

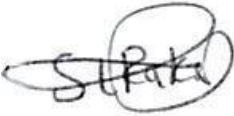






Integrated Environmental Authorisation Applications for Modikwa Platinum Mine South 3 Opencast Project

**Draft Ecological Study for Modikwa Platinum Mine South 3
Project**

May 2024

Document Control

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Glossary of Terms

Term	Definition
Alien Invasive Species	An exotic species that can spread rapidly and displace native species causing damage to the environment.
Biodiversity	Term used to describe the variety of life on Earth and is defined as “the variability among living organisms from all sources including terrestrial, marine and other aquatic ecosystems, and the ecological complexes of which they are part; this includes diversity within species, between species, and of ecosystems” (Secretariat of the Convention on Biological Diversity, 2005).
Habitat Fragmentation	Occurs when large expanses of habitat are transformed into smaller patches of discontinuous habitat units isolated from each other by transformed habitats such as farmland.
Key Biodiversity area	A globally recognized site that contains significant concentrations of biodiversity.
Natural Habitat	Refers to habitats composed of viable assemblages of plant and/or animal species of largely native origin and/or where human activity has not essentially modified an area’s primary ecological function and species composition.
Pentad	A 5-minute x 5-minute coordinate grid super-imposed over the continent for spatial reference.
Protected Area	A clearly defined geographical space, recognized, dedicated and managed, through legal or other effective means, to achieve the long-term conservation of nature with associated ecosystem services and cultural values. (IUCN Definition 2008).




List of Acronyms

Acronym	Term
AOO	Area of Occupancy
CBA	Critical Biodiversity Area
CES	Coastal and Environmental Services
CR	Critically Endangered
ECO	Environmental Control Officer
EDGE	Evolutionarily Distinct and Globally Endangered
EN	Endangered
ESIA	Environmental and Social Impact Assessment
EOO	Extent of Occupancy
GBIF	Global Biodiversity Information Facility
GIS	Geographical Information System
IBA	Important Birding Areas
IUCN	International Union for Conservation of Nature
KBA	Key Birding Areas
LC	Least Concern
NBSAP	National Biodiversity and Strategy Action Plan
NEMBA	National Environmental Management Biodiversity Act
NGO	Non-Government Organization
PNCO	Provincial Nature Conservation Ordinance
SCC	Species of Conservation Concern
QDS	Quarter Degree Square
RSA	South Africa
SANBI	South African National Biodiversity Institute
TOPS	Threatened and Protected Species



Table of Contents

1	Introduction.....	8
1.1	Project location and description	8
1.2	Purpose of this report.....	8
1.3	Aims, Objectives and terms of reference.....	11
1.4	Legislative framework.....	12
1.5	Scope of assessment of the specialist report	16
2	Assessment Methodology.....	17
2.1	Data collection and assessment approach.....	17
2.1.1	Desktop assessment	17
2.1.2	Site assessment	18
2.2	Vegetation mapping	19
2.3	Sensitivity mapping.....	19
2.4	Impact assessment.....	20
2.5	Assumptions, limitations and Gaps in knowledge	24
3	Description of the biophysical environment	24
3.1	Desktop assessment	24
3.1.1	Climate	26
3.1.2	Topology.....	26
3.1.3	Geology and Soils	26
3.1.4	Drainage, river and wetland ecosystem context.....	27
3.1.5	Description of vegetation and flora.....	28
3.1.6	Description of fauna.....	29
3.2	Site Assessment	30
3.2.1	Vegetation types and land uses on site	30
3.2.2	Plant species identified on site	30
4	Impact Assessment.....	38
5	Impact statement, conclusion and recommendation	42
5.1	Recommendations for the proposed activity and EA and EMPr	42
5.2	Fatal Flaws.....	45
5.3	Environmental statement and opinion of the specialist	45
6	References	46
7	Appendices.....	47



7.1	Mammals.....	47
7.2	Amphibians.....	47
7.3	Birds.....	48
7.4	Reptiles.....	48



List of Tables

Table 1: Relevant Legislative Framework	12
Table 2: Requirements of Terrestrial Biodiversity Specialist Assessment Report (CES, 2021).....	17
Table 3: Site Sensitivity criteria.....	19
Table 4: Impact assessment methodology.....	20
Table 5: Plant species found on site	30
Table 6: Impact assessment on the loss of protected tree species.....	39
Table 7: Impact assessment on the further establishment and spread of alien plant species.....	40
Table 8: Impact assessment on the further fragmentation of indigenous vegetation/faunal habitat due to vegetation clearance	40
Table 9: Impact assessment on further soil erosion	41
Table 10: Impact assessment of further disruption to ecological function and processes.....	42
Table 11: Recommendations and mitigations	43
Table 12: List of mammals found within the area that includes the proposed sit.....	47
Table 13: list of amphibians found within the area that includes the proposed site	47
Table 14: List of birds found within the area that includes the study site.....	48
Table 15: List of reptiles found within the areas that includes the study area	48

List of Figures

Figure 1: Map of relative terrestrial biodiversity theme.....	9
Figure 2: Map of relative plant species theme	10
Figure 3: Map of relative animal species theme	11
Figure 4: Map of the vegetation type of the proposed site	25
Figure 5: Map of the Geology of the proposed site	27
Figure 6: Map of the Quaternary Catchment of the proposed site	28
Figure 7: Plant species found on site.....	37



1 Introduction

Segope Water and Environmental Services was appointed by Modikwa Platinum Mine to undertake an Ecological Impact Assessment on for the proposed opencast mine on Winterveld farm 293 KT in the Fetakgomo Tubatse Local municipality in the Limpopo Province.

1.1 Project location and description

Anglo American Platinum Rustenburg Platinum Mines Limited (RPM) and African Rainbow Minerals Mining Consortium Limited (ARM MC), as part of a Joint Venture, are applying to amend their existing approved Modikwa Platinum Mine (MPM) South 2 Shaft Environmental Management Program (EMP) which was approved in 2014 (DMR Reference: LP 30/5/1/2/3/2(129) to include the proposed additional South 3 Opencast Project and mining related infrastructures and activities associated with their South 3 Opencast Operation.

MPM is located approximately 20 km west of Burgersfort and 18 km north of Steelpoort on the Eastern Limb of the Bushveld Complex, within Fetakgomo Tubatse Local Municipality (FTLM) in the Sekhukhune District Municipality of the Limpopo Province. MPM's mining area includes portions of the farms: Maandagshoek 254 KT, Driekop 253 KT, Hendrikplaats 281 KT, Onverwacht 292 KT and Winterveld 293 KT.

The South 3 Opencast Project is situated on the Winterveld 293 KT Farm, which is owned by the Samancor Chrome Mine, and for which MPM has a lease agreement. Access to South 3 Project area is through a gravel road which joins a tarred road leading to R555 in Steelpoort town which then joins the regional road (R37) from Burgersfort.

1.2 Purpose of this report

According to the Protocol for the Specialist Assessment and Minimum Reporting Content Requirements for Environmental Impacts on Terrestrial Biodiversity (GN R. 320 of 2020), prior to the commencement of a specialist assessment, the current use of the land and the potential environmental sensitivity of the site under consideration as identified by the screening tool, must be confirmed by undertaking a site sensitivity verification. The results of the screening tool, together with the site sensitivity verification, ultimately determines the minimum report content requirements.

The results of the Screening Report generated for the proposed South 3 Opencast Mine project, show that the relative terrestrial biodiversity theme sensitivity is classified as VERY HIGH due to proposed site falling within a Critical Biodiversity Area (CBA)₁, CBA₂, Ecological Support Area (ESA)₁, and ESA₂. (Figure 3.7). According to Section 3 (1) of GN R. 320, 'an applicant intending to undertake an activity identified in the scope of this 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’.

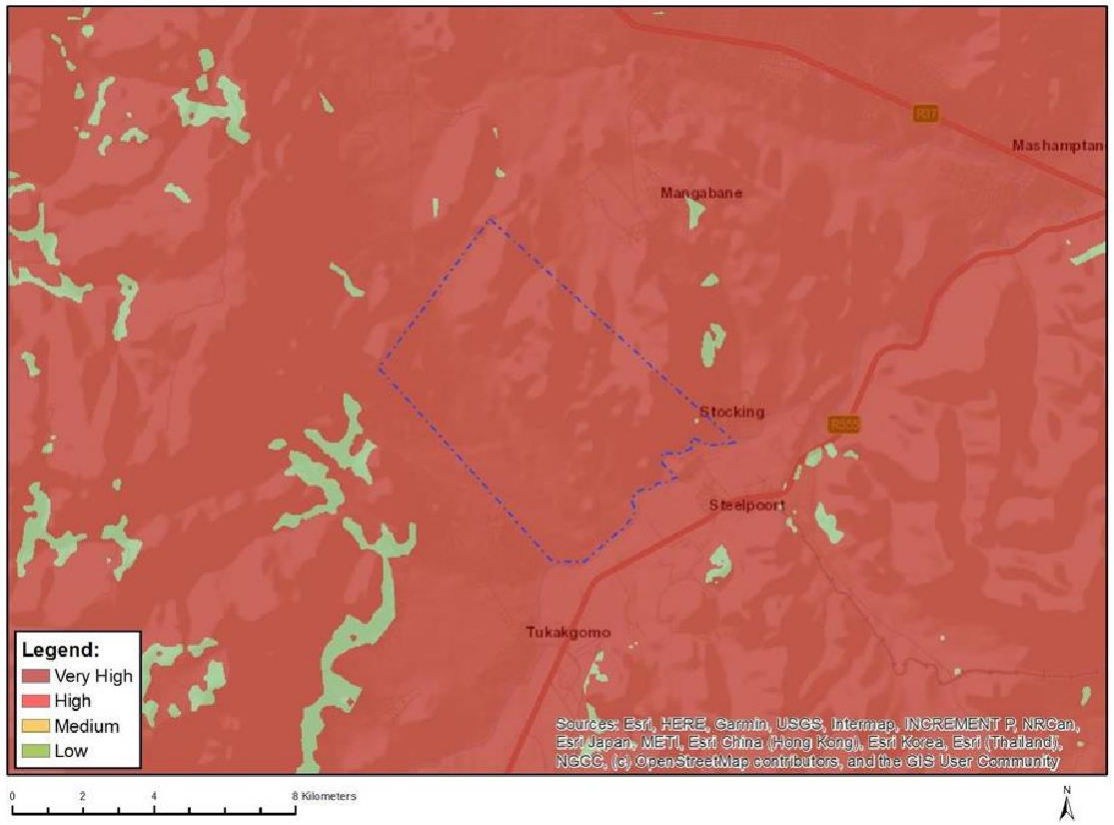


Figure 1: Map of relative terrestrial biodiversity theme

Due to the very high sensitivity rating of the site, a full Terrestrial Biodiversity Specialist Assessment (this report) has been undertaken as part of the integrated Scoping and EIA Process for the proposed South 3 Opencast Mine project.

The Screening Report also indicates that the site falls within medium and low sensitivity areas in terms of terrestrial animal and plant species sensitivity, respectively. The sensitive animal species identified are *Aves-Falco biarmicus* (LC), which has a high sensitivity. *Aves-senegalensis* (VU), *Sagittarius-serpentarius* (VU), *Aves-Hydroprogne caspia* (VU), *Aves-Aquila rapax* (EN), *Aves-Aquila verreauxii* (LC), *Mammalia-crocidura maquassiensis* (VU), *Mammalia-Dasymys robertsii* (VU), *Mammalia-Lycaon pictus* (VU), *Reptilia crocodylus niloticus* (VU), *Kinixys lobatsiana* (VU) and *Invertebrate Aroegasi-fuscus* (EN) which have a medium sensitivity as recorded by the screening tool.

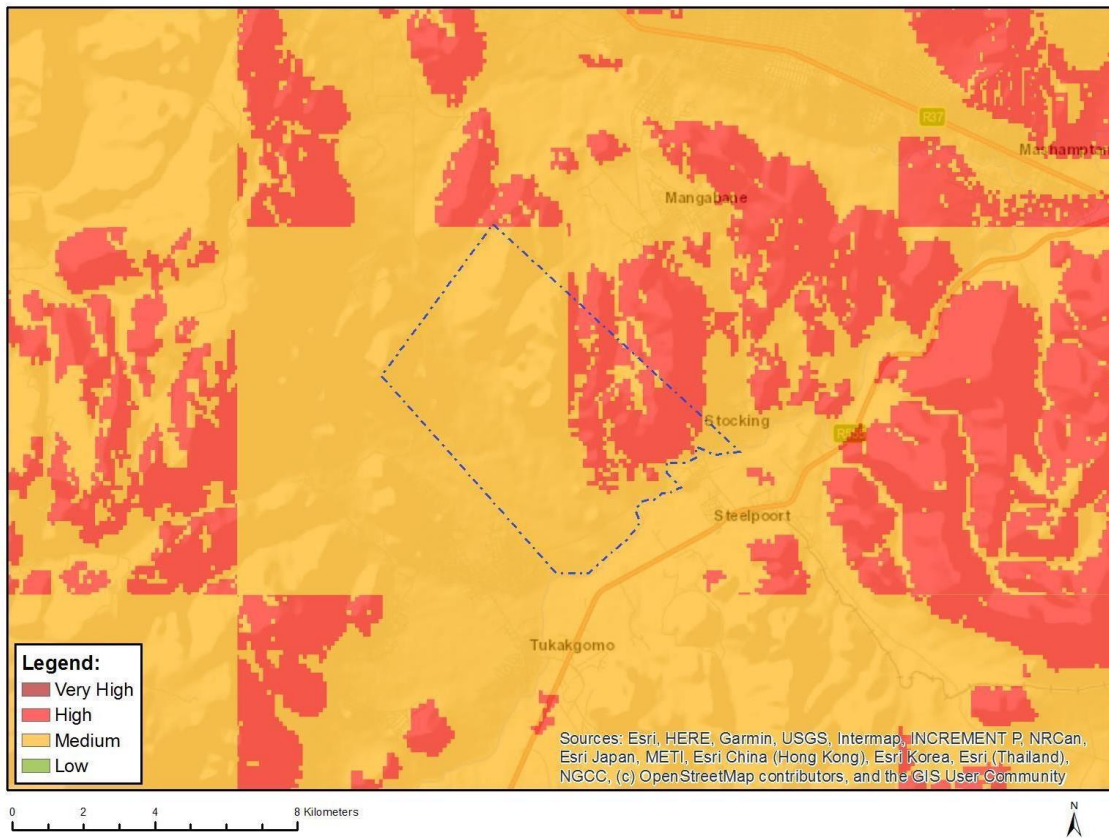


Figure 2: Map of relative plant species theme

The sensitive plant species identified by the screen are as follows: medium sensitivity- species 1252, species 1033, species 587, species 92, *Asparagus-fourei* (VU), *Plectranthus-venteri* (VU), *Polygala-sekhukhuniensis* (VU) *Searsia-sekhukhuniensis* (RARE), *Searsia-batophylla* (VU) and *Combretum-petrophilum* (RARE) are the sensitive plant species recorded by the screening tool. According to the Species Environmental Assessment Guideline (SANBI, 2020):

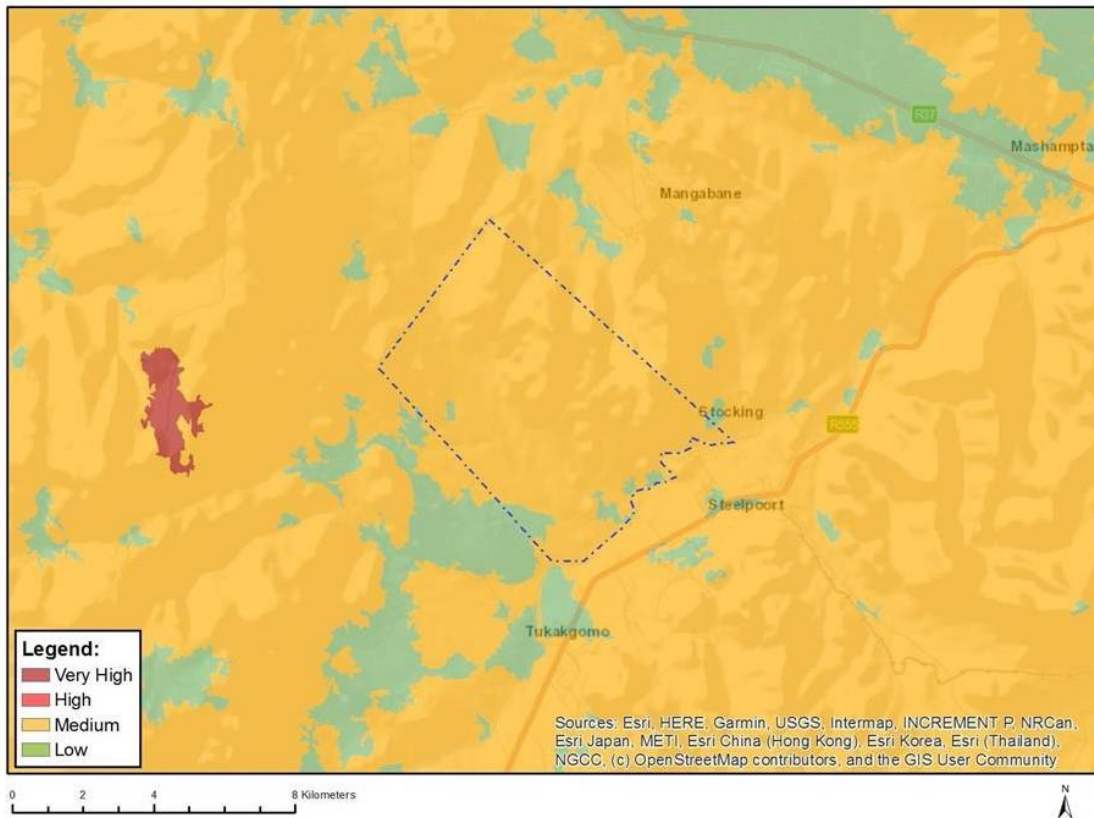


Figure 3: Map of relative animal species theme

1.3 Aims, Objectives and terms of reference

The specialist assessment sought to assess the ecological state and current land-use of the proposed site, identify potential sensitive ecosystems and plant species, and identify potential impacts of the proposed development. The objectives for the ecological assessment are as follows:

- Describe and map the vegetation types in the study area.
- Describe the biodiversity and ecological state of each vegetation unit.
- Establish and map sensitive vegetation areas showing the suitability for development and no-go areas.
- Identify plant and animal species of conservation concern (Red Data List and TOPS lists). In this case of the fauna study was done at a desktop level.
- Identify alien plant species, assess the invasive potential and recommend management procedures.
- Identify and assess the impacts of development on the site’s natural vegetation and faunal species in terms of habitat loss, fragmentation and degradation of key ecosystems and, where feasible, provide mitigation measures to reduce these impacts

1.4 Legislative framework

This specialist assessment was conducted in alignment with the regulatory and legislative requirements for environmental management in South Africa. The environmental legislation relevant to the proposed development is summarised below.

Table 1: Relevant Legislative Framework

Legislation	Description	Relevance
The Constitution, 1996 (Act No. 108 of 1996).	The Constitution of the Republic of South Africa is the supreme law of the land. As a result, all laws, including those pertaining to this Management Plan, must conform to the Constitution. The Bill of Rights - Chapter 2 of the Constitution, includes an environmental right (Section 24) according to which, everyone has the right: a) To an environment that is not harmful to their health or well-being; and b) To have the environment protected for the benefit of present and future generations, through reasonable legislative and other measures that: I. Prevent pollution and ecological degradation; ii. Promote conservation; and iii. Secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.	The proponent has an obligation to ensure that the proposed activity will not result in pollution and ecological degradation, as well as an obligation to ensure that the proposed development is ecologically sustainable, while demonstrating economic and social development
National Environmental Management Act (NEMA), 1998 (Act No. 108 of 1998)	The objective of NEMA is: "To provide for cooperative environmental governance by establishing principles for decision-making on matters affecting the environment, institutions that will promote cooperative governance and procedures for coordinating environmental functions exercised by organs of state; and to provide for matters connected therewith." This report has been guided by the NEMA Principles detailed in Section 2 of the Act. NEMA introduces the "duty of care" concept, which is based on the policy of strict liability. This duty of care extends to the prevention, control and rehabilitation of significant pollution and environmental degradation. It also dictates a duty of care to address emergency	The undertaking of a specialist study, in this case, the terrestrial biodiversity study, in order to identify potential impacts on the terrestrial environment and to recommend mitigation measures to minimize these impacts, complies with Section 28 of NEMA. The developer must apply the NEMA principles, the fair decision-making and conflict management procedures that are provided for in NEMA.

Legislation	Description	Relevance
	incidents of pollution. A failure to perform this duty of care may lead to criminal prosecution, and may lead to the prosecution of responsible persons, including companies, for the conduct of the legal persons.	
NEMA EIA Regulations (2014, as amended)	The NEMA EIA Regulations (2014, as amended) aim to avoid detrimental environmental impacts through the regulation of specific activities that cannot commence without prior environmental Authorisation. Authorisation either requires a Basic Assessment or a Full Scoping and Environmental Impact Assessment, depending on the type of activity. These assessments specify mitigation and management guidelines to minimize negative environmental impacts and optimize positive impacts. Should any portion of an area be proposed for development (after proclamation) these Regulations should be consulted	An application for Environmental Authorisation (as triggered by the EIA 2014 Regulations, as amended) is required to be submitted to the Competent Authority.
Environmental Impact Assessment Regulations 2014(as amended).	Public consultation is a legal requirement throughout the EIA process. Developers are required to conduct public consultation throughout the Basic Assessment process. Formal EIA documents are required to be made available for public review, which include the project brief, Draft and Final BARs, and the decision of the Competent Authority. According to Regulation 41(2) of the NEMA EIA Regulations 2014 (as amended 2017) “The person conducting a public participation process must take into account any relevant guidelines applicable to public participation as contemplated in section 24J of the Act”	The Public Participation Process (PPP) to be followed will be described in detail in the Basic Assessment Report. The draft ecological report (this report), will be attached to the Draft BAR and will undergo a formal 30-day public commenting and review period. All proof and correspondence will be available in the Draft and Final BARs. No comments have been received to date that relates to the terrestrial ecological environment
National Environmental Management: Biodiversity Act (NEMBA), 2004 (Act No. 10 of 2004)	The National Environmental Management: Biodiversity Act (NEMBA), No. 10 of 2004, aims to assist with the management and conservation of South Africa’s biological diversity through the use of legislated planning tools. These planning tools include the declaration of bioregions and	Activities may not be carried out in threatened or protected ecosystems without first gaining Authorisation for such activities. No protected species may be removed or damaged without a permit.

Legislation	Description	Relevance
	<p>the associated bioregional plans as well as other mechanisms for managing and conserving biodiversity. The objectives of the Act include inter alia:</p> <ul style="list-style-type: none"> • The management and conservation of biological diversity within the Republic and of the components of such biological diversity; • The use of indigenous biological resources in a suitable manner; • The fair and equitable sharing of benefits arising from bio-prospecting of genetic material derived from indigenous biological resources; and • To give effect to ratified international agreements relating to biodiversity which are binding on the Republic. • To provide for co-operative governance in biodiversity management and conservation; and • To provide for a South African National Biodiversity Institute to assist in achieving the objectives of the Act. • In addition to this, Sections 50-62 of the Act provide details relating to the protection of threatened or protected ecosystems and species, while Sections 63-77 of the Act provide details relating to alien and invasive species with the purpose of preventing their introduction and spread, managing, controlling and eradicating of alien and invasive species 	
<p>NEMBA National List of Threatened Ecosystems (GNR 1002 of 2011)</p>	<p>The National List of Ecosystems is in place for the ecosystems that are threatened and in need of protection. The NEMBA provides for listing of threatened or protected ecosystems in one of the following categories:</p> <ul style="list-style-type: none"> • Critically endangered (CR) ecosystems, being ecosystems that have undergone severe degradation of ecological structure, function or composition as a result of human intervention and are subject to an extremely high risk of irreversible transformation; 	<p>An invasive species management, control and eradication plan for land/activities under their control should be developed, as part of their environmental plans in accordance with Section 11 of NEMA.</p>

Legislation	Description	Relevance
	<ul style="list-style-type: none"> • Endangered (EN) ecosystems, being ecosystems that have undergone degradation of ecological structure, function or composition as a result of human intervention, although they are not critically endangered ecosystems; • Vulnerable (VU) ecosystems, being ecosystems that have a high risk of undergoing significant degradation of ecological structure, function or composition as a result of human intervention, although they are not critically endangered ecosystems or endangered ecosystems; • Protected ecosystems, being ecosystems that are of high conservation value or of high national or provincial importance, although they are not listed as critically endangered, endangered or vulnerable. 	
NEMBA: Alien Invasive Species Regulations (2014)	<p>The Alien and Invasive Species Regulations (2014) categorizes the different types of alien and invasive plant and animal species and how they should be managed:</p> <ul style="list-style-type: none"> • Category 1a Listed Invasive Species – species which must be combatted or eradicated. • Category 1b Listed Invasive Species – species which must be controlled. • Category 2 Listed Invasive Species – species which require a permit and must not be allowed to spread outside of the designated area. • Category 3 Listed Invasive Species – species which are subject to exemptions in terms of section requiring a permit, but where such a species occurs in riparian areas, must, for the purposes of these regulations, be considered to be a Category 1b Listed Invasive Species and must be managed according to regulation 3 	An invasive species management, control and eradication plan for land/activities under their control should be developed, as part of their environmental plans in accordance with Section 11 of NEMA.

Legislation	Description	Relevance
Terrestrial Biodiversity Protocol (2020)	This protocol provides the criteria for the specialist assessment and minimum report content requirements for impacts on aquatic biodiversity for activities requiring EA. This protocol replaces the requirements of Appendix 6 of the EIA Regulations 2014, GN R. 982 (as amended), published under NEMA.	The screening tool identified the site footprint as falling within an area of “Very High Sensitivity” for Terrestrial Biodiversity, due to the presence of a Terrestrial Ecological Support Area (ESA) 1 within the site. This triggered the need for a full Terrestrial Biodiversity Assessment. This assessment and report comply with Terrestrial Biodiversity Protocol
Plant and Animal Species Protocols (GN R. 1150 2020), and the associated Species Environmental Assessment Guideline (SANBI, 2020)	These protocols provide the criteria for the specialist assessment and minimum report content requirements for impacts on plant and animal species diversity for activities requiring EA. This protocol replaces the requirements of Appendix 6 of the EIA Regulations 2014, GN R. 982 (as amended), published under NEMA.	The screening tool indicates that the site falls within low and medium sensitivity areas in terms of terrestrial plant and animal species sensitivity, respectively. This assessment and report comply the Plant and Animal Species Protocols, as well as the Species Environmental Assessment Guideline.

1.5 Scope of assessment of the specialist report

The scope and aim of this report was to:

- Give a general description of the ecology of the proposed site.
- Description and mapping of the broad vegetation units (if more than one) a plant species list.
- Record the presences and diversity of plant species that are of conservation significance.
- To comment on the sensitivity of the habitat in the proposed site
- To evaluate the impact that the proposed mine may have to the ecology of the proposed site.
- To provide mitigation measures that can be implemented to minimize the potential impacts of the proposed mine.



2 Assessment Methodology

2.1 Data collection and assessment approach

2.1.1 Desktop assessment

A desktop assessment of the site was conducted in terms of current vegetation classifications and biodiversity programmes and plans. For the terrestrial flora, the consideration of the following has been included:

- The South African Vegetation Map (Mucina and Rutherford, 2018);
- The Limpopo Conservation Plan (2013);
- The Waterberg Bioregional Plan (2016);
- Council for Geoscience (2013) South African Geology;
- Soil and Terrain (SOTER) Database of South Africa (2008);
- Review of the SANBI Red Data List; and
- Available literature on the regional vegetation.


Data on the known distribution and conservation status for each potential plant SCC were obtained in order to develop a list of SCC. These plant species are those that are subject to significant impacts from the proposed activity. In general, these will be species that are already known to be threatened or at risk. Efforts to provide the conservation status (SA 'red list' status) of individual species may provide additional valuable information on SCC (see <http://redlist.sanbi.org>). SCC have been identified by means of a combination of applicable legislation, guidelines and conservation status lists.

The following lists were utilised to cross reference conservation and protection statuses of various species:

- National Environmental Management: Biodiversity Act (No. 10 of 2004) – Chapter 4, Part 2;
- Limpopo Environmental Management Act (LEMA, No. 7 of 2003) Schedule 11 – List of Specially Protected Plants and Schedule 12 – List of Protected Plants;
- 1976 List of Protected Trees (Government Gazette No. 9542 Schedule A) in the 1998 National Forest Act (NFA) as amended in November 2014; and
- SA Red Data List.

The South African Red Data List of plants use the internationally recognised IUCN Red List Categories and Criteria to measure a species risk of extinction. Since the Red List of South African plants are used widely for conservation practices throughout South Africa, this list has been modified to identify species that are at low risk of extinction but of high conservation importance. Species that are afforded special protection, which are protected by the Threatened or Protected Species (TOPS) list and by Schedule 11 and 12 of LEMA are also regarded as SCC.

A detailed faunal survey was not conducted. Although a site visit was undertaken, the faunal survey



was mainly a desktop study, using information from previous ecological surveys conducted in the area. This data was supplemented by recording animal species that were observed during the site survey.

Faunal distribution data were primarily sourced from the following web-based databases:

- The International Union for Conservation of Nature (IUCN) Red List of Threatened Species Website;
- The Animal Demography Unit (ADU) Virtual Museum's Frog, Reptile and Mammal Maps;
- The iNaturalist Website; and • The Global Biodiversity Information Facility (GBIF) website.

2.1.2 Site assessment

The field survey was conducted on the 13th and 14th of March 2024, which is considered early autumn, the end of the flowering season for most plants, which results in the identification of some species to family level only.

The survey was conducted in one portion of the proposed site and use a representative of the site as a whole. As the proposed site sits in one vegetation type. As the area is too vast to have been surveyed in its entirety. The survey was plotless and consisted of a walkthrough, capture of pictures, noting of any faunal presence.


It should be noted that a full faunal study was not completed and reliance on a desktop study and past studies within the area were taken into consideration.

2.2 Vegetation mapping

The revised SA VEGMAP (2018) maps “floristically-based vegetation units of South Africa, Lesotho and Swaziland at a greater level of detail than had been available before.” The map was developed using a wealth of data provided by a network of ecologists, biologists and conservation planners that make periodic contributions to the project. These contributions have allowed for the best national vegetation map to date, the last being that of Acocks developed over 50 years ago. The SA VEGMAP informs finer scale bioregional plans and includes an additional 47 new vegetation units since its refinement in 2012. The SA VEGMAP is compared to actual conditions of vegetation observed onsite during the site assessment through mapping from satellite images, literature descriptions and related data gathered on the ground

2.3 Sensitivity mapping

The Species Environmental Assessment guideline (SANBI, 2020) was applied to assess the Site Ecological Importance (SEI) of the project area. The habitats and the species of conservation concern in the project area were assessed based on their conservation importance, functional integrity and receptor resilience as shown in table 2. The combination of these resulted in a rating of SEI and interpretation of mitigation requirements based on the ratings. The sensitivity map was developed



using available spatial planning tools as well as by applying the SEI sensitivity based on the field survey.

Table 3: Site Sensitivity criteria

Criteria	Description
Conservation Importance (CI)	The importance of a site for supporting biodiversity features of conservation that are present.
Functional Integrity (FI)	A measure of the ecological condition of the impact receptor as determined by its remaining intact and functional area, its connectivity to other natural areas and the degree of current persistent ecological impacts.
Biodiversity Importance (BI)	Is a function of the CI and the FI of the receptor

Receptor Resilience (RR)	The intrinsic capacity of the receptor to resist major damage from disturbance and/or to recover to its original state with limited or no human intervention.
Site Ecological Importance. (SEI)	Is a function of BI and RR

2.4 Impact assessment

The impact methodology used for this report was developed in line with the terrestrial biodiversity protocol, together with the impact ratings as required in appendix 1 and 2 of the EIA regulations (2014, as amended).

The following variables were considered when developing the impact methodology:

- **Nature:** This indicates whether the impact will have a positive or negative impact on the environment.
- **Type of impact:** This indicates whether the impact is direct/indirect or cumulative.
- **Significance:** The criteria in Table 3 are used to determine the overall significance of an activity. The impact effect (which includes duration; extent; consequence and probability) and the reversibility/mitigation of the impact are then read off the significance matrix in order to determine the overall significance of the issue. The overall significance is either negative or positive and will be classified as low, moderate or high (Table 3)
- **Extent:** the spatial scale to define the significance of the impact at various time scales as an indication of the duration of the impact.
- **Duration:** the temporal scale defines the significance of the impact at various time scales, as an indication of the duration of the impact.
- **Probability:** the likelihood of the impact taking place as a result of the project actions arising from the various alternatives.
- **Reversibility:** the degree to which the environment can be returned to its original/partially original state.
- **Irreplaceable loss:** the degree of irreplaceable loss which an impact may cause e.g. loss of non-regenerative vegetation or removal of rocky habitat or destruction of wetland.
- **Mitigation potential:** the degree of difficulty of reversing and/or mitigating the various impacts ranges from very difficult to easily achievable. Both the practical feasibility of the measure, the potential cost and the potential effectiveness is taken into consideration when determining the appropriate degree of difficulty.

Table 4: Impact assessment methodology

Criteria	Categories	Description	Rating
Duration	Construction/Decommissioning phase only	The impact endures for only as long as the construction or the	1

Criteria	Categories	Description	Rating
		decommissioning period of the project activity. This implies that the impact is fully reversible	
	Short Term	Between 3 and 5 years	2
	Medium Term	Between 6 and 15 years	3
	Long Term	More than 15 years	4
	Permanent	Over 40 years or resulting in a permanent and lasting change that will always be there.	5
Extent	Localised	Impacts affect a small area of a few hectares in extent. Often only a portion of the project area.	1
	Study Area	The proposed site and its immediate environments	2
	Municipality	Impacts affect the municipality, or any towns within the municipality	3
	Regional	Impacts affect the wider district municipality or the Limpopo Province as a whole.	4
	National	Impacts affect the entire country.	5
Likelihood	Definite	More than 90% sure of a particular fact. Should have substantial supportive data	1
	Probable	Over 70% sure of a particular fact, or of	0.75

Criteria	Categories	Description	Rating
		the likelihood of that impact occurring.	
	Possible	Only over 40% sure of a particular fact, or of the likelihood of an impact occurring.	0.5
	Unsure	Less than 40% sure of a particular fact, or of the likelihood of an impact occurring.	0.25 and less
Impact significance	Low	The risk/impact may result in minor alterations of the environment and can be easily avoided by implementing appropriate mitigation measures and will not have an influence on decision-making. Project can be authorised with low risk of environmental degradation	<3
	Moderate	The risk/impact will result in moderate alteration of the environment and can be reduced or avoided by implementing the appropriate mitigation measures and will only have an influence on the decision-making if not mitigated. Project can be authorized but with conditions and routine inspections. Mitigation measures	3-9

Criteria	Categories	Description	Rating
		must be implemented	
	High	The risk/impact will result in major alteration to the environment even with the implementation on the appropriate mitigation measures and will have an influence on decision-making. Project can be authorized but with strict conditions and high levels of compliance and enforcement. Monitoring and mitigation are essential	10-20
	Fatally Flawed	The risk/impact will result in very major alteration to the environment even with the implementation on the appropriate mitigation measures and will have an influence on decision-making. The project cannot be authorized unless major changes to the engineering design are carried out to reduce the significance rating.	21-26
Irreplaceable loss	Resource will not be lost	The resource will not be lost/destroyed provided mitigation measures are implemented.	
	Resource may be partially lost	The resource will be partially destroyed even though mitigation measures are implemented.	

Criteria	Categories	Description	Rating
	Resource will be lost	The resource will be lost despite the implementation of mitigation measures.	
Reversibility	Reversible	The activity will lead to an impact that can be reversed provided appropriate mitigation measures are implemented.	
	Irreversible	The activity will lead to an impact that is permanent regardless of the implementation of mitigation measures.	
Type	Direct	Direct interaction of an activity with the environment	
	Indirect	Impacts on the environment that are not a direct result of the project or activity	
	Cumulative	Impacts which may result from a combination of impacts of this project and similar related project	
Nature	Negative	Detrimental/negative impact	
	Positive	Beneficial/positive impact	

2.5 Assumptions, limitations and Gaps in knowledge

This report was compiled using the available information, there are some limitations that need to be noted:

- Due to the study taking place in March, which is early autumn, some of the species could only be identified to genus level, while others may not be identified at all.
- There was no scientific data that was collected or analysed for the calculation of the ecological condition. Any comments or observations that have been made in this regard are based on expert knowledge and relevant professional experience.
- Data collection in this study relied on data from representative, homogenous sections of the vegetation units, as well as general observations, analysis of generic and desktop data.
- To get a full understanding of the dynamics of the vegetation that is on the proposed site, it is important that surveys are repeated over several seasons and over a number of years. However, this kind of long-term study was not possible for this study due to the time constraints of the project.

3 Description of the biophysical environment

3.1 Desktop assessment

This section of the report gives a description of the receiving environment. It will also provide the context under which the assessment is has been undertaken.

The proposed site falls into the Sekhukhune Plains Bushveld vegetation type, it is also surrounded by the Sekhukhune Mountain Bushveld (Mucina and Rutherford 2006)

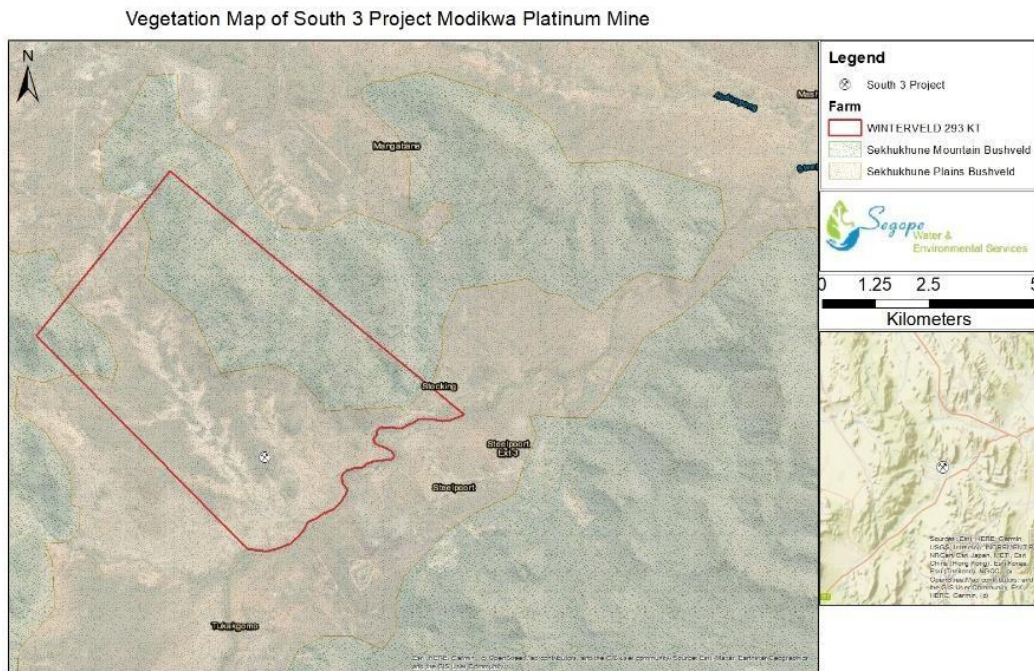



Figure 4: Map of the vegetation type of the proposed site

This vegetation type had previously been classified as Mixed Bushveld (Acocks, 1953, Low and Rebelo, 1996). It occurs widely throughout the Limpopo Province, occurring mostly in lower river basins and plains at an altitude of between 700 - 1100 m.

The area is mainly semi-arid plains with open valleys associated with the small hills and mountains running parallel to the larger escarpment mountains. Predominantly found is closed thornveld with a variety of Aloes and other succulents (Mucina and Rutherford, 2006). Erosion dongas are prominent in the clay rich soils of the area (Mucina and Rutherford, 2006).

The Sekhukhune Mountain Bushveld (SVcb 28) was previously known as the Sourish Mixed Bushveld (Acocks, 1953) or the Mixed Bushveld (Low and Rebelo, 1996). Siebert et al. 2002) called it the *Kirkia wilmsii-Terminalia prunioides* Closed Mountain Bushveld, *Combretum hereroense-Grewia vernicosa* Open Mountain Bushveld, *Hippobromus pauciflorus-Rhoicissus tridentate* Rock Outcrop Vegetation.

This vegetation type is found within the Limpopo and Mpumalanga provinces and is comprised of mountains and undulating landscapes. It is known to be dry with open to closed micro-phyllus and



broad-leaved savanna. On the mountain slopes, the bushveld vegetation is taller in the valleys with a well-developed herb layer. In the dryer habitats, a number of xerophytic adapted species are present (Mucina and Rutherford, 2006).

3.1.1 Climate

The Sekhukhune Plains Bushveld is known for its dry winter and summer rainfall with the average between 400-600 mm per annum. Very little frost occurs and the mean daily temperatures range between 37.3°C and -0.9°C. The Sekhukhune Mountain Bushveld has a MAP of 500-700mm with infrequent frost (Mucina and Rutherford, 2006).

3.1.2 Topology

The topography of the mine project area is extremely rugged, dominated by steep-sided hills and mountains in the east and west with a broad valley in between. The lower lying valley areas between the steep-sided mountains are at an average height of 940 metres above mean sea level (amsl). The highest ridges have elevations of approximately 1 800 m on the east and 1 200 m on the western side

3.1.3 Geology and Soils

The Sekhukhune Plains Bushveld is known for its complex geology consisting of the Rustenburg Layered Suite on the eastern lobe of the Bushveld Igneous Complex. The zones are dominated by belts of norite, gabbro, anorthosite and pyroxenite with localised protrusions of magnetite, chromitite, serpentinised, harzburgite, olvine diorite, shale, dolomite and quartzite. The deep, loamy Valsriver soils are found on the plains, while the shallow Glenrosa soils are characteristic of the low-lying, rocky hills (Mucina and Rutherford, 2006).

The Sekhukhune Mountain Bushveld is dominated by rocks associated with the eastern Rustenburg Layered Suite of the Bushveld Igneous Complex with three sub suites or zones, the Croydon, Dwars River and Dsjate present. These are made up of norite, pyroxenite, anorthosite, and gabbro. A wide variety of soils are present associated with the complex geological composition (Mucina and Rutherford, 2006).

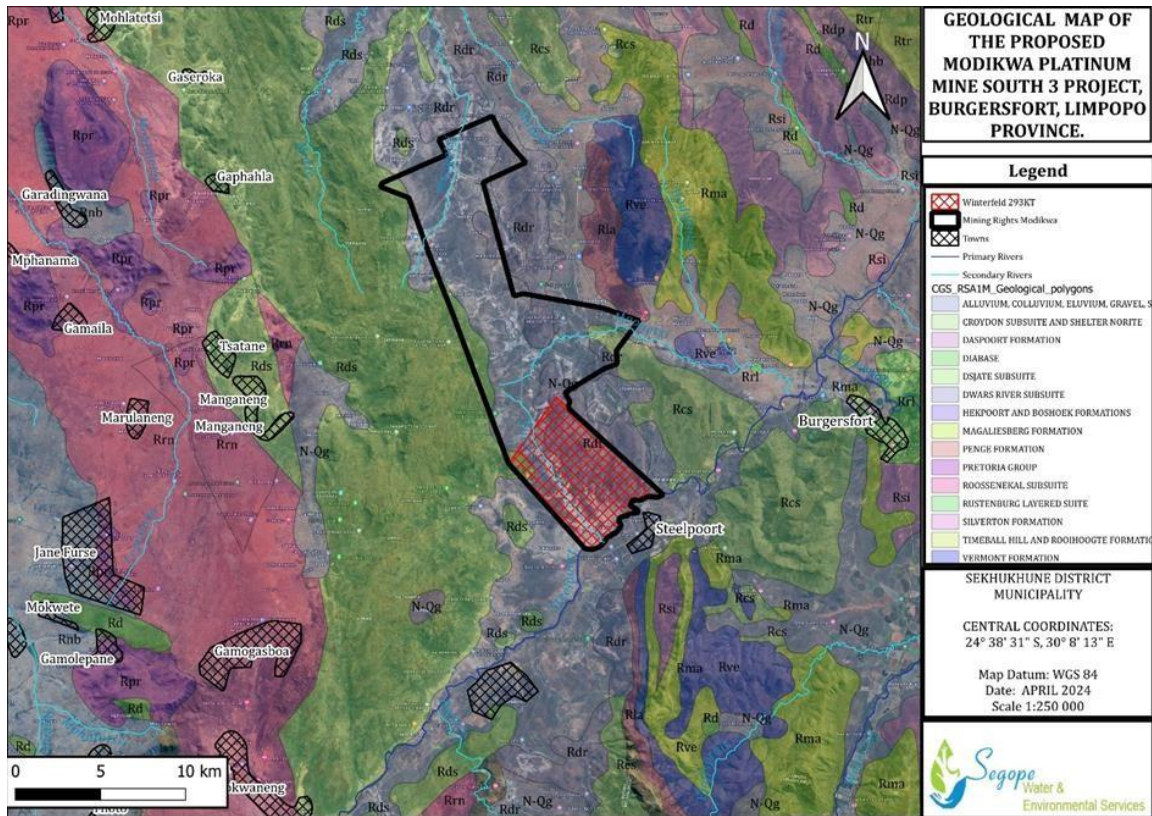


Figure 5: Map of the Geology of the proposed site

3.1.4 Drainage, river and wetland ecosystem context

The proposed site for the project falls within the B41J catchment, which is in the Olifants Water Management Area. The operation will fall in between the Mofafa river catchment as well as the Tubatsane river catchment. Both of which are tributaries of the Steelpoort River, which is a major tributary of the Olifants River.

Quaternary Map of South 3 Project Modikwa Platinum Mine




Figure 6: Map of the Quaternary Catchment of the proposed site

3.1.5 Description of vegetation and flora

The proposed site for Modikwa Platinum Mine South 3 project is situated within two vegetation types: these are Sekhukhune Mountain Bushveld (SVCB28) and Sekhukhune Plains Bushveld (SVCB 27).

3.1.5.1 National vegetation

Sekhukhune Mountain Bushveld occurs on dry, open to closed microphyllous and broad-leaved savanna on hills and mountain slopes that form concentric belts parallel to the northeastern escarpment. This open bushveld is often associated with having ultramafic soils on southern parts. The bushveld on ultramafic soils contain a high diversity of edaphic specialists. The Bushveld of mountain slopes are generally taller than those in the valleys, and a well-developed herb layer. The bushveld found in the valleys and dry northern aspects are usually dense, like thicket, with an herbaceous layer that comprises of many short-lived perennials. Dry habitats contain a number of species with xerophytic adaptations, such as succulence and underground storage organs. Both man-made and natural erosion dongas occur on footslopes of clays rich in heavy metals. An increasing area along the Dwars River Subsite is under pressure from mining activities and its associated urbanisation.



Sekhukhune Plains Bushveld occurs mainly on semi-arid plains and open valleys between chains of hills and small mountains that run parallel to the escarpment. It is dominated by short, open to close thornveld with an abundance of Aloe species and other succulents. It is heavily degraded in some places and overexploited by man for cultivation, mining and urbanisation. Both man-made and natural erosion dongas occur in areas containing clays rich in heavy metals. Encroachment by indigenous microphyllous trees and invasion by alien species is common throughout the area. There is a high level of degradation of much of the remaining vegetation by unsustainable harvesting and utilisation.

3.1.5.2 Species of conservation concern

Plants species that are considered species of conservation concern are those that are considered threatened, rare or are declining in numbers.

3.1.5.3 Alien invasive species

There were three alien species that were identified on site. Although they are not indigenous to the country they are have been classified as naturalised species, two of which (*Acacia longifolia* (Andrews) Wild and *Eucalyptus camaldulensis* Dehnh.) are considered category 1b (according to NEMBA Alien and Invasive Species Regulations (2020)), these invasive species and must be controlled. The last identified alien species (*Euphorbia serpens* Kunth) is not considered invasive and is not listed on the NEMBA Alien and Invasive Species Regulations.

3.1.6 Description of fauna

South Africa has a wide variety of faunal species, with about 1663 different vertebrate species. Within the province of Limpopo there are about 236 reptile species, 64 amphibian species, 299 mammal species and about 675 bird species.

3.1.6.1 Amphibians

During the desktop study no amphibian species were observed on the proposed site.

3.1.6.2 Reptiles

During the desktop study no reptile species were observed on the proposed site.

3.1.6.3 Mammals

During the desktop study no mammal species were observed on the proposed site.

3.2 Site Assessment

3.2.1 Vegetation types and land uses on site

The vegetation types that have been observed within the area of the proposed site are Sekhukhune Plains Bushveld and the Sekhukhune Mountain Bushveld. The footprint of the proposed mine however falls within the Sekhukhune Plains Bushveld.

The current dominant land use in the area of interest is human settlement and subsistence farming (cattle grazing). Agricultural land uses will be prevented by the mining activities as livestock grazing rangelands within the proposed project site area are going to be mined and this may also slightly impede the free movement of livestock to access the vegetation area higher up the mountain all project phases.

3.2.2 Plant species identified on site

The total of plant species that were identified during the site visit was 34 of these species 27 fell into the category of least concern, while 3 were not evaluated as they are naturalised exotic species. One protected species was identified as well as one which is considered threatened.

Table 5: Plant species found on site

Species Name	Common name	Conservation Status	Ecology
<i>Maerua parvifolia</i> Pax.	Dwarf bush-cherry	Least Concern (LC)	Indigenous
<i>Gymnosporia senegalensis</i> (Lam.) Loes	Confetti tree	Least Concern (LC)	Indigenous
<i>Aloe aculeate</i> Pole-Evans	Ngopanie		
<i>Aloe wickensii</i> Pole-Evans	Wicken's aloe		
<i>Draceane hydcinthoides</i> (L) Mabb.	Snake plant		
<i>Gymnosporia buxifolia</i> (L) Szysyl	Common spike thorn	Least Concern (LC)	Indigenous
<i>Ximenia Americana</i> L.	Tallowwood	Least Concern (LC)	Indigenous
<i>Cynanchum viminale</i> (L) L.		Least Concern (LC)	Indigenous
<i>Euphorbia tirucalli</i> L.		Least Concern (LC)	Indigenous
<i>Grewia bicolor</i> Juss.	White raisin	Least Concern (LC)	Indigenous
<i>Grewia flava</i> DC.	Brandy bush		Indigenous

Species Name	Common name	Conservation Status	Ecology
<i>Euphorbia serpens</i> Kunth	Matted sandmat	Not Evaluated	
<i>Adansonia digitate</i> L.	Baobab Tree	Least Concern (LC) (protected)	Indigenous
<i>Dodonaea viscosa</i> Jacq	Florida hopbush	Least Concern (LC)	Indigenous
<i>Spirostachys Africana</i> Sond.	Tamboti	Least Concern (LC)	Indigenous
<i>Berchemia zeyheri</i> (Sond.) Grubov	Red ivory wood	Least Concern (LC)	Indigenous
<i>Evolvulus alsinoides</i> (L.) L	Dwarf-morning glory	Least Concern (LC)	Indigenous
<i>Searsia lancea</i> (L.f) F.A Barkley	Karee	Least Concern (LC)	Indigenous
<i>Heteropogon contortus</i> (L.) P.Beauv.ex Roem	Black spear grass	Least Concern (LC)	Indigenous
<i>Terminalia prunioides</i> M.A. Lawson	Purple fruited cluster leaf	Least Concern (LC)	Indigenous
<i>Vachellia karoo</i> (Hayne) Banfi & Galasso	Sweet-thorn	Least Concern (LC)	Indigenous
<i>Dittrichia graveolens</i> (L) Greater	Camphor inula	Not Evaluated	
<i>Acacia longifolia</i> (Andrews) Wild	Golden Wattle	Not Evaluated	
<i>Cordia monoica</i> Rox	Snot Berry	Least Concern (LC)	Indigenous
<i>Kirkia wilmsii</i> Engl.	Mountain Seringa	Least Concern (LC)	Indigenous
<i>Asparagus racemorus</i> Wild.	Asparagus-fern	Least Concern (LC)	Indigenous
<i>Dichrostachys cinera</i> (L) Wight & Arn	Marabou-thorn	Least Concern (LC)	Indigenous
<i>Vachellia tortillis</i> (Forssk)Galasso & Banfi	Umbrella-thorn	Least Concern (LC)	Indigenous
<i>Flacourtia indica</i> (Burm.f.) Merr	Governor's plum	Least Concern (LC)	Indigenous
<i>Commelina Africana</i> L	Wandering Jew	Least Concern (LC)	Indigenous
<i>Euphorbia aeruginasa</i> Schweick	Crimson needle	Least Concern (LC)	Indigenous
<i>Justicia heterocarpa</i> T Anderson		Least Concern (LC)	Indigenous

Species Name	Common name	Conservation Status	Ecology
<i>Eucalyptus camaldulensis</i> Dehnh.	Murray red gum	Not Evaluated	







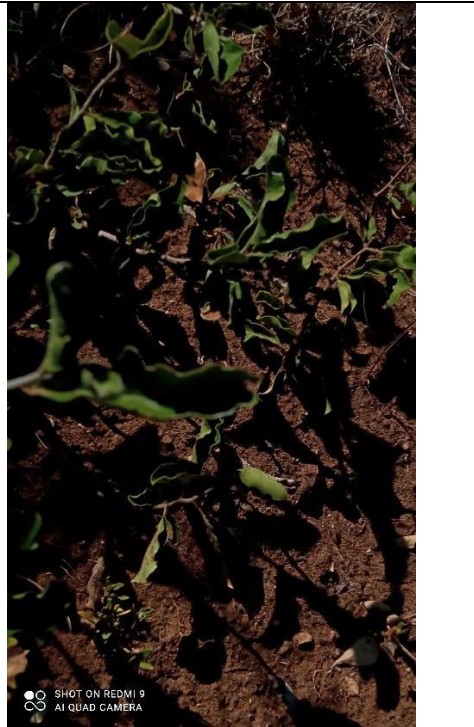






Figure 7: Plant species found on site



4 Impact Assessment

The potential issues that were shown to be relevant and lead to the potential impacts on the terrestrial ecology of this study area include:

- Impacts on terrestrial biodiversity.
- Impacts on sensitive habitats.
- Impacts on ecosystem function.
- Potential of increase of erosion.
- Potential increase in alien invasive species.

The impacts that were considered are as follows:

Impact 1: Loss or fragmentation of indigenous natural vegetation

Construction of infrastructure may lead to direct loss of vegetation. This may lead to localised or more extensive reduction in the overall extent of vegetation. There are factors that may aggravate this potential impact.

Consequences of the potential impact of loss of indigenous natural vegetation occurring may include: 1. Negative change in conservation status of habitat (Driver et al. 2005). 2. Increased vulnerability of remaining portions to future disturbance. 3. General loss of habitat for sensitive species. 4. Loss in variation within sensitive habitats due to loss of portions of it.

Impact 2: Loss of individuals of protected tree species.

Some tree species in South Africa is protected in terms of the National Forest Act (Act No. 84 of 1998). These tree species require special permits to remove.

Consequences may include: 1. Change in age profile of trees in the area. 2. Reduction in area of occupancy of affected species; and 3. Loss of genetic variation within affected species. No person may cut, disturb, damage, or destroy any protected tree or possess, collect, remove, transport, export, purchase, sell, donate or in any other manner acquire or dispose of any protected tree or any forest product derived from a protected tree, except under a license or exemption granted by the Minister to an applicant and subject to such period and conditions as may be stipulated.

Impact 3: Establishment and spread of declared weeds and alien invader plants.

Major factors contributing to invasion by alien invader plants includes inter alia high disturbance (such as clearing for construction activities) and negative grazing practices. Exotic species are often more prominent near infrastructural disturbances than further away. Consequences of this may

include: 1. Loss of indigenous vegetation. 2. Change in vegetation structure leading to change in various habitat characteristics. 3. Change in plant species composition. 4. Change in soil chemical properties. 5. Loss of sensitive habitats. 6. Loss or disturbance to individuals of rare, endangered, endemic and/or protected species. 7. Fragmentation of sensitive habitats. 8. Change in flammability of vegetation, depending on alien species. 9. Hydrological impacts due to increased transpiration and runoff; and 10. Impairment of wetland function. There are several alien species that may become problematic in the study area. There is therefore the potential for alien plants to spread or invade following disturbance on site.

Impact 4: Potential increase in erosion due to clearance of vegetation.

Vegetation cover establishes areas of soil stability. Clearance of vegetation may lead to rapid soil erosion. Consequences of this may include: 1. Loss of indigenous vegetation. 2. Change in plant species composition. 3. Change in soil chemical properties. 4. Fragmentation of sensitive habitats. 5. Hydrological impacts due to increased transpiration and runoff; and 6. Loss of soil layers

Table 6: Impact assessment on the loss of protected tree species

Impact Description		Impact Type	Extent (E)	Duration (D)	Potential	Likelihood	Impact Rating & Significance	Mitigation & Management Measures
Impact	Direct	Significance without Mitigation						All the Baobab trees on site must be surveyed and recorded before any construction can commence. An ECO together with qualified botanist/ecologist should do a walkabout and tag all the Baobabs that need to be removed. The appropriate tree remove permit should be obtained from the Department of Forestry, Fisheries, and the Environment.
Impact Direction:	Negative	Existing Impact	2	3	4	0.7		
Aspect	Clearance of vegetation	Projected Impact	2	3	4	0.7		
Potential Impact		Significance with Mitigation						
Loss of protected tree species	Residual Impact	2	2	2	5	0.2	Description of Cumulative Impact	
	Reversibility	Low reversibility						
	Irreplaceability	Low irreplaceability						
	Cumulative Impact							
	Cumulative Impact	1	1	1	0.1	High	The Baobab trees are considered to be of least concern and grow easily. These trees can be grown in a controlled environment for a number of years before being transplanted to the open.	
	Confidence							

Table 7: Impact assessment on the further establishment and spread of alien plant species

Impact Description		Impact Type	Extent (E)	Duration (D)	Potential	Likelihood	Impact Rating & Significance	Mitigation & Management Measures
Impact	Direct	Significance without Mitigation						Alien invasive plants that are found on the proposed site must be controlled through either chemical or physical removal means. An Alien Species Management Plan must be drafted and implemented to ensure that these species are controlled.
Impact Direction:	Negative	Existing Impact	2	3	8	0.7	5	
Aspect	Clearance of vegetation	Projected Impact	2	3	8	0.7	5	
Potential Impact		Significance with Mitigation						<p>Description of Cumulative Impact</p> <p>If alien invasive plants are left unattended they have the potential to out compete indigenous vegetation within the proposed site and the areas around it.</p>
Further establishment and spread of alien plant species		Residual Impact	2	2	2	0.2	2	
		Reversibility	High reversibility					
		Irreplaceability	Low irreplaceability					
		Cumulative Impact						
		Cumulative Impact	2	1	4	0.7	5	
Confidence		Medium						

Table 8: Impact assessment on the further fragmentation of indigenous vegetation/faunal habitat due to vegetation clearance

Impact Description		Impact Type	Extent (E)	Duration (D)	Potential	Likelihood	Impact Rating & Significance	Mitigation & Management Measures
Impact	Direct Impact	Significance without Mitigation						All vegetation clearance must be limited to the approved areas. All vehicles must be restricted to the demarcated construction roads to ensure that vegetation loss is not lost
Impact Direction:	Negative	Existing Impact	2	4	8	0.7	5	

Aspect		Projected Impact	2	4	8	0.7	5		unnecessarily. All areas affected by the construction must be rehabilitated using indigenous plant species. If possible, vegetation clear should occur in the winter season so not to disturb the breeding season of some bird species
Potential Impact	Significance with Mitigation								
Further fragmentation of indigenous vegetation/faunal habitat due to vegetation clearance	Residual Impact	2	2	4	0.2				
	Reversibility	Moderate reversibility							
	Irreplaceability	Moderate irreplaceability							
	Cumulative Impact								
	Cumulative Impact	2	1	2	0.2				The current vegetation make-up of the proposed shows that there is an encroachment of alien species as a result of the area being previously used as farmlands. The removal of the vegetation on site could increase the chances of alien species establishing and further breaking up the size of indigenous species
Confidence	Medium								

Table 9: Impact assessment on further soil erosion

Impact Description		Impact Type	Extent (E)	Duration (D)	Potential	Likelihood	Impact Rating & Significance	Mitigation & Management Measures	
Impact	Direct	Significance without Mitigation						Vegetation clearing should only be done in areas where work is being carried out. Erosion control measures must be put in place throughout the construction, operations and decommission phases. without work being conducted in that specific area. Revegetation of cleared areas must be undertaken as soon as possible. Topsoil stockpiles must be protected from erosion. Topsoil must be protected from getting washed into drainage ways.	
Impact Direction	Negative	Existing Impact	2	4	8	0.7	5		
Aspect	Vegetation clearance	Projected Impact	2	4	8	0.7	5		
Potential Impact	Significance with Mitigation								
Further soil erosion	Residual Impact	2	3	4	0.5				
	Reversibility	Moderate reversibility							
	Irreplaceability	Low irreplaceability							
Cumulative Impact								Description of Cumulative Impact	

	Cumulative Impact	2	2	4	0.5		Erosion of topsoil will lead to difficulty of establishment of vegetation cover as Topsoil contains seeds and organic materials needed for cover establishment.	
	Confidence	Medium						

Table 10: Impact assessment of further disruption to ecological function and processes

Impact Description		Impact Type	Extent (E)	Duration (D)	Potential	Likelihood	Impact Rating & Significance	Mitigation & Management Measures
Impact	Direct	Significance without Mitigation						Vegetation clearing must be done within the demarcated areas. All rehabilitation efforts must be met according to the rehabilitation plan to ensure some restoration of ecological function and process.
Impact Direction	Negative	Existing Impact	2	3	4	5	0.7	
Aspect		Projected Impact	2	3	4	5	0.7	
Potential Impact		Significance with Mitigation						
		Residual Impact	1	2	2	0.2		
		Reversibility	Moderate reversibility					
		Irreplaceability	Low irreplaceability					
		Cumulative Impact						
Further disruption to ecological function and processes		Cumulative Impact	1	1	1	0.2		
		Confidence	Medium					
							Description of Cumulative Impact	The proposed site has already been disrupted due to past land use. This impact occurs when more and more areas are cleared and increases the isolation of functional ecosystems and reduced biodiversity.

5 Impact statement, conclusion and recommendation

5.1 Recommendations for the proposed activity and EA and EMPr

The finding and recommendations from this report should be included in the Environmental Impact Assessment Report that is being prepared on behalf of Modikwa Platinum Mine as required by the section 3.2 of the Terrestrial Biodiversity Protocol of 2020. The mitigation and monitoring measures that have been identified within the report must be incorporated into the EMPr as it is relevant.

All the mitigation measures that are provided in this report must be implemented during the Planning and Design, Construction, Operational and Decommissioning phases of this proposed activity.

Table 11: Recommendations and mitigations

Prevent impact	Minimise impact	Mitigate impact
Planning and Design phase		
All required permits must be obtained for the removal and/or disturbance of any protected or species of concern found on the proposed site.	All designs must ensure that there is as minimal loss as possible of any vegetation that is indigenous and as near natural.	An Alien Vegetation Management Plan must be developed by the Contractor before the commencement of any construction. This plan must be approved by the appointed ECO before it can be implemented.
	Only the vegetation that is found within the demarcated footprint of the proposed site may be removed or disturbed.	A rehabilitation plan must be developed by the project manager as part of the method statement and must be implemented during both the construction and the operational phases. The method statement must be approved by the appointed ECO before it can be implemented.
Construction phase		
A walkthrough must be done of the proposed development site. This should be done in collaboration with a qualified botanist to identify the SCC that occur on site. This should be done during the flowering season.	All vegetation clearing must be kept within the demarcated boundary of the proposed site's footprint.	All areas that are impacted by the construction activities must be rehabilitated in accordance with the Rehabilitation Plan. As soon as construction work is completed.
No SCC plants may be removed without the relevant permits.	Construction vehicles and any machinery may not go to areas demarcated as highly-sensitive, 'no-go' or areas that are outside of the project boundary.	All trenches or excavations must be backfilled and all areas that are disturbed must be backfilled, compacted and revegetated which possible.

The ECO must monitor for any potential SCC that were not identified during the walkthrough	All lay down areas must not be located within any watercourses, drainage lines or sensitive areas.	Topsoil must be stored in areas of low sensitivity and used for the rehabilitation of impacted areas that are not required during the operational phase.
A search and rescue mission must be conducted for any faunal species that may occur on site, before any clearing activity may take place.	All staff and contractors are not permitted to create any fires during the construction phase.	Only species that are indigenous must be used for the rehabilitation process.
No staff and members or contractors may capture, collect or eat any faunal species found on site.	Vehicles and machinery must meet best practice standards.	The Alien Invasive Management Plan for the site must be implemented.
	If possible, clearing of the trees on site should be carried out in the winter season, so not to disturb any birds that nest and rear their young under the spring and summer months.	
	Any faunal species that die as a result of construction activities must be documented. (i.e. photographed, coordinates taken. Identified).	
	The appointed ECO must ensure that they monitor that all construction activities are within the demarcated boundary of the proposed project.	
Operational Phase		
	The Alien Invasive Management Plan must be implemented. The ECO must ensure to monitor	The rehabilitation Plan must be implemented during the operational phase



	that this plan is implemented effectively.	
Decommissioning Phase		
		The alien invasive management plan for the site must be implemented.
		Only indigenous species must be used for rehabilitation.
		ECO must be appointed to oversee the rehabilitation process.

5.2 Fatal Flaws

No **fatal flaws** were identified during this study in the opinion of the specialist.

5.3 Environmental statement and opinion of the specialist

The ecological impacts of the aspects of the proposed mining project have been assessed and are considered acceptable, as long as the mitigation measures are implemented as they are supposed. The mitigation measures recommended should reduce any impacts rated between high to medium or low

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7 Appendices

The lists below indicate the faunal species that are known to exist in areas that surround the proposed mining site and may also exist within the mining area.

7.1 Mammals

The list below comprises of mammals that have been identified and have range within the area that includes the proposed site.

Table 12: List of mammals found within the area that includes the proposed site.

Scientific Name	Common Name	Conservation Status	Source
<i>Chlorocebus pygerythrus</i>	Vervet Monkey	Least Concern (LC)	iNaturalist
<i>Hippotragus niger</i>	Sable Antelope	Least Concern (LC)	iNaturalist
<i>Tragelaphus strepsiceros</i>	Greater Kudu	Least Concern (LC)	iNaturalist
<i>Procavia capensis</i>	Rock Hyrax	Least Concern (LC)	iNaturalist
<i>Cryptomys hottentotus</i>	Common Mole rat	Least Concern (LC)	iNaturalist
<i>Tragelaphus oryx</i>	Common Eland	Least Concern (LC)	iNaturalist
<i>Lupulella mesomelus</i>	Black-backed Jackal	Least Concern (LC)	iNaturalist
<i>Aepyceros melampus</i>	Impala	Least Concern (LC)	ICUN online
<i>Hippotragus equinus</i>	Roan antelope	Least Concern (LC)	ICUN online
<i>Sylvicapra grimmia</i>	Common Duiker	Least Concern (LC)	ICUN online
<i>Robus ellipsiprymnus</i>	Water buck	Least Concern (LC)	ICUN online
<i>Oreotragus oreotragus</i>	Klipspringer	Least Concern (LC)	ICUN online
<i>Ourebia ourebi</i>	Oribi	Least Concern (LC)	ICUN online
<i>Pelea capreolus</i>	Grey Rhebok	Near Threatened (NT)	ICUN online
<i>Redunca fulvorufula</i>	Mountain Reed	Endangered (EN)	ICUN online
<i>Syncerus caffer</i>	African Buffalo	Near Threatened (NT)	ICUN online
<i>Helogale parvula</i>	Common Dwarf Mongoose	Least Concern (LC)	ICUN online
<i>Equus quagga</i>	Plains Zebra	Near Threatened (NT)	ICUN online
<i>Crocuta crocuta</i>	Spotted Hyaena	Least Concern (LC)	ICUN online
<i>Mungos mungo</i>	Banded Mongoose	Least Concern (LC)	ICUN online

7.2 Amphibians

The list below comprises of amphibians that have been identified and have range within the area that includes the proposed site.

Table 13: list of amphibians found within the area that includes the proposed site.

Scientific Name	Common Name	Conservation status	Source
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<i>Poyntonophrynus fenoulheti</i>	Fenoulhet's Toad	Least Concern (LC)	iNaturalist
<i>Amietia delalandii</i>	Common River Frog	Least Concern (LC)	iNaturalist
<i>Xenopus laevis</i>	African clawed frog	Least Concern (LC)	ICUN online

7.3 Birds

The list below comprises of birds that have been identified and have range within the area that includes the proposed site

Table 14: List of birds found within the area that includes the study site

Scientific Name	Common Name	Conservation status	Source
<i>Chrysococcyx caprius</i>	Diederik cuckoo	Least Concern (LC)	iNaturalist
<i>Tockus leucomelas</i>	Southern yellow-billed hornbill	Least Concern (LC)	iNaturalist
<i>Batis molitor</i>	Chinspot batis	Least Concern (LC)	iNaturalist
<i>Motacilla aguimp</i>	African Pied wagtail	Least Concern (LC)	iNaturalist
<i>Cinnyris talatala</i>	White-breasted sunbird	Least Concern (LC)	iNaturalist
<i>Lanius collaris</i>	Southern fiscal	Least Concern (LC)	iNaturalist
<i>Microcarbo africanus</i>	Long-tailed cormorant	Least Concern (LC)	iNaturalist
<i>Calidris ferruginea</i>	Curlew Sandpiper	Near Threatened (NT)	ICUN online
<i>Anninga rufa</i>	African Darter	Least Concern (LC)	ICUN online
<i>Rostratula benghulensis</i>	Greater painted snipe	Least Concern (LC)	ICUN online
<i>Sarkicliornis melantos</i>	Knob-billed duck	Least Concern (LC)	ICUN online
<i>Muscivapa striata</i>	Spotted flycatcher	Least Concern (LC)	ICUN online
<i>Butorides striata</i>	Green-backed Heron	Least Concern (LC)	ICUN online
<i>Curruca communis</i>	Common Whitethroat	Least Concern (LC)	ICUN online

7.4 Reptiles

The list below comprises of reptiles that have been identified and have range within the area that includes the proposed site

Table 15: List of reptiles found within the areas that includes the study area

Scientific Name	Common Name	Conservation Status	Source
Lizards			
<i>Platysaurus orientalis</i>	Sekukhune flat lizard	Least Concern (LC)	iNaturalist
<i>Nucras ornata</i>	Ornate scrub lizard	Least Concern (LC)	iNaturalist
<i>Smaug vandami</i>	Van Dam's girdled lizard	Least Concern (LC)	iNaturalist
<i>Cordylus vittifer</i>	Common girdled lizard	Least Concern (LC)	iNaturalist
Snakes			
<i>Telescopus semiannulatus</i>	Common tiger snake	Least Concern (LC)	iNaturalist
<i>Psammophis brevirostris</i>	Short-snout whip snake	Least Concern (LC)	iNaturalist

<i>Python natalensis</i>	Southern African python	Vulnerable (VU)	iNaturalist
<i>Crotaphopeltis hotamboeia</i>	Red-lipped snake	Least Concern (LC)	iNaturalist
<i>Lamprophis guttatus</i>	Spotted house snake	Least Concern (LC)	iNaturalist
<i>Bitis arietans</i>	Puff Adder	Least Concern (LC)	ICUN online
<i>Indotyphlops braminus</i>	Brahming Blind snake	Least Concern (LC)	ICUN online
Geckos			
<i>Pachydactylus van soni</i>	Van son's thick bed gecko	Least Concern (LC)	iNaturalist
<i>Hemidactylus mabouia</i>	Tropical house gecko	Least Concern (LC)	iNaturalist
<i>Afroedura leoloensis</i>	Leolo rock gecko	Least Concern (LC)	iNaturalist
<i>Lygodactylus nigropunctatus</i>	Black-spotted dwarf gecko	Least Concern (LC)	iNaturalist
<i>Homopholis wahlbergii</i>	Wahlberg's velvet gecko	Least Concern (LC)	iNaturalist
<i>Pachdactylus affinis</i>	Transvaal gecko	Least Concern (LC)	iNaturalist
Skink			
<i>Trachylepis margaritifera</i>	Rainbow skink	Least Concern (LC)	iNaturalist
<i>Trachlepis varia sensu stricto</i>	Common variable skink	Data Deficient	iNaturalist
Chameleon			
<i>Chamaeleo dilepis</i>	Common African flap necked chameleon	Least Concern (LC)	ICUN online