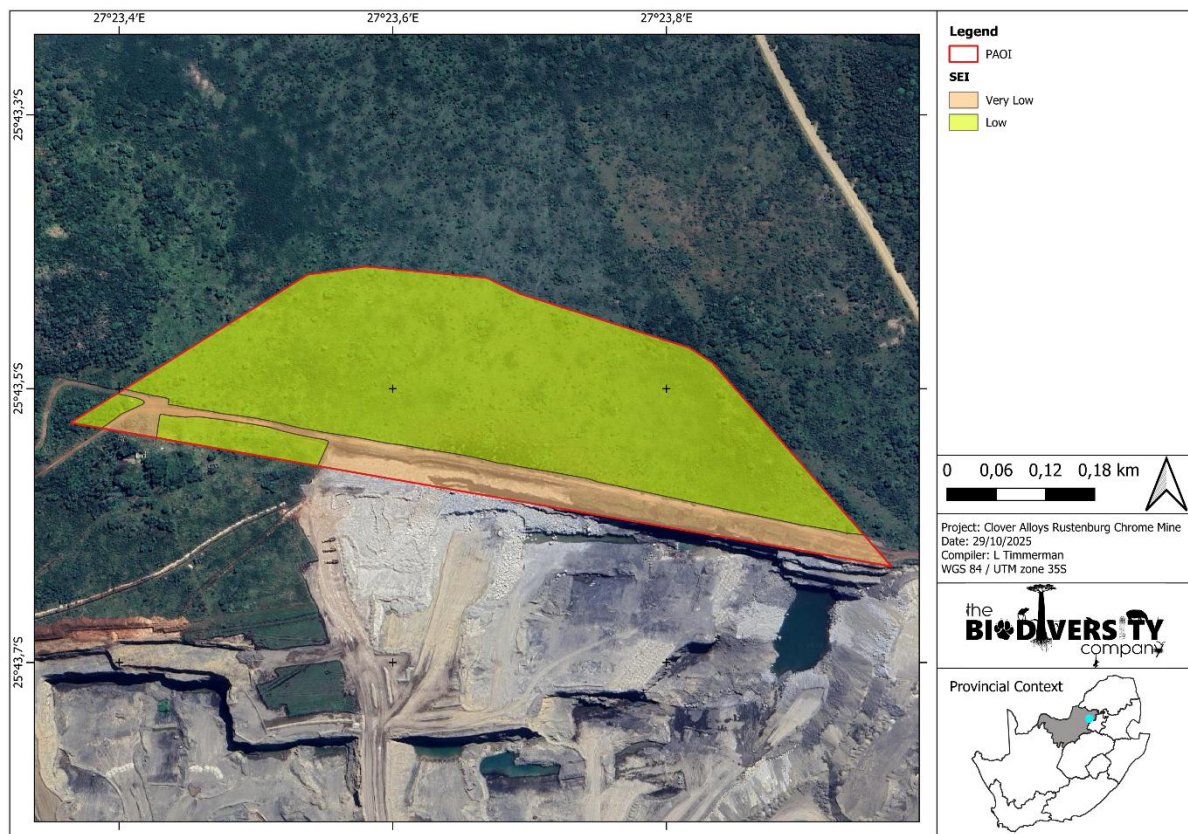
The allocated sensitivities for each of the relevant themes are either disputed or validated for the overall PAOI in Table 3-5 below. A summative explanation for each result is provided as relevant. The specialist-assigned sensitivity ratings are based largely on the SEI process followed in the previous section, and consideration is given to any observed or likely presence of SCC or protected species. A map illustrating the overall SEI allocations for the PAOI can be seen in Figure 3-5. **Error! Reference source not found..**

**Table 3-5 Summary of the screening tool vs specialist assigned sensitivities**

Screening Tool Theme	Screening Tool	Habitat	Specialist	Tool Validated or Disputed by Specialist - Reasoning
Animal Theme	Medium	-	Low	Disputed – Habitats on site are severely degraded or modified and provide little to no suitable habitat for indigenous species, let alone



				SCCs. High levels of human presence provide a constant deterrent, along with the ongoing mining practices which result in noise pollution, in addition to all other pollution. No SCC were recorded or are expected.
<b>Plant Theme</b>	<b>Low</b>	<b>-</b>	<b>Low</b>	Confirmed – Habitats on site are severely degraded or modified and provide little to no suitable habitat for SCCs. The ongoing mining practices result in dustfall, in addition to all other pollution. All habitats are associated with invasions and/or infestations by alien and invasive plant species, contributing to the degraded state of the habitats on site. No SCC were recorded or are expected.
<b>Terrestrial Biodiversity Theme</b>	<b>Very High</b>	<b>Degraded Thornveld</b>	<b>Low</b>	Disputed – Habitat is severely degraded and provides little to no suitable habitat for SCCs. Ongoing mining practices prevent the recovery of this unit, and without human intervention and active rehabilitation, this unit will continue to degrade. It has lost much of its functionality.
		<b>Water Resource</b>	<b>Low</b>	Confirmed – No natural water resources identified for the project.
		<b>Modified</b>	<b>Very Low</b>	Disputed – Habitat modified in nature, predominantly made up of mining infrastructure and agricultural fields. Very limited to no functionality remains.



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

### **3.4 Aquatic Biodiversity**

A site sensitivity verification, comprising both a desktop assessment and an on-site inspection, was undertaken to confirm the aquatic biodiversity sensitivity within the PAOI. The assessment considered the presence of wetlands, drainage lines, rivers, pans, or any other natural aquatic features, as well as artificial or modified waterbodies.

The verification confirmed that no wetlands, drainage lines, or natural water resources occur within or adjacent to the proposed development footprint. The area is highly modified as a result of historical and ongoing land use activities, and no natural hydrological connectivity or surface water features remain. Any localised depressions or altered drainage features identified on satellite imagery were verified in the field to be non-functional, isolated, and artificial in origin.

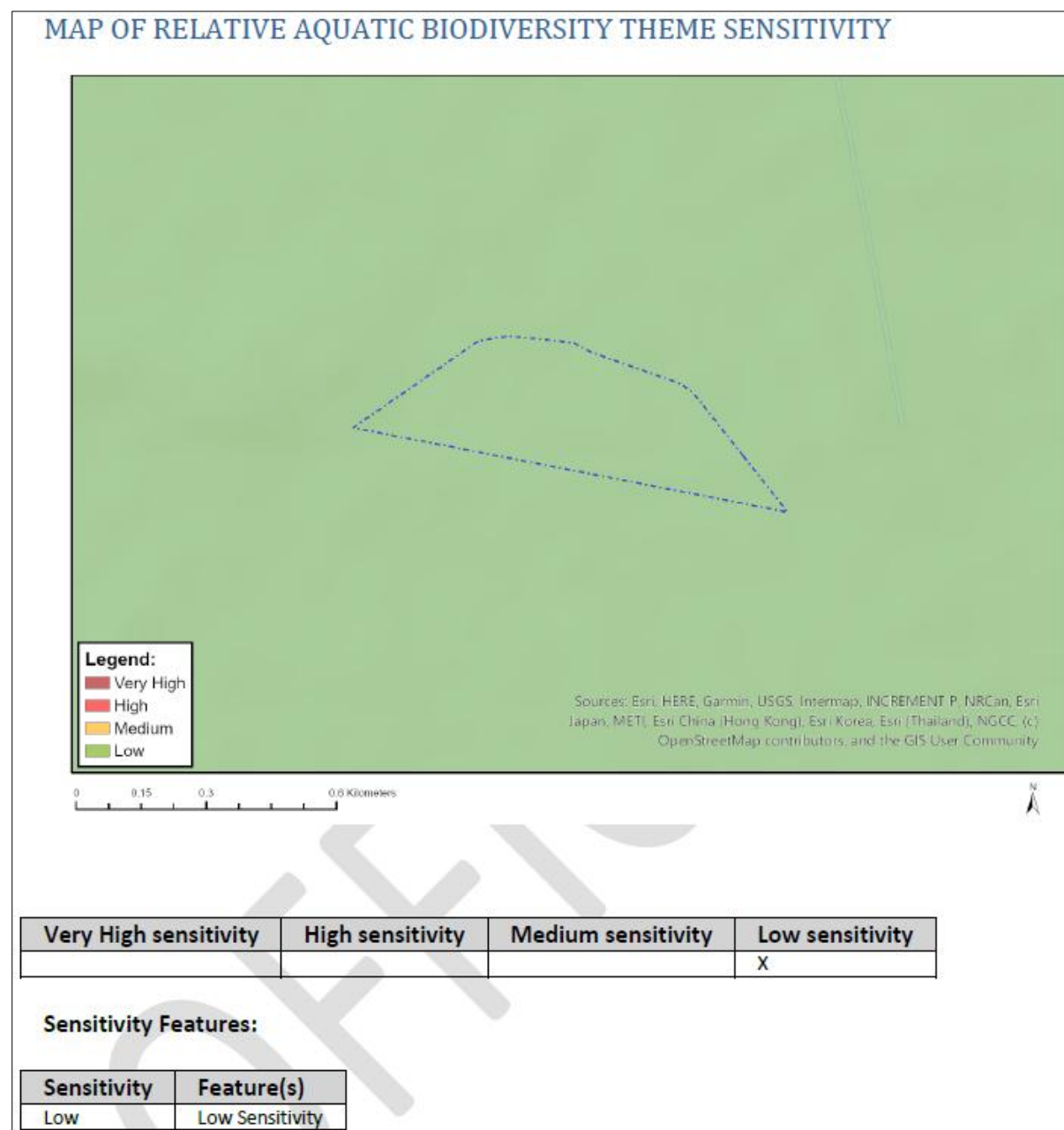
Accordingly, the PAOI is verified as being of “Low” aquatic biodiversity sensitivity in terms of the Gazetted Protocol for the Specialist Assessment and Minimum Report Content Requirements for Environmental Impacts on Aquatic Biodiversity (Government Notice 320 of 20 March 2020).

Given the absence of any natural or functional aquatic ecosystems, no further functional assessment, aquatic biodiversity specialist study, or impact assessment is applicable or required. This document therefore constitutes an Aquatic Biodiversity Compliance Statement as defined under Section 3 of the above-mentioned protocol.

#### **3.4.1 Desktop Ecological Sensitivity**

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):

- Aquatic Biodiversity Theme sensitivity is Low for the PAOI (Figure 3-2).



**Figure 3-6 Aquatic Biodiversity 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 3-5 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 or protected species. A map illustrating the overall SEI allocations for the PAOI can be seen in **Error! Reference source not found.**

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

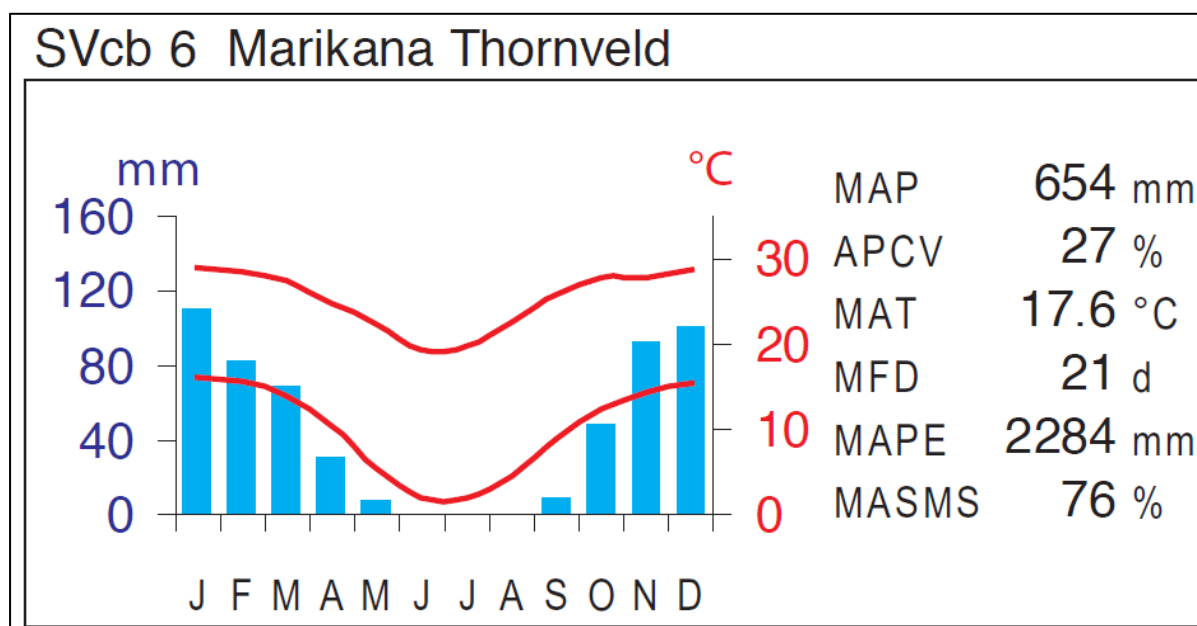
Screening Tool Theme	Screening Tool	Habitat	Specialist	Tool Validated or Disputed by Specialist - Reasoning
Aquatic Biodiversity Theme	Low	Water Resource	Low	Confirmed – No natural water resources identified for the project.

### 3.5 Soil / Agriculture

#### 3.5.1 Desktop Information

##### 3.5.1.1 Climate

The project area falls within the Marikana Thornveld. The area is characterised with a summer rainfall with dry winters. The overall mean average precipitation (MAP) of the proposed project area ranges from 600 - 700 mm. The monthly maximum and minimum temperature for Rustenburg are 35.3°C to -1.4°C in November and January respectively. The area experiences frost frequent in winter (see Figure 3-7).



**Figure 3-7 Summarised climate for the region (Mucina & Rutherford, 2006).**

##### 3.5.1.2 Vegetation

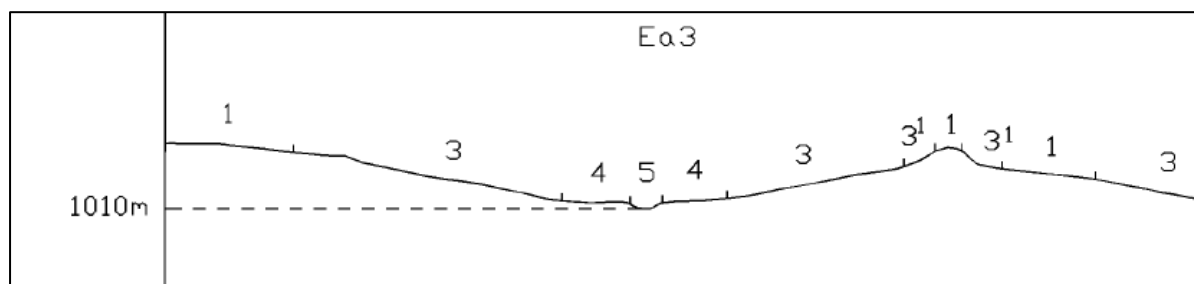
The Marikana Thornveld vegetation is widely distributed in the North West and Gauteng province. The vegetation is found on plains from Rustenburg area in the west, through Marikana and Brits to the Pretoria area in the east. The altitude of this vegetation types is between 1 050 meters above sea level (masl) to 1 450 meters above sea level (Mucina & Rutherford, 2006).

The landscape features include Open *Vachellia karoo* woodland, occurring in valleys and slightly undulating plains, and some lowland hills. Shrubs are denser along drainage lines, on termitaria and rocky outcrops or in other habitat protected from fire (Mucina & Rutherford, 2006).

##### 3.5.1.3 Geology & Soils

The geology of the area includes mafic intrusive rocks of the Rustenburg layered suite of the Bushveld Igneous Complex, gabbro, norite, pyroxenite, anorthosite, shales and quartzites. According to the land type database (Land Type Survey Staff, 1972 - 2006) the transects relevant to the project is located in the Ea 3 (see Figure 3-8 **Error! Reference source not found.** below). The Ea 3 land type mainly consists of Arcadia, Oakleaf soil forms and rocky areas. The Ea land type is characterised by vertic, melanitic, red-structured diagnostic horizons and undifferentiated soils.

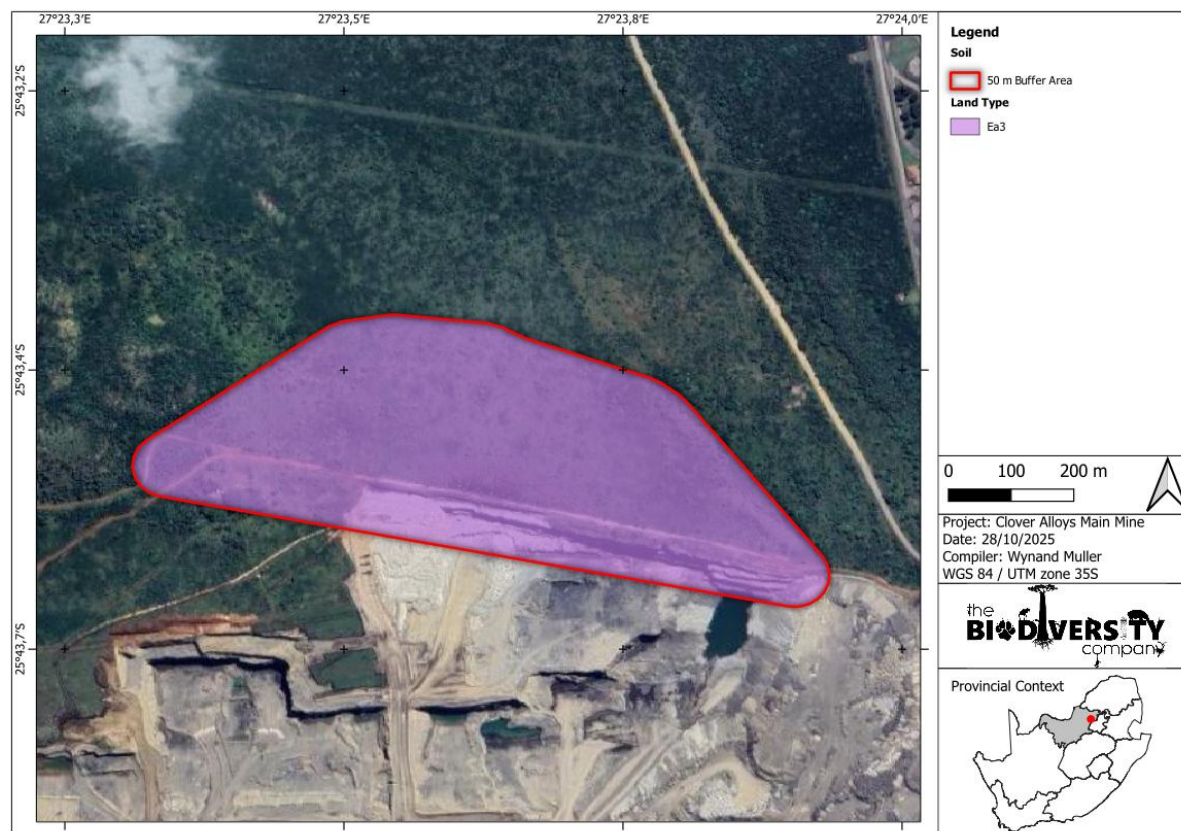




**Figure 3-8** Illustration of land type Ea 3 terrain units (Land Type Survey Staff, 1972 - 2006).

**Table 3-7** Soils expected at the respective terrain units within the Ea 3 land type (Land Type Survey Staff, 1972 - 2006)

Terrain Units									
1 (30%)		1 (0.5%)		3 (44.5%)		4 (15%)		5 (9%)	
Arcadia	70%	Bare Rocks	80%	Arcadia	76%	Arcadia	89%	Oakleaf	67%
Bare rock	14%	Mispah	20%	Bare Rocks	10%	Hutton	3%	Arcadia	22%
Mispah	9%			Mispah	6%	Shortlands	3%	Shortlands	6%
Hutton	4%			Hutton	4%	Swartland	3%	Hutton	5%
Shortlands	3%			Shortlands	3%	Bare Rocks	2%		
				Swartland	1%				

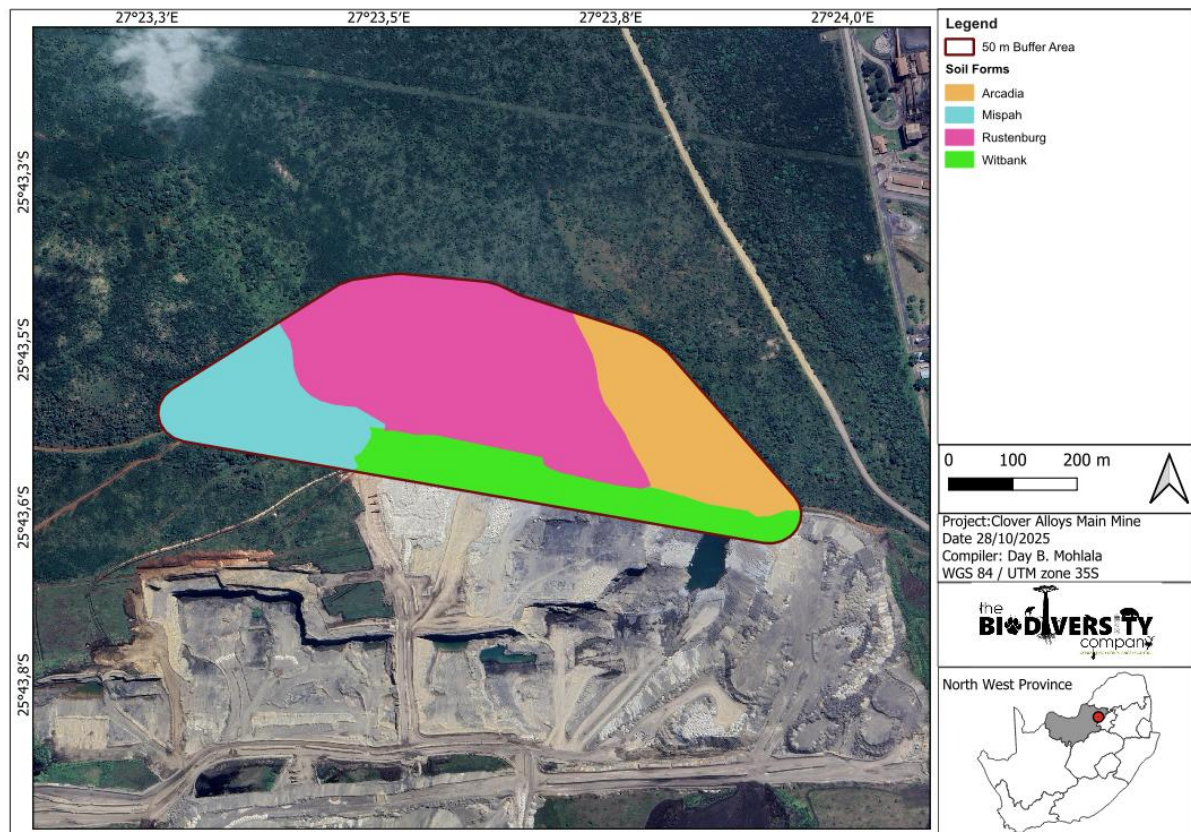


**Figure 3-9** Land types present within the RCM Opencast Area 3 Project's surroundings

### 3.5.2 Identified Soil Forms

The following soil forms were identified on-site whilst surveying the project area;

- Arcadia (Vertic topsoil on top of a lithic horizon below);
- Rustenburg (Vertic topsoil on top of a Hardrock substratum below);
- Mispah (Orthic topsoil on top of a hard rock layer below); and
- Witbank (Transported anthropogenic material from mining activities with some evidence of the original diagnostic horizons or partially processed saprolithic material).



**Figure 3-10** Soil forms identified within representative hillslope transects



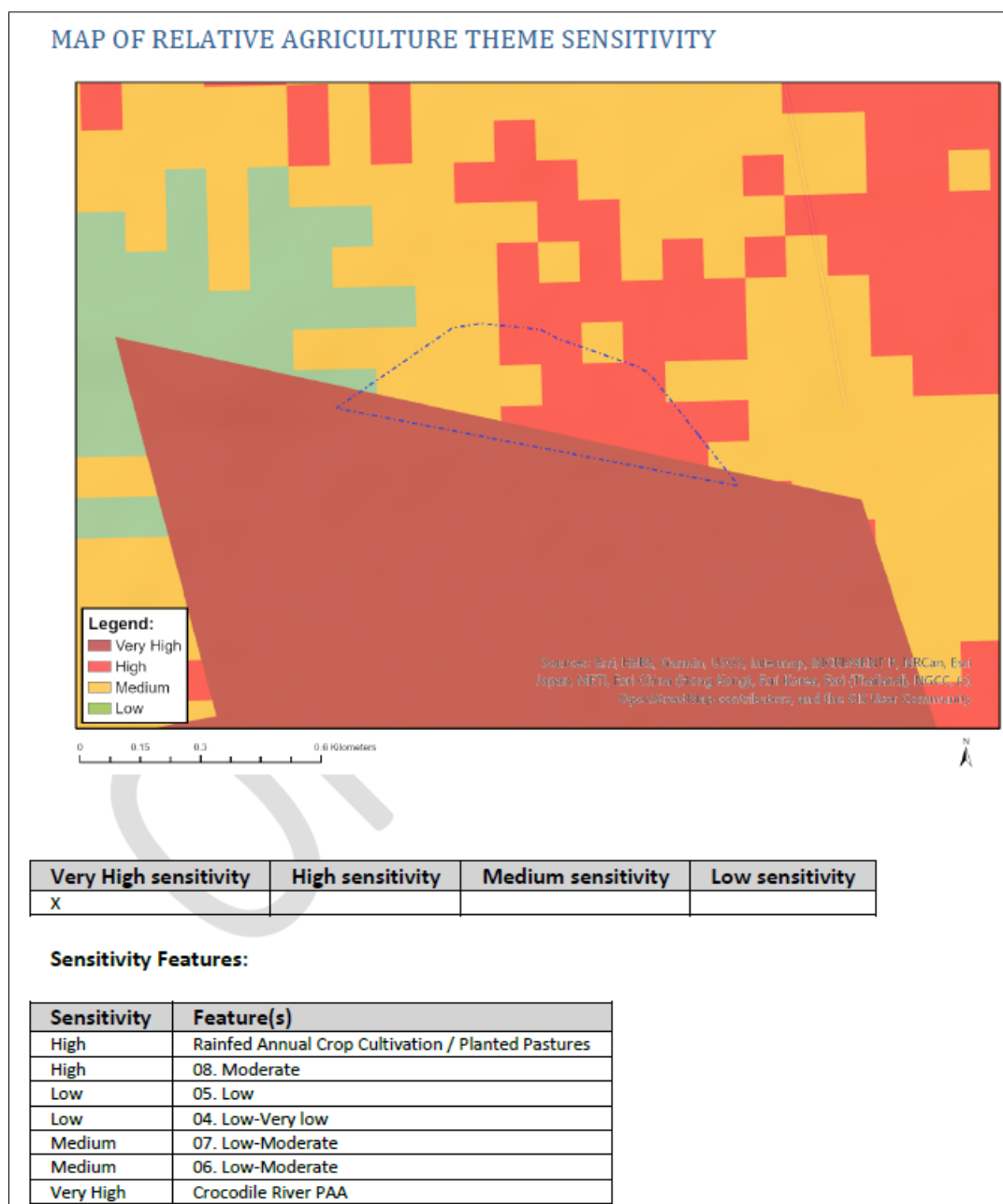
**Figure 3-11** *Diagnostic soil horizons identified on-site: A) Mispah. B) Witbank soil form. C) Acadia soil form.*

### 3.5.3 Desktop Agricultural Sensitivity

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):

- Agriculture Theme Sensitivity indicates that the proposed project area falls within the “Low to Very High” agricultural sensitivity (Figure 3-12Error! Reference source not found.)





**Figure 3-12 Agricultural Theme Sensitivity**

Fifteen land capabilities have been digitised by (DAFF, 2017) across South Africa, of which five potential land capability classes are located within the proposed footprint area's assessment area, including;

- Land Capability 4 to 5 (Very Low to Low Sensitivity);
- Land Capability 6 to 7 (Low-Moderate Sensitivity); and
- Land Capability 8 (Moderate Sensitivity).

Protected Agricultural Area (PAA) is a national or provincial protected agricultural area, contemplated which is a cartographically delineated area of agricultural land that is set aside to ensure the land is safeguarded from non-agricultural land uses. The primary aim is to support long-term agricultural production and maintain food security.

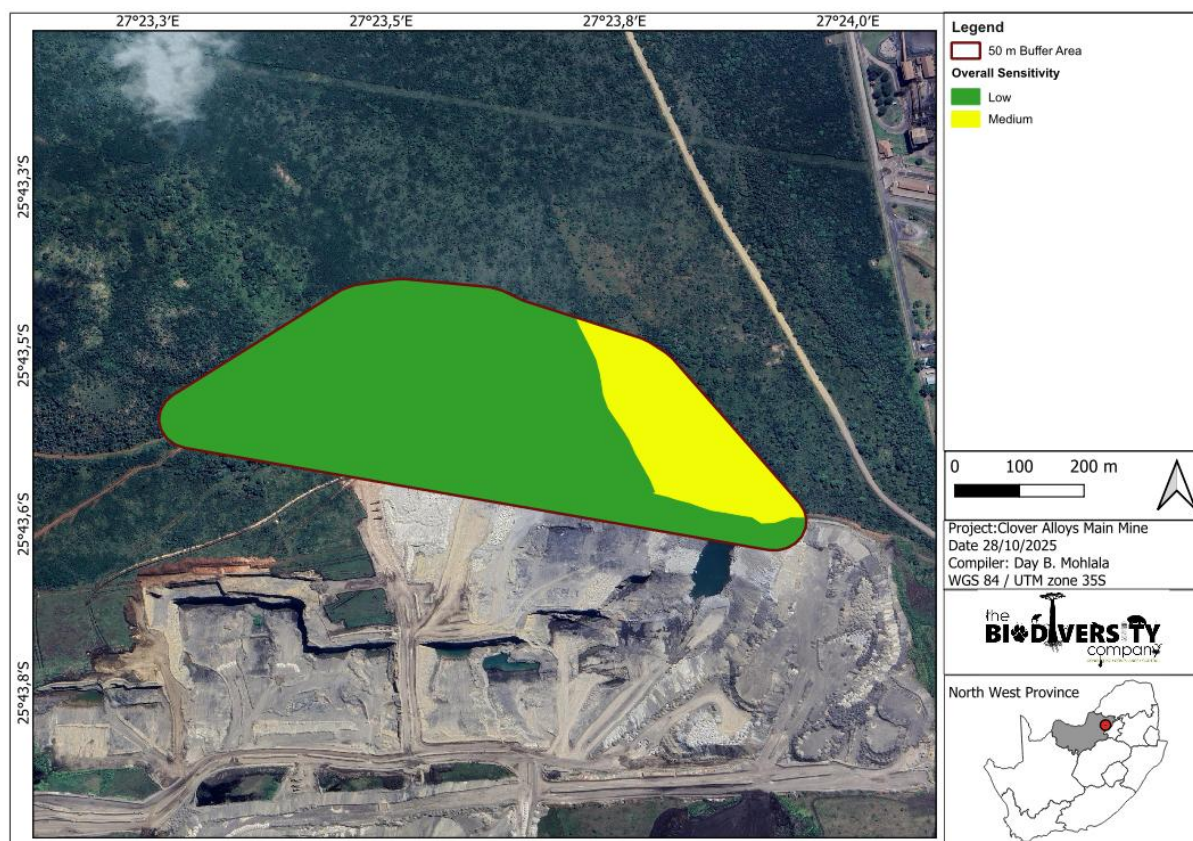
### 3.5.4 Screening Tool Comparison

The allocated sensitivities for the theme are either disputed or validated in Table 3-8 below.

**Table 3-8 Summary of the screening tool vs specialist assigned sensitivities**

Screening Tool Theme	Feature	Screening Tool	Specialist	Tool Validated or Disputed by Specialist - Reasoning
Agricultural Theme	Crocodile River PAA	Very High	Medium	Disputed– Land Capability Low-Moderate. The presence of medium potential soil with some restrictions in drainage, aeration, root penetration and high-water holding capacity such as Arcadia soil form.
	Crocodile River PAA	Very High	Low	Disputed – Land Capability Very Low to Low. Shallow soils with limited profile deep for root penetration and impermeable substratum, including Technosols with low suitability for crop production such as Rustenburg, Mispah and Witbank soil forms.
	Rainfed Annual Crop cultivation/Planted pastures	High	Medium	Disputed– Land Capability Low-Moderate. The presence of medium potential soil with some restrictions in drainage, aeration, root penetration and high-water holding capacity such as Arcadia soil form.
	Rainfed Annual Crop cultivation/Planted pastures	High	Low	Disputed – Land Capability Very Low to Low. Shallow soils with limited profile deep for root penetration and impermeable substratum, including Technosols with low suitability for crop production such as Rustenburg, Mispah and Witbank soil forms.
	LC 8 (Moderate)	High	Medium	Disputed– Land Capability Low-Moderate. The presence of medium potential soil with some restrictions in drainage, aeration, root penetration and high-water holding capacity such as Arcadia soil form.
	LC 8 (Moderate)	High	Low	Disputed – Land Capability Very Low to Low. Shallow soils with limited profile deep for root penetration and impermeable substratum, including Technosols with low suitability for crop production such as Rustenburg, Mispah and Witbank soil forms.
	LC 6 – 7 (Low-Moderate)	Medium	Medium	Validated– Land Capability Low-Moderate. The presence of medium potential soil with some restrictions in drainage, aeration, root penetration and high-water holding capacity such as Arcadia soil form.
	LC 6 – 7 (Low-Moderate)	Medium	Low	Disputed – Land Capability Very Low to Low. Shallow soils with limited profile deep for root penetration and impermeable substratum, including Technosols (soils dominated or strongly influenced by human-made material) with low suitability for crop production such as Rustenburg, Mispah and Witbank soil forms.
	LC 4 – 5 (Very Low to Low)	Low	Medium	Disputed– Land Capability Low-Moderate. The presence of medium potential soil with some restrictions in drainage, aeration, root penetration and high-water holding capacity such as Arcadia soil form.
	LC 4 – 5 (Very Low to Low)	Low	Low	Validated – Land Capability Very Low to Low. Shallow soils with limited profile deep for root penetration and impermeable substratum, including Technosols with low suitability for crop production such as Rustenburg, Mispah and Witbank soil forms.

Considering the verified soil properties, land potential as well as the current land use of the proposed development area, the overall sensitivity of the proposed project area is predominantly “Low” with marginal “Medium” sensitivity (Figure 3-13 **Error! Reference source not found.**).



**Figure 3-13** Overall sensitivity of the project area

## 4 Impact Management Actions

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;
- Adequately follow the guidelines for interpreting the Site Ecological Importance ratings assigned to the PAOI; and
- Enhance the remaining EN vegetation type to the north and north-west of the study area

**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
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
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.	Life of Operation	Project manager, Environmental Officer	Rehabilitation	Ongoing
Pursue options to improve on the remaining EN vegetation types to the north and north-west of the study area falling within the CBA 2 area, by engaging with the landowner/s with the goal of developing and implementing a biodiversity management plan by a registered and qualified ecologist. This plan should include as a minimum active rehabilitation measures and bi-annual alien invasive control and monitoring, as well as annual audits of the plan.	Life of Operation	Project manager, Environmental Officer	Rehabilitation	Ongoing
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	Life of operation	Environmental Officer & Contractor	Spill events, Vehicles dripping.	Ongoing

## Rustenburg Chrome Mining (Pty) Ltd RCM

the surrounding areas. The Contractor shall be in possession of an emergency spill kit that must always be complete and available on site. The water resources must be protected and all activities that could result in a spill should occur away from them.

- Drip trays or any form of oil absorbent material must be placed underneath vehicles/machinery and equipment when not in use.
- No servicing of equipment on site unless necessary.
- All contaminated soil / yard stone shall be treated in situ or removed and be placed in containers.
- 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.
- Construction activities and vehicles could cause spillages of lubricants, fuels and waste material negatively affecting the functioning of the ecosystem.
- All vehicles and equipment must be maintained, and all re-fuelling and servicing of equipment is to take place in demarcated areas outside of the PAOI.

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**Management outcome: Fauna**

Impact Management Actions	Implementation		Monitoring	
	Phase	Responsible Party	Aspect	Frequency
A site walk through and protected flora walkdown must be performed during the correct flowering season (between October and March following sufficient rainfall to prompt flowering) 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



## Rustenburg Chrome Mining (Pty) Ltd RCM

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	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
Any holes/deep excavations must be dug in a progressive manner and should not 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

**Management outcome: Alien Species**

Impact Management Actions	Implementation		Monitoring	
	Phase	Responsible Party	Aspect	Frequency
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



## Rustenburg Chrome Mining (Pty) Ltd RCM

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
<b>Management outcome: Dust</b>				
Impact Management Actions	Implementation		Monitoring	
	Phase	Responsible Party	Aspect	Frequency
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
A dust management plan must be compiled and implemented.	Life of Operation	Project manager, Environmental Officer & Contractor	Dustfall	Dust monitoring program
<b>Management outcome: Waste Management</b>				
Impact Management Actions	Implementation		Monitoring	
	Phase	Responsible Party	Aspect	Frequency
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
<b>Management outcome: Environmental Awareness Training</b>				

Impact Management Actions	Implementation		Monitoring	
	Phase	Responsible Party	Aspect	Frequency
<p>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 in line with the Environmental Authorisation and within the EMP.</p> <p>Contractors and employees must all undergo the induction and must be made aware of any sensitive areas to be avoided.</p>	Pre-construction phase	Health and Safety Officer, Environmental Officer	Compliance to the training	Ongoing
<b>Management outcome: Erosion</b>				
Impact Management Actions	Implementation		Monitoring	
	Phase	Responsible Party	Aspect	Frequency
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
Only existing access routes and walking paths may be made use of. All new roads must be authorised.	Life of operation	Project manager, 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, Environmental Officer	Re-establishment of indigenous vegetation	Progressively
A stormwater management plan must be compiled and implemented.	Life of operation	Project manager, Environmental Officer	Management plan	Before construction phase: Ongoing

## 5 Conclusion

The PAOI exists in a severely degraded state owing to the active mining operations occurring in the area, as well as the surrounding agricultural practices. The natural habitats within the PAOI experience severe and ongoing anthropogenic disturbance which has resulted in their inability to recover to a more functional state. As a result, much of the functionality has been lost and without active human intervention and rehabilitation, these habitats will continue to degrade and are unlikely to recover. Due to the degradation, modification and the fragmented state and small size of the habitats, they do not provide suitable habitat for fauna or flora SCC. It is unlikely that any of these habitats are representative of a CBA, and many of the areas classified as an ESA have already been modified.

Although the habitat is degraded, it should be noted that it is part of a CBA 2 area, which are areas that are planned to be preserved. In order to mitigate/offset the impact and to improve on the remaining EN vegetation types to the north and north-west of the study area falling within the CBA 2 area, mitigation measures should be implemented. It is recommended the mine engages with the landowner/s, with the goal of developing and implementing a biodiversity management plan, inclusive of active rehabilitation measures, bi-annual alien invasive control and monitoring and annual audits of the plan.

The Degraded Thornveld habitat is assigned a 'Low' sensitivity and the Modified habitat a 'Very Low' sensitivity.

Based on the site verification, no wetlands, drainage lines, or natural aquatic features occur within or adjacent to the development footprint. The area is highly modified and of *low aquatic biodiversity sensitivity*; therefore, no further functional or impact assessment is required in accordance with the Aquatic Biodiversity Protocol (GN 320 of 20 March 2020).

The baseline soil findings, current land uses and the calculated land potential dispute the agricultural theme in areas associated with sensitivities ranging from "Very Low to Low", "Low-Moderate" and "Moderate" land capability sensitivities within the project area. They further concur to an extent with "Very Low to Low" and "Low-Moderate" land capability sensitive within the 50 m buffer area of the proposed development. The overall site sensitivity of the project area ranges from 'Low' to 'Medium'.

The ecological integrity, importance and functioning of these terrestrial biodiversity areas is at risk. The rehabilitation and preservation of these systems is the most important aspect to consider for the proposed project.

### 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. The agricultural sensitivity of the project area ranges from Low to Medium and the impacts of the development are considered low. As a result of no aquatic features occurring within the project area the impact of development is expected to be low.

### 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:

- An alien invasion plant (AIP) management plan must be compiled and implemented for the entire PAOI;
- A rehabilitation plan must be compiled and implemented for the entire PAOI;
- A dust management plan must be compiled and implemented for the entire PAOI; and

- A site walkdown and a protected flora walkdown must be conducted during the correct flowering season (between October and March following sufficient rainfall to prompt flowering) prior to the commencement of development activities and all protected flora species must be avoided or the relevant permits must be obtained for activities which may result in the need to translocate, cut/damage, and/or destroy specimens.
- A biodiversity management plan must be compiled and implemented for the entire PAOI.
- Pursue options to improve on the remaining EN vegetation types to the north and north-west of the study area falling within the CBA 2 area by implementing mitigations measures suggested above.

## 6 References

Apps, P. 2000. *Smither's Mammals of Southern Africa – A Field Guide*. Struik Nature, Cape Town.

Bates, M.F., Branch, W.R., Bauer, A.M., Burger, M., Marais, J., Alexander, G.J & de Villiers, M.S. (Eds). 2014. *Atlas and Red List of Reptiles of South Africa, Lesotho and Swaziland. Suricata 1*. South African Biodiversity Institute, Pretoria.

Branch, B. 1998. *Field Guide to Snakes and Other Reptiles of Southern Africa*. Struik Nature, Cape Town.

Department of Forestry, Fisheries and the Environment (DFFE). 2023. SACAD (South Africa Conservation Areas Database) and SAPAD (South Africa Protected Areas Database). <http://egis.environment.gov.za>.

Department of Agriculture, Forestry and Fisheries, 2017. National land capability evaluation raster data: Land capability data layer, 2017. Pretoria.

Department of Forestry, Fisheries and the Environment (DFFE). 2022. National Protected Areas Expansion Strategy <http://egis.environment.gov.za>.

Department of Agriculture Land Reform and Rural Development. 2025. Preservation and Development of Agricultural Land Act (Act 39 of 2024); No. 52009. Pretoria.

Du Preez, L.H. & Carruthers, V. 2009. *A Complete Guide to the Frogs of Southern Africa*. Struik Nature, Cape Town.

Fish, L., Mashau, A.C., Moeaha, M.J. & Nembudani, M.T. 2015. *Identification Guide to Southern African Grasses: An Identification Manual with Keys, Descriptions, and Distributions*. SANBI, Pretoria.

FitzPatrick Institute of African Ornithology. 2024a. MammalMAP Virtual Museum. Accessed at <http://vmus.adu.org.za/?vm=MammalMAP>

FitzPatrick Institute of African Ornithology. 2024b. ReptileMAP Virtual Museum. Accessed at <http://vmus.adu.org.za/?vm=ReptileMAP>

FitzPatrick Institute of African Ornithology. 2024c. FrogMAP Virtual Museum. Accessed at <http://vmus.adu.org.za/?vm=FrogMAP>

Land Type Survey Staff. (1972 - 2006). *Land Types of South Africa: Digital Map (1:250 000 Scale) and Soil Inventory Databases*. Pretoria: ARC-Institute for Soil, Climate, and Water.

Mucina, L. & Rutherford, M.C. (Eds.). 2006. *The vegetation of South Africa, Lesotho and Swaziland*. Strelizia 19. South African National Biodiversity Institute, Pretoria, South African.

Mucina, L., Rutherford, M.C. & Powrie, L.W. (Eds.). 2007. *Vegetation map of South Africa, Lesotho and Swaziland. 1:1 000 000 scale sheet maps*. 2nd ed. South African National Biodiversity Institute, Pretoria.

Mucina, L., Scott-Shaw, C.R., Rutherford, M.C., Camp, K.G.T., Matthews, W.S., Powrie, L.W. and Hoare, D.B. Indian Ocean Coastal Belt. IN Mucina, L. & Rutherford, M.C. (Eds.). 2006. *The vegetation of South Africa, Lesotho and Swaziland*. Strelizia 19. South African National Biodiversity Institute, Pretoria, South African.

National Environmental Screening Tool. 2025. National Environmental Screening Tool, 2025. Available from the Department of Forestry, Fisheries, and the Environment website: <https://screening.environment.gov.za/screeningtool/index.html#/pages/welcome>.

National Biodiversity Assessment spatial data. 2018. <http://bgis.sanbi.org/>. Accessed January 2022.

Nel J.L., Murray K.M., Maherry A.M., Petersen C.P., Roux D.J., Driver A., Hill L., Van Deventer H., Funke N., Swartz E.R., Smith-Adao L.B., Mbona N., Downsborough L. and Nienaber S. 2011. Technical Report for the National Freshwater Ecosystem Priority Areas project. WRC Report No. K5/1801.

NEMBA. 2014. Government Gazette, Volume 584. No 37320. [www.gpwonline.co.za](http://www.gpwonline.co.za). Accessed January 2022.



---

POSA. 2016. Plants of South Africa - an online checklist. **POSA ver. 3.0.** <http://newposa.sanbi.org/>. (Accessed: August 2023).

---

Raimondo, D., von Staden, L., Foden, W., Victor, J.E., Helme, N.A., Turner, R.C., Kamundi, D.A. and Manyama, P.A. 2009. Red List of South African Plants. Strelitzia 25. South African National Biodiversity Institute, Pretoria.

---

SANBI. 2022. Red List of South African Plants version 2020. [redlist.sanbi.org](http://redlist.sanbi.org) (Accessed: May 2023)

---

SANBI-BGIS. 2017. Technical guidelines for CBA Maps: Guidelines for developing a map of Critical Biodiversity Areas & Ecological Support Areas using systematic biodiversity planning.

---

SAPAD (South Africa Protected Areas Database) and SACAD (South Africa Conservation Areas Database) (2023). <http://egis.environment.gov.za>

---

Skinner, J.D. & Chimimba, C.T. 2005. The Mammals of the Southern African Sub-region. Cambridge University Press, Cape Town.

---

Skowno, A.L. & Monyeki, M.S. 2021. South Africa's Red List of Terrestrial Ecosystems (RLEs). Land, 10, 1048, 1-14.

---

Skowno, A.L., Raimondo, D.C., Poole, C.J., Fizzotti, B. & Slingsby, J.A. (eds.). 2019. South African National Biodiversity Assessment 2018 Technical Report Volume 1: Terrestrial Realm. South African National Biodiversity Institute, Pretoria.

---

Smith, B. (2006). The Farming Handbook. Netherlands & South Africa: University of KwaZulu-Natal Press & CTA.

---

Soil Classification Working Group. (1991). Soil Classification A Taxonomic system for South Africa. Pretoria: The Department of Agricultural Development.

---

Soil Classification Working Group. (2018). Soil Classification A Taxonomic system for South Africa. Pretoria: The Department of Agricultural Development.

---

Stuart, C & Stuart, M. A. 2013. Field guide to the tracks & signs of Southern, Central & East African Wildlife. Penguin Random House, Cape Town.

---

Stuart, C & Stuart, M. A. 2015. Stuarts' Field Guide to Mammals of Southern Africa including Angola, Zambia & Malawi. Struik Nature, Cape Town.

---

Taylor A, Cowell C, Drouilly M, Schulze E, Avenant N, Birss C, Child MF. 2016. A conservation assessment of *Pelea capreolus*. In Child MF, Roxburgh L, Do Linh San E, Raimondo D, Davies-Mostert HT, editors. The Red List of Mammals of South Africa, Swaziland and Lesotho. South African National Biodiversity Institute and Endangered Wildlife Trust, South Africa.

---

Taylor, M.R., Peacock, F. & Wanless, R.M. (Eds). 2015. The 2015 Eskom Red Data Book of birds of South Africa, Lesotho and Swaziland. BirdLife South Africa, Johannesburg.

---

Van Deventer H, Smith-Adao L, Collins NB, Grenfell M, Grundling A, Grundling P-L, Impson D, Job N, Lötter M, Ollis D, Petersen C, Scherman P, Sieben E, Snaddon K, Tererai F. and Van der Colff D. 2019. *South African National Biodiversity Assessment 2018: Technical Report*. Volume 2b: Inland Aquatic (Freshwater) Realm. CSIR report number CSIR/NRE/ECOS/IR/2019/0004/A. South African National Biodiversity Institute, Pretoria. <http://hdl.handle.net/20.500.12143/6230>.

---

## 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 North-West Department of Rural, Environment, and Agricultural Development (READ), as custodian of the environment in the North West, is the primary implementing agent of the Biodiversity Sector Plan. The spatial component of the Biodiversity Sector Plan is based on systematic biodiversity planning undertaken by READ. The purpose of a Biodiversity Sector Plan is to inform land use planning, environmental assessments, land and water use authorisations, as well as natural resource management, undertaken by a range of sectors whose policies and decisions impact on biodiversity. This is done by providing a map of biodiversity priority areas, referred to as Critical Biodiversity Areas (CBAs) and Ecological Support Areas (ESAs), with accompanying land use planning and decision-making guidelines (READ, 2015).  
  
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 (READ, 2015).  
  
Ecological Support Areas (ESAs) are terrestrial and aquatic areas that are not essential for meeting biodiversity representation targets (thresholds), but which play an important role in supporting the ecological functioning of critical biodiversity areas and/or in delivering ecosystem services that support socio-economic development, such as water provision, flood mitigation or carbon sequestration. The degree or extent of restriction on land use and resource use in these areas may be lower than that recommended for CBAs (READ, 2015).
- 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); and
- 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> . 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. 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. If listed as threatened only under Criterion A, include if there are less than 10 locations or < 10 000 mature individuals remaining. Small area (> 0.01% but < 0.1% of the total ecosystem type extent) of natural habitat of EN ecosystem type or large area (> 0.1%) of natural habitat of VU ecosystem type. Presence of Rare species. Globally significant populations of congregatory species (> 1% but < 10% of global population).
<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. Any area of natural habitat of threatened ecosystem type with status of VU. Presence of range-restricted species. > 50% of receptor contains natural habitat with potential to support SCC.
<b>Low</b>	No confirmed or highly likely populations of SCC. No confirmed or highly likely populations of range-restricted species. < 50% of receptor contains natural habitat with limited potential to support SCC.
<b>Very Low</b>	No confirmed and highly unlikely populations of SCC. No confirmed and highly unlikely populations of range-restricted species. 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. High habitat connectivity serving as functional ecological corridors, limited road network between intact habitat patches. No or minimal current negative ecological impacts, with no signs of major past disturbance.
<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. Good habitat connectivity, with potentially functional ecological corridors and a regularly used road network between intact habitat patches. 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. Only narrow corridors of good habitat connectivity or larger areas of poor habitat connectivity and a busy used road network between intact habitat patches. Mostly minor current negative ecological impacts, with some major impacts and a few signs of minor past disturbance. Moderate rehabilitation potential.
<b>Low</b>	Small (> 1 ha but < 5 ha) area. Almost no habitat connectivity but migrations still possible across some modified or degraded natural habitat and a very busy used road network surrounds the area. Low rehabilitation potential. Several minor and major current negative ecological impacts.
<b>Very Low</b>	Very small (< 1 ha) area. No habitat connectivity except for flying species or flora with wind-dispersed seeds. 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, Sarah Newman, 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.



Sarah Newman

Terrestrial Ecologist

The Biodiversity Company

October 2025

I, Matthew Mamera , 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.



Matthew Mamera

Soil Scientist

The Biodiversity Company

October 2025

I, Divan van Rooyen, 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.



Divan van Rooyen

Freshwater Ecologist

The Biodiversity Company

October 2025



I, Lize Timmerman, 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.



Lize Timmerman

Terrestrial Ecologist

The Biodiversity Company

October 2025

I, Andine de Villiers, 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.



Andine de Villiers


Terrestrial Ecologist

The Biodiversity Company

October 2025

I, Day B. Mohlala, 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.



Day B. Mohlala

Soil Scientist

The Biodiversity Company

October 2025

I, Andrew Husted, 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.



Andrew Husted

Terrestrial and Freshwater Ecologist

The Biodiversity Company

October 2025

## 7.4 Appendix D – Specialist CVs

### Sarah Newman

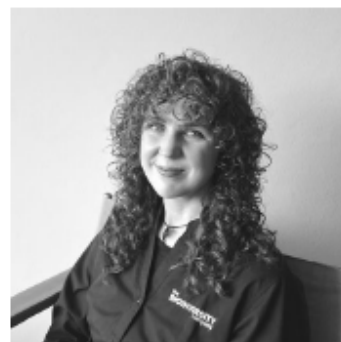
#### M.Sc. Entomology

Cell: +27 73 391 6933

Email: sarah@thebiodiversitycompany.com

Identity Number: 9312170034086

Date of birth: 17 December 1993



Profile Summary	Key Experience	Nationality
Work experience throughout South Africa, as well as Lesotho, Angola, Mauritius and Costa Rica.	<ul style="list-style-type: none"> <li>• Terrestrial Ecological Assessments</li> <li>• Rehabilitation plans and monitoring</li> <li>• Field work and research</li> <li>• Taxonomic classification of insects</li> </ul>	South African
Extensive experience working in the Sani Pass region of southern Africa investigating the patterns and drivers of ant diversity across an elevation gradient.		<b>Languages</b> English – Proficient Afrikaans – Conversational Spanish – Conversational
Experience with sea turtle monitoring and conservation in Costa Rica.	<b>Country Experience</b> South Africa Lesotho Angola Mauritius Costa Rica	<b>Qualifications</b> <ul style="list-style-type: none"> <li>• MSc Entomology (<i>Distinction</i>), University of Pretoria</li> <li>• BSc (Hons) Zoology, University of Pretoria</li> <li>• BSc Zoology, University of Pretoria</li> <li>• Cand Nat Sci (158474)</li> </ul>
Experience conducting terrestrial biodiversity specialist assessments throughout South Africa.		
<b>Areas of Interest</b> Entomology, Zoology, Biodiversity, Conservation and Community Ecology.		

Signed:

Sarah Newman

CURRICULUM VITAE: Sarah Newman



## Matthew Mamera

### PhD Soil Science (*Pri Nat Sci*)

Cell: +27 785 772 668

Email: [matthew@thebiodiversitycompany.com](mailto:matthew@thebiodiversitycompany.com)

Identity Number: 8810315983183

Date of birth: 31 October 1988



#### Profile Summary

Working experience throughout South Africa

Specialist experience with pedology and agriculture.

Specialist expertise include hydropedology, pedology, land contamination, agricultural potential, land rehabilitation, rehabilitation management and wetlands resources.

Experience hydropedological modelling

#### Areas of Interest

Mining, Farming, Soil and Water quality contamination, Soil Sanitation management, Soil Carbon, Sustainability and Conservation.

#### Key Experience

- Environmental Impact Assessments (EIA)
- Environmental Management Programmes (EMP)
- Wetland delineations
- Rehabilitation Plans
- Soil taxonomic classification (SA forms and WRB groups)
- Soil Hydropedology assessments
- Agriculture potential assessments
- Land contamination assessments

#### Country Experience

South Africa: All Provinces  
Zambia - Kitwe and Mufulira  
Angola- Zenza – Cacuso;  
Luena – Saurimo  
Namibia  
Botswana

#### Nationality

South African Permanent Residence

#### Languages

English – Proficient

Ndebele, Xhosa, Shona – Proficient

#### Qualifications

- PhD (University of the Free States)- Soil Science (Hydropedology, Sanitation and Water quality management)
- MSc (University of Fort Hare) – Soil Science (Hydropedology, Sanitation and Water quality management)
- BSc Honours *Cum laude* (University of Fort Hare) – Soil Science (Hydropedology, wetlands delineation and rehabilitation)
- BSc Agricultural Soil Science
- Pri Nat Sci 116356
- SSSSA- SSSSA 201

# Divan van Rooyen

Ph.D. Environmental Science

Pri Sci Nat (151272)

Cell: +27 83 265 8776

Email: [divan@thebiodiversitycompany.com](mailto:divan@thebiodiversitycompany.com)

Identity Number: 9312205072085

Date of birth: 20 December 1993



## Profile Summary

Working experience throughout Southern Africa

Specialist experience with mining, WWTW's and construction.

Specialist expertise include wetlands resources, aquatic ecology and ecotoxicology.

## Areas of Interest

Mining, Seismic Surveys, Renewable Energy, Bulk Services Infrastructure Development & WWTW's.

## Key Experience

- Environmental Impact Assessments (EIA)
- Environmental Management Programmes (EMP)
- Wetland delineations and ecological assessments
- Rehabilitation Plans and Monitoring
- Aquatic biomonitoring

## Country Experience

South Africa

## Nationality

South African

## Languages

English – Proficient

Afrikaans – Proficient

## Qualifications

- PhD (North-West University of Potchefstroom) – Environmental Science with Aquatic Ecosystem Health
- MSc (North-West University of Potchefstroom) – Environmental Science (Ecological Remediation and Sustainable Management)
- BSc Honours (North-West University of Potchefstroom) – Environmental Science with Ecological Remediation and Sustainable Management
- BSc Environmental sciences
- Pri Sci Nat (151272)

# Lize Timmerman

## Terrestrial Ecologist

### Candidate Natural Scientist 158700

Cell: +27 72 529 7454

Email: lize@thebiodiversitycompany.com

Identity Number: 9509220025085

Date of birth: 22 September 1995



#### Profile Summary

Environmental work experience across South Africa (7 years).

Theoretical and practical understanding of methodology in both Botany and terrestrial.

General training and experience in aspects of conservation, terrestrial ecology and floral relocation and monitoring.

#### Areas of Interest

Ecological systems approach, community and wildlife ecology, search and rescue and relocation of protected plants, traditional medicinal plant science, conservation and propagation of plants.

#### Key Experience

- Terrestrial Ecological Assessments
- Environmental Field work and field methodology
- Rehabilitation of Plants and Monitoring
- Biodiversity Assessments
- Habitat delineation
- Ecological Monitoring
- Field work and research

#### Country Experience

South Africa

#### Nationality

South African

#### Languages

English – Proficient

Afrikaans – Proficient

#### Qualifications

- BSc. Agriculture (NQF 8)
- Game Ranch Management Certificate
- Currently enrolled for MSc. in Wildlife Ecology, Health, and Management at University of Pretoria
- Cand Sci Nat (158700)

## Andine de Villiers

M.Sc. Zoology

Candidate Natural Scientist 164894

Cell: +27 64 417 6320

Email: [andine@thebiodiversitycompany.com](mailto:andine@thebiodiversitycompany.com)

Identity Number: 9504080028089

Date of birth: 8 April 1995



### Profile Summary

Work experience in South Africa and Mauritius.

Biodiversity specialist experience in projects related to infrastructure development, renewable energy, mining, and prospecting.

Specific expertise includes terrestrial ecology, including mammals, herpetofauna, avifauna and flora, as well as report writing for environmental compliance, monitoring, management, and rehabilitation.

### Areas of Interest

Zoology, Biodiversity, Conservation, Rehabilitation and Marine Biology.

### Key Experience

- Terrestrial Ecological Assessments
- Rehabilitation plans and monitoring
- Habitat delineation
- Field work and research
- Environmental Management Programs (EMPr)
- Invasive Species Plans

### Country Experience

South Africa  
Mauritius  
Zambia

### Nationality

South African

### Languages

English – Proficient  
Afrikaans – Proficient

### Qualifications

- MSc Zoology (*Cum Laude*), University of Pretoria
- BSc (Hons) Zoology, University of Pretoria
- BSc Zoology, University of Pretoria
- Cand Sci Nat (164894)
- Africa Land-Use Training, Grass Identification (2024)

## Day Boitumelo Mohlala

### MSc Agric. Engineering (Soil & Water Management)

Cell: +27 665 152 210

Email: [day@thebiodiversitycompany.com](mailto:day@thebiodiversitycompany.com)

Identity Number: 9607010625088

Date of birth: 01 July 1996



#### Profile Summary

Working experience throughout South Africa and Serbia.

Specialist experience with soil science, agronomy, water management.

Specialist expertise includes pedology, agronomy, land reclamation, data analysis, irrigation water management.

#### Areas of Interest

Mining, Farming, Soil and Water quality assessment, Soil Sanitation management, Sustainability agriculture.

#### Key Experience

- Soil taxonomic classification (SA forms and WRB groups)
- Agronomy
- Water use and crop management
- Soil mapping (GIS and remote sensing).
- Land reclamation

#### Country Experience

South Africa: All Provinces  
Serbia: Belgrade – Novi Sad

#### Nationality

South African Permanent Residence

#### Languages

English – Proficient  
Zulu, Sepedi, Setswana – Proficient

#### Qualifications

- MSc (University of Belgrade) – Agricultural Engineering (Soil & Water Management) - Pedology, GIS & Remote Sensing, Soil classification and Water management
- BSc Hons (University of Limpopo) Agriculture Soil Science – (Soil classification, Pedology and Soil survey)



## Andrew Husted

M.Sc Aquatic Health (Pr Sci Nat)

Cell: +27 81 319 1225

Email: [andrew@thebiodiversitycompany.com](mailto:andrew@thebiodiversitycompany.com)

Identity Number: 7904195054081

Date of birth: 19 April 1979



### Profile Summary

Working experience throughout South Africa, West and Central Africa and also Armenia & Serbia.

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

Experience with project management for national and international multi-disciplinary projects.

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

Specialist expertise include Instream Flow and Ecological Water Requirements, Freshwater Ecology, Terrestrial Ecology and also Ecosystem Services.

### Areas of Interest

Sustainability and Conservation.

Instream Flow and Ecological Water Requirements.

Publication of scientific journals and articles.

### Key Experience

- World Bank, Equator Principles and the International Finance Corporation requirements
- Environmental, Social and Health Impact Assessments (ESHIA)
- Environmental Management Programmes (EMP)
- Ecological Water Requirement determination experience
- Wetland delineations and ecological assessments
- Rehabilitation Plans and Monitoring
- Fish population structure assessments
- The use of macroinvertebrates to determine water quality.
- Aquatic Ecological Assessments
- Aquaculture

### Country Experience

Angola, Botswana, Cameroon  
Democratic Republic of Congo  
Ghana, Ivory Coast, Lesotho  
Liberia, Mali, Mauritius, Mozambique  
Nigeria, Republic of Armenia,  
Senegal, Serbia, Sierra Leone, South Africa  
Tanzania

### Nationality

South African

### Languages

English – Proficient

Afrikaans – Conversational

German - Basic

### Qualifications

- MSc (University of Johannesburg) – Aquatic Health.
- BSc Honours (Rand Afrikaans University) – Aquatic Health
- BSc Natural Science
- Pr Sci Nat (400213/11)
- Certificate of Competence: Mondi Wetland Assessments
- Certificate of Competence: Wetland WET-Management
- SASS 5 (Expired) – Department of Water Affairs and Forestry for the River Health Programme
- EcoStatus application for rivers and streams

Signed:

Andrew Husted

CURRICULUM VITAE: Andrew Husted