TERRESTRIAL BIODIVERSITY ASSESSMENT:

FOR THE PROPOSED MINING RIGHT APPLICATION FOR THE PROPOSED MINING OF COAL ON THE REMAINING EXTENTS OF PORTIONS 18, 21, 55, 64, 69, 85, 213 OF FARM TENBOSCH 162 JU, PORTIONS 2, 5 AND 6 OF FARM TURFBELT 593 JU AND FARM TECKLENBURG 548 JU BARBERTON MANAGERIAL DISTRICT OF THE MPUMALANGA PROVINCE

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DECLARATION

Mawenje Consulting Africa (MCA) Pty (Ltd) has no vested interest in the property studied nor is it affiliated with any other person/body involved with the property and/or proposed development. Mawenje Consulting Africa Pty (Ltd) is not a subsidiary, legally or financially of the proponent.

The study was undertaken by Mr Tshuxekani Maluleke, He holds Professional Natural Scientists qualifications with the following details:

QUALIFICATIONS

SPECIALIST	QUALIFICATION
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Executive Summary

INTRODUCTION

Mawenje Consulting Africa (MCA) (Pty) Ltd, was appointed by Myezo Environmental Management Services (Pty) Ltd on behalf of the Tenbosch Mining (Pty) Ltd to conduct a comprehensive Terrestrial Biodiversity Assessment for the Mining Right Application For The Proposed Mining Of Coal On The Remaining Extents Of Portions 18, 21, 55, 64, 69, 85, 213 Of Farm Tenbosch 162 Ju, Portions 2, 5 And 6 Of Farm Turfbelt 593 Ju And Farm Tecklenburg 548 Ju Barberton Managerial District Of The Mpumalanga Province. The site is inspection was restricted to the Farm Tecklenburg 548 JU where the excavation shaft and associated infrastructure will be located, the rest of the properties will be assessed in Spring (September 2022).

PROJECT DESCRIPTION

The mining method proposed undergrounding mining which involves the extraction of coal from a pit developed from the earth's surface. The pit at the site will be worked by cutting a bench which will be progressed in a north-easterly direction. The mining methods will include blasting with explosives to loosen the hard rock (overburden) when necessary. The material will be loaded with excavators and hauled to the mobile crushing and screening plants that will be established within the boundaries of the mining area. The coal will be stockpiled and transported to clients via trucks and trailers. All activities will be contained within the boundaries of the mining site.

LIMITATIONS AND ASSUMPTIONS

This report is based on current available information and, as a result, the following limitations and assumptions are implicit:

- The report is based on a project description received from the client.
- Species of Conservation Concern (SCC) are difficult to find and difficult to identify, thus species described in this report do not comprise an exhaustive list. It is almost certain that additional SCCs will be found during construction and operation of the development.
- Sampling could only be carried out at one stage in the annual or seasonal cycle. The survey was conducted during the dry season when most plants are in the middle of their . Some flowering species, specifically geophytes could therefore not be identified. However, the time available in the field, and information gathered during the survey was sufficient to provide enough information to determine the status of the affected area.
- The inspection was restricted to the Farm Tecklenburg 548 JU due to time constraints, the rest of the properties will be inspected in September 2022 during spring.

DISCUSSION

The proposed project area (the Farm Tecklenburg 548 JU) is located in an area that is regarded as ecologically intact, moderate in plant species diversity with a large number of endemic species. The area has evidence of disturbance from of wood harvesting, farming activities and grazing. According to the risk assessment the proposed project and associated infrastructures will place additional pressure on the environment especially on the fauna; that will be subjected to increased human presence, reduction in habitat and elevated noise levels. The results of the fauna survey indicate that fauna activity within the area might decline as a result of the proposed mining activities around the area. Further to this, the cumulative loss of fauna and flora is expected. The proposed project is traverses an Ecological Support Area (ESA) and is characterised by the vulnerable vegetation types. A large percentage of the vegetation type is already transformed (Mucina and Rutherford, 2006). The proposed mining activities will be restricted to the mining right properties. The loss of habitat will result in the Loss of endemic plant

diversity in the study site, which will have a knock down effect on the loss of faunal biodiversity and a resultant loss of faunal SSC. This is of specific relevance to invertebrates since they are dependent on those plant species. Due to the nature of the proposed development, the impact is expected to be negative. The impacts can be minimised by employing the relevant mitigation measures.

CONCLUSION AND RECOMMENDATIONS

The site inspection was conducted during dry season, and thus there are plant species that may have been missed or misidentified. Some plant species that emerge and bloom during another time of the year or under very specific circumstances may have been missed entirely. It is important to schedule a follow-up site inspection in order to update the report where necessary, including the development of additional fine scale maps that will capture the sensitivity of the site.

The sites were surveyed on the 09th of July 2022 to ascertain the overall state of biodiversity. According to the South African National Biodiversity Institute (SANBI) the proposed mining traverses an Ecological Support Area (ESA) is classified as a (ESA), this implies that a Ecological Support Areas are not essential for meeting biodiversity targets but play an important role in supporting the ecological functioning of Critical Biodiversity Areas and/or in delivering ecosystem services. The proposed site has suffered veld transformation due to the farming, human settlements and poor veld management. Due to seasonality issues, a follow-up site visit will be done in spring to verify the findings of this report.

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LIST OF ABBREVIATIONS

ALARP	As Low as Reasonably Practicable
BES	Biodiversity and Ecosystem Services
CARA	Conservation of Agricultural Resources Act
CBA	Critical Biodiversity Area
CBD	Convention on Biological Diversity
CR	Critically Endangered
ESA	Ecological Support Areas
EN	Endangered
GIS	Geographic Information System
I&APS	Interested & Affected Parties
IPPC	International Plant Protection Convention
IUCN	International Union for Conservation of Nature
LC	Least Concern
NBF	National Biodiversity Framework
NEMA	National Environmental Management Act (Act 107 of 1998)
NFEPA	National Freshwater Ecosystem Priority Areas
NT	Near Threatened
PA	Protected Areas
SANBI	South African National Biodiversity Institute
SSC	Species of Special Concern
VU	Vulnerable

DEFINITIONS

Alien animal	(a) Any live vertebrate, including a bird and a reptile, but excluding a fish, belonging to a species or subspecies that is not a recognised domestic species and the natural habitat of which is not in the Republic; or (b) The egg of such vertebrate.
Biodiversity	Means the diversity of animals, plants or other organisms, including the diversity of animals, plants or other organisms found within and between— (a) Ecosystems; (b) Habitats; (c) The ecological complexes of which these systems and habitats are part; and (d) Species.
CITES	Means the Convention on International Trade in Endangered Species of Wild Fauna and Flora;
Endangered Species	Means a species is endangered when it is facing a very high risk of extinction in the wild in the near future and includes— (*a*) Any living or dead specimen of such a species; or (*b*) Any egg, skin, bone, feather, seed, flower or any other part or derivative of such a species.
Environment	Means the surroundings within which humans exist and that are made up of— (*a*) The land, water and atmosphere of the earth; (*b*) Microorganisms, plant and animal life; (*c*) Any part or combination of (*a*) and (*b*) and the interrelationships amongst and between them; and (*d*) The physical, chemical, aesthetic and cultural properties and conditions of the foregoing that influence human health and wellbeing;
Indigenous plant	(*a*) Means any living or dead plant which is indigenous to the Republic, whether artificially propagated or in its wild state; and (*b*) Includes the flower, pollen, seed, cone, fruit, bulb, tuber, stem or root or any other part or derivative of such plant but does not include a plant declared a weed in terms of any legislation.
Protected area	Means— (*a*) A provincial nature reserves; (*b*) A site of ecological importance; (*c*) A protected environment; (*d*) A private nature reserves; or (*e*) A resource use area.
Protected environment	Means an area declared a Protected Environment or Private Nature Reserve in terms of section 21 (1) (*a*).
Rare species	Means a species of fauna and flora referred to in section 68 (*a*) (ii), and includes— (*a*) any living or dead specimen of such a species; or (*e*) any egg, skin, bone, feather, seed, flower or any other part or derivative of such a species.

1. INTRODUCTION AND PROJECT DESCRIPTION

1.1 INTRODUCTION

Mawenje Consulting Africa (MCA) (Pty) Ltd, was appointed by Myezo Environmental Management Services (Pty) Ltd on behalf of the Tenbosch Mining (Pty) Ltd to conduct a comprehensive Terrestrial Biodiversity Assessment for the Mining Right Application For The Proposed Mining Of Coal On The Remaining Extents Of Portions 18, 21, 55, 64, 69, 85, 213 Of Farm Tenbosch 162 Ju, Portions 2, 5 And 6 Of Farm Turfbelt 593 Ju And Farm Tecklenburg 548 Ju Barberton Managerial District Of The Mpumalanga Province. The study is aimed at assessing the potential impact on biodiversity of the available alternative site. The purpose of this study is to describe and characterise the terrestrial environment, habitats and species present on site. Biodiversity is defined according to the National Environmental Management: Biodiversity Act of 2004 (NEMBA), as "the variability among living organisms from all sources including, terrestrial, aquatic ecosystems and the ecological complexes of which they are part and also includes diversity within species, between species, and of ecosystems". The NEMBA legislation upholds the country's commitment to the protection of South Africa's biological resources, and it is imperative that development takes place in a sustainable way to achieve this.

1.2 BACKGROUND

Manzolwandle Investments (Pty) Ltd (Manzolwandle) (now Tenbosch Mining (Pty) Ltd (Tenbosch) submitted a mining right and environmental authorisation application to the Department of Mineral Resources and Energy (DMRE), the Competent Authority (CA) for this project. The mineral of interest for prospecting is coal, and the area is approximately 8 52.95 hectares in extent. The mining activities will be undertaken on the remaining extents of Portions 18, 21, 55, 64, 69, 85, 213 of Farm Tenbosch 162 JU, Portions 2, 5 and 6 of Farm Turfbelt 593 JU and Farm Tecklenburg 548 JU. The proposed mining area is located about 15 km west of Komatipoort Town and Lebombo is located about 20 km east of the proposed project site.

1.3 PROJECT DESCRIPTION

The mining method proposed undergrounding mining which involves the extraction of coal from a pit developed from the earth's surface. The pit at the site will be worked by cutting a bench which will be progressed in a north-easterly direction. The mining methods will include blasting with explosives to loosen the hard rock (overburden) when necessary. The material will be loaded with excavators and hauled to the mobile crushing and screening plants that will be established within the boundaries of the mining area. The coal will be stockpiled and transported to clients via trucks and trailers. All activities will be contained within the boundaries of the mining site (Refer to Figure 1).

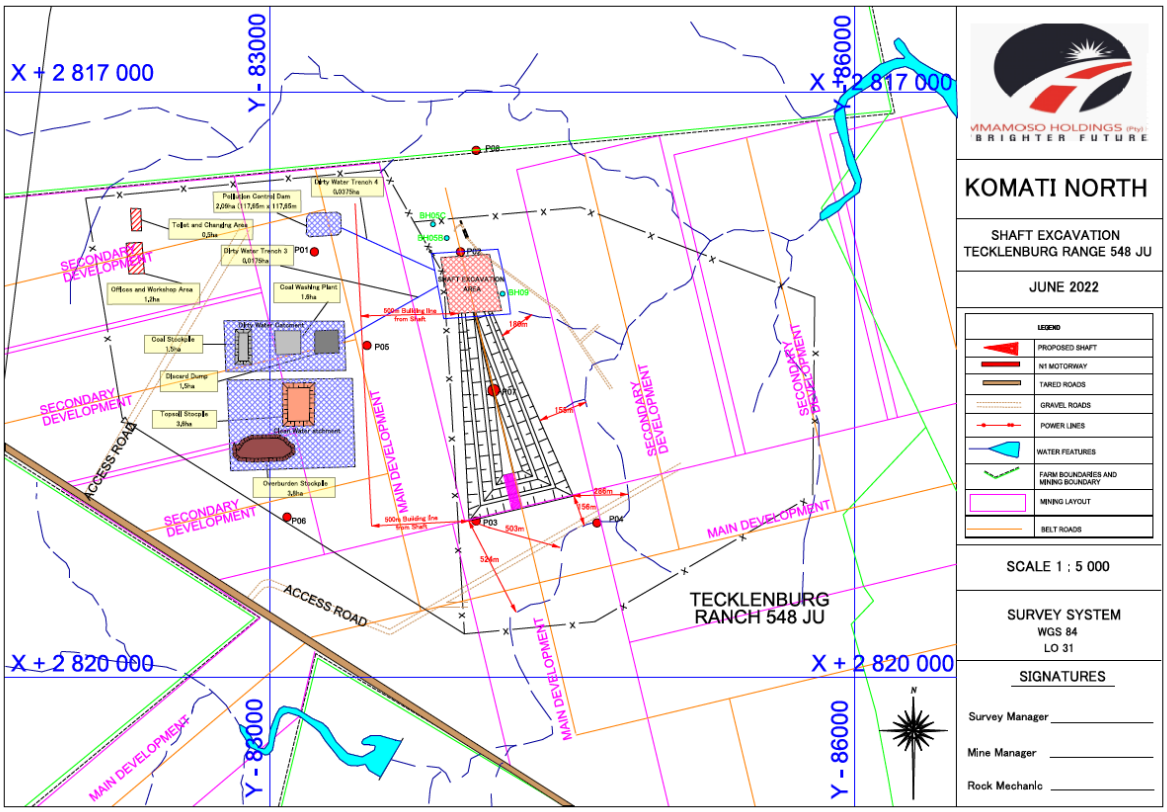


Figure 1: Mine layout Plan

1.4 STUDY AREA

The proposed site is located at the remainder of the portion of the Tecklenburg 548 JU. The site is bound by three main roads which are R582 (Coopersdal), which is on the south and on the east is Strydom Block road. The N4 to Komatipoort exists on the north at approximately 4km from the site. It should be noted that the closest or the road that have access to the site is through R582, hence there are sugar cane farms on the northern side of the area, Refer to **Figure 2**.

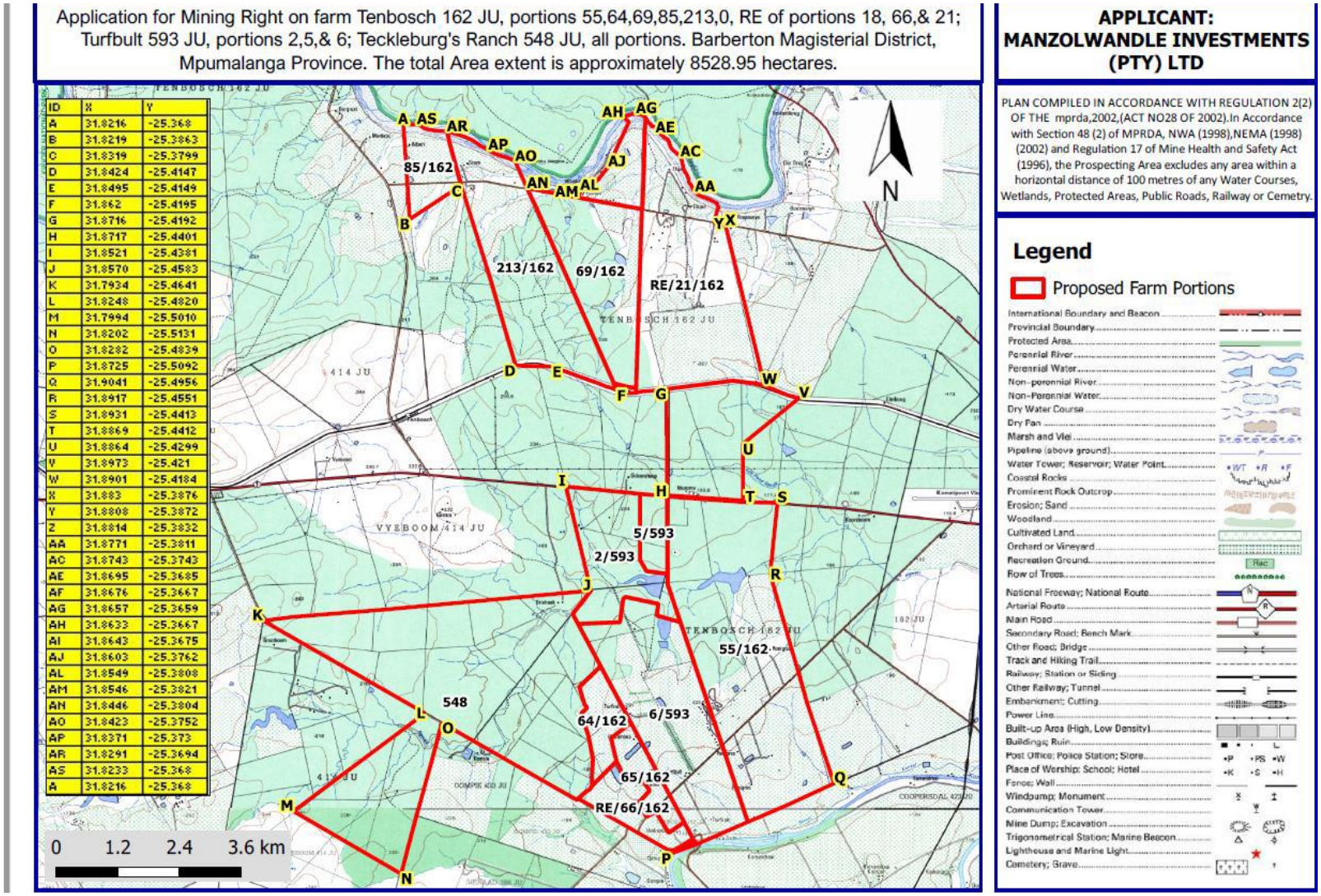


Figure 2: Locality Map

1.5 SITE SENSITIVITY VERIFICATION AND MINIMUM REPORT CONTENT REQUIREMENTS

In terms of the Protocol for the Specialist Assessment and Minimum Reporting Content Requirements for Environmental Impacts on Terrestrial Biodiversity (GN R. 320 of 2020) and Terrestrial Animal and Plant Species (GN R. 1150), 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.

According to the results of the Screening Report generated for the proposed development, the relative terrestrial biodiversity theme sensitivity is classified as **VERY HIGH** due to portions of the development occurring within Critical Biodiversity Areas (CBA). The Animal Species Theme is classified as **HIGH** while the Plant Species Theme is classified as **HIGH** Sensitivity. 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'.

Due to the very high sensitivity rating of the site, a full Biodiversity Specialist Assessment (this report) has been undertaken as part of the mining right application On The Remaining Extents Of Portions 18, 21, 55, 64, 69, 85, 213 Of Farm Tenbosch 162 Ju, Portions 2, 5 And 6 Of Farm Turfbelt 593 JU And Farm Tecklenburg 548 JU Barberton Managerial District Of The Mpumalanga Province.

1.6 TERMS OF REFERENCE AND OBJECTIVES

Mawenje Consulting Africa Consulting has been appointed to undertake the following specialist functions:

- Review of existing data and surveys of the proposed areas to be disturbed to determine:
  - Vegetation/habitat types.
  - Dominant fauna (including avifauna) and flora species, as well as rare/endangered/threatened/invasive/alien species.
  - Plants or animals that are protected by law.
  - Indicate any plants used for medicinal or cultural purposes
- Map/ or Global Position Systems (GPS) locations for plants that might be sacred, coordinates should be provided in an excel file as well.
- GPS and map rare/endangered species (coordinates should be provided in an excel file as well);
- Broad-scale structural classification of the vegetation into homogenous units;
- Describe dominant and characteristic species identified within the broad-scale plant communities comprising each of these units, will also be provided. These descriptions will be based on visual estimates of cover or abundance and density following established vegetation survey techniques;
- Map plant communities and describe dominant and characteristic species within these communities;
- Describe each vegetation unit in terms of its sensitivity, biodiversity value and conservation importance;
- Provide recommendations on aspects such as management of threatened plant species and communities, eradication or control of alien invasive species;
- Recommend species for protection in situ, translocation or use in rehabilitation practices.
- Develop a Biodiversity Management Plan in terms of National Environmental Management: Biodiversity Act (Act No.10 of 2004);
- Develop an ecological rehabilitation plan; and

1.7 LIMITATIONS AND ASSUMPTIONS

This report is based on current available information and, as a result, the following limitations and assumptions are implicit:

- The report is based on a project description received from the client.
- Species of Conservation Concern (SCC) are difficult to find and difficult to identify, thus species described in this report do not comprise an exhaustive list. It is almost certain that additional SCCs will be found during construction and operation of the development.
- Sampling could only be carried out at one stage in the annual or seasonal cycle. The survey was conducted during the dry season when most plants are in the middle of their . Some flowering species, specifically geophytes could therefore not be identified. However, the time available in the field, and information gathered during the survey was sufficient to provide enough information to determine the status of the affected area.
- The inspection was restricted to the Farm Tecklenburg 548 JU due to time constraints, the rest of the properties was inspected in March 2023 during spring.

1.8 SCOPE OF STUDY

1.8.1 FLORAL STUDY:

- Conduct fieldwork to locate and identify the current state of vegetation on the study area (Remaining Extents Of Portions 18, 21, 55, 64, 69, 85, 213 Of Farm Tenbosch 162 Ju, Portions 2, 5 And 6 Of Farm Turfbelt 593 JU And Farm Tecklenburg 548 JU), with emphasis on the footprint of the project.
- Determine the species that are present onsite.
- Identify sensitive vegetation types and critical biodiversity areas on site.
- Identify Critical Biodiversity and Ecological Support Areas onsite.
- Determine whether the mine is located within the distribution range of species listed as Vulnerable, Endangered or Critically Endangered and Protected.
- Provide photographic evidence of the current state of vegetation onsite (i.e., natural or transformed, disturbed etc.) identify and describe the conservation value and conservation planning that are relevant to the site.
- Determine alien species present onsite and the recommended management actions.
- Describe the potential direct, indirect and cumulative negative and positive impacts of the proposed activity on the vegetation species during construction, operation and decommissioning phases of the project.
- Provide monitoring requirements, mitigation measures and recommendations.

1.8.2 FAUNAL STUDY:

- Conduct fieldwork to describe and assess the current state of terrestrial fauna in the area.
- Describe the existing micro-habitats, and the species associated with those habitats.
- Provide a description of species composition and conservation status in terms of protected, endangered or vulnerable faunal species.
    - This description will include species which are likely to occur within, traverse across or forage within the proposed project area, as well as species which may not necessarily occur on site, but which are likely to be impacted upon as a result of the proposed development.

2. LEGAL FRAMEWORK

The following national and provincial legislative guidelines and requirements were followed as part of this study:

2.1 THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT (ACT NO 107 OF 1998) (NEMA) AS AMENDED

This Act embraces all three (3) fields of environmental concern namely: resource conservation and exploitation; pollution control and waste management; and land-use planning and development. The environmental management principles include the duty of care for wetlands and special attention is given to management and planning procedures. NEMA provides for co-operative, environmental governance by establishing principles for decision-making on matters affecting the environment, institutions that will promote co-operative governance and procedures for coordinating environmental functions exercised by organs of state; and to provide for matters connected therewith.

2.2 NATIONAL ENVIRONMENTAL MANAGEMENT: BIODIVERSITY ACT (ACT NO 10 OF 2004) (NEM: BA)

NEMBA was signed into law in mid-2004 and entered into effect on 1 September 2004. NEM: BA provides for the consolidation of biodiversity legislation through establishing national norms and standards for the management of biodiversity across all sectors and by different management authorities. Certain activities, known as Restricted Activities, are regulated on listed species using permits by a special set of regulations published under the Act. Restricted activities regulated under the act are keeping, moving, having in possession, importing and exporting, and selling.

2.3 THE NATIONAL BIODIVERSITY FRAMEWORK (2017-2022)

The National Biodiversity Framework (NBF) is a requirement under Section 38 of the National Environmental Management: Biodiversity Act (Act 10 of 2004, hereafter referred to as the 'Biodiversity Act'). The NBF is a short to medium-term coordination tool that shows the alignment between the strategic objectives and outcomes identified in the National Biodiversity Strategy and Action Plan (NBSAP v.2, 2015) and other key national strategies, frameworks and systems that currently guide the work of the biodiversity sector and identifies mechanisms through which this work is coordinated. It also identifies a set of interventions or "acceleration measures" that can unlock or fast-track implementation of the NBSAP and indicates the relative roles of the many agencies involved in implementing these activities. The purpose of the NBF is not to provide a comprehensive review of all work currently being undertaken in the biodiversity sector, nor to list all of the actions required to conserve and manage South Africa's biodiversity in support of sustainable development.

2.4 MPUMALANGA BIODIVERSITY CONSERVATION PLAN

The mandate for conserving biodiversity lies with state agencies at national, provincial and local levels of government, forming part of a wider responsibility for the environment and the sustainable use of natural resources. Constitutional and national laws require these environmental issues to be dealt with in cooperative, participatory, transparent and integrated ways. The MBCP is the first spatial biodiversity plan for Mpumalanga that is based on scientifically determined and quantified biodiversity objectives. The purpose of the MBCP is to contribute to sustainable development in Mpumalanga.

2.5 CONSERVATION OF AGRICULTURAL RESOURCES ACT (ACT NO 43 OF 1983) (CARA):

This act regulates the utilization and protection of wetlands, soil conservation and all matters relating thereto; control and prevention of veld fires, control of weeds and invader plants, the prevention of water pollution resulting from farming practices and losses in biodiversity.

2.6 THE NATIONAL FOREST ACT (ACT NO 84 OF 1998) (NFA)

The main objective of the National Forests Act, 1998 is to promote the sustainable management and development of forests and to provide protection for certain forests and trees. This said protection is provided through the protection of all natural forests (Section 7 (1), the protection of all trees declared to be protected in terms of section 12(1) of the Act, and the regulation of certain activities in a proclaimed State Forest (Section 23(1)(a) – (k)). It should be noted that there are other environmental legislation administered by other State Departments that also regulate natural resources. The Act is responsible for:

- Promotes the sustainable management and development of forests for the benefit of all;
- Creates the conditions necessary to restructure forestry in South Africa;
- Provide special measures for the protection of certain forests and protected trees;
- Promotes the sustainable use of forests for environmental, economic, educational, recreational, cultural, health and spiritual purposes;
- Promotes community forestry; and
- Promotes greater participation in all aspects of forestry and the forest products industry by persons disadvantaged by unfair discrimination.

2.7 CONVENTION ON BIOLOGICAL DIVERSITY

The objectives of the CBD are the conservation of biological diversity, the sustainable use of its components, and the fair and equitable sharing of the benefits arising from commercial and other utilization of genetic resources. The agreement covers all ecosystems, species, and genetic resources.

2.8 CONVENTION ON INTERNATIONAL TRADE IN ENDANGERED SPECIES OF WILD FAUNA AND FLORA (CITES)

The CITES aims to ensure that international trade in specimens of wild animals and plants does not threaten their survival. Through its three appendices, the Convention accords varying degrees of protection to more than 30,000 plant and animal species.

2.9 CONVENTION ON THE CONSERVATION OF MIGRATORY SPECIES OF WILD ANIMALS

The CMS, or the Bonn Convention aims to conserve terrestrial, marine and avian migratory species throughout their range. Parties to the CMS work together to conserve migratory species and their habitats by providing strict protection for the most endangered migratory species, by concluding regional multilateral agreements for the conservation and management of specific species or categories of species, and by undertaking co-operative research and conservation activities.

2.10 THE INTERNATIONAL TREATY ON PLANT GENETIC RESOURCES FOR FOOD AND AGRICULTURE

The objectives of the Treaty are the conservation and sustainable use of plant genetic resources for food and agriculture and the fair and equitable sharing of the benefits arising out of their use, in harmony

with the Convention on Biological Diversity, for sustainable agriculture and food security. The Treaty covers all plant genetic resources for food and agriculture, while it's Multilateral System of Access and Benefit-sharing covers a specific list of 64 crops and forages. The Treaty also includes provisions on Farmers' Rights.

2.11 CONVENTION ON WETLANDS (POPULARLY KNOWN AS THE RAMSAR CONVENTION)

The Ramsar Convention provides the framework for national action and international cooperation for the conservation and wise use of wetlands and their resources. The convention covers all aspects of wetland conservation and wise use, recognizing wetlands as ecosystems that are extremely important for biodiversity conservation in general and for the well-being of human communities.

2.12 WORLD HERITAGE CONVENTION (WHC)

The primary mission of the WHC is to identify and conserve the world's cultural and natural heritage, by drawing up a list of sites whose outstanding values should be preserved for all humanity and to ensure their protection through a closer co-operation among nations.

2.13 RAMSAR CONVENTION

The Convention on Wetlands of International Importance, called the Ramsar Convention, is an intergovernmental treaty that provides the framework for national action and international cooperation for the conservation and wise use of wetlands and their resources. The Ramsar Convention is the only global environmental treaty that deals with a particular ecosystem. The treaty was adopted in the Iranian city of Ramsar in 1971 and the Convention's member countries cover all geographic regions of the planet.

2.14 INTERNATIONAL PLANT PROTECTION CONVENTION (IPPC)

The IPPC aims to protect world plant resources, including cultivated and wild plants by preventing the introduction and spread of plant pests and promoting the appropriate measures for their control. The convention provides the mechanisms to develop the International Standards for Phytosanitary Measures (ISPMs), and to help countries to implement the ISPMs and the other obligations under the IPPC, by facilitating the national capacity development, national reporting and dispute settlement. The Secretariat of the IPPC is hosted by the Food and Agriculture Organization of the United Nations (FAO).

3. METHODOLOGY

3.1 THE ASSESSMENT

A site visit was undertaken on the **09th of July 2022 and March 2023** to assess the site-specific ecological state, current land-use, identify potential sensitive ecosystems and identify fauna and flora species associated with the proposed project activities. The site visits also served to identify potential impacts of the proposed development, and its impact on the surrounding ecological environment.

In addition to the site visit, key resources that were consulted include the following:

- South African Vegetation Map (SA VEGMAP) (Mucina et al., 2018);
- The National Freshwater Ecosystem Priority Areas (NFEPA, 2011/14);
- The National Environmental Management: Biodiversity Act (NEM:BA), 2004: List of Threatened Ecosystems (2011);
- National Biodiversity Management: Biodiversity Act (NEMBA) List of Threatened or Protected Species (2005);
- 2011 Gauteng Conservation Plan Version 3.3 (C-Plan 3.3)
- International Union for Conservation of Nature (IUCN);

3.2 SPECIES OF CONSERVATION CONCERN

Data on the known distribution and conservation status for each potential Species of Conservation Concern (SCC) has to be obtained to develop a list of 'Species of Concern'. These species are those that may be impacted significantly by the proposed activity. In general, these will be species that are already known to be threatened or at risk, or those that have restricted distributions (endemics) with a portion of their known range falling within the study area i.e. strict endemic and near endemic species. Species that are afforded special protection, notably those that are protected by NEM:BA (Act No. 10 of 2004),

3.3 SAMPLING PROTOCOL

The mining right area (Remaining Extents Of Portions 18, 21, 55, 64, 69, 85, 213 Of Farm Tenbosch 162 Ju, Portions 2, 5 And 6 Of Farm Turfbelt 593 JU And Farm Tecklenburg 548 JU) was visually surveyed to evaluate vegetation composition, and faunal assemblages and to provide detailed information on the plant communities present. The aim of the site visit was to characterise and describe each fauna and flora community within the study site as well as identify areas of high sensitivity and SCC. Prior to the site visit, sampling locations representative of each vegetation type were identified. At these sampling locations, vegetation types within the study area were assessed and surveyed using plant identification guides and other published literature. Vegetation communities were then described according to the dominant set of species recorded from each type. These were mapped and assigned a sensitivity score using the methodology outlined in Species Environmental Assessment Guideline Document.

3.4 VEGETATION MAPPING

The revised SA VEGMAP (2018) was established in order to "provide 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 SANBI Vegetation map informs finer scale bioregional plans and includes an additional 47 new vegetation units since its refinement in 2012.

The SA VEGMAP project has two main aims:

1. To determine the variation in and units of Southern African vegetation based on the analysis and synthesis of data from vegetation studies throughout the region, and
2. To compile a vegetation map. The aim of the map was to accurately reflect the distribution and variation on the vegetation and indicate the relationship of the vegetation with the environment. For this reason, the collective expertise of vegetation scientists from various universities and state departments were harnessedto make this project as comprehensive as possible

The map and accompanying book describes each vegetation type in detail, along with the most important species, including endemic species and those that are biogeographically important.

The SA VEGMAP is compared to actual conditions of vegetation observed onsite during the site assessment through mapping from aerial photographs, satellite images, literature descriptions (e.g. SANBI and ECBCP) and related data gathered on the ground.

3.5 SENSITIVITY ASSESSMENT

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 (**Table 1**). 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 1: Criteria for establishing Site Ecological importance and description of criteria.

CRITERIA	DESCRIPTION
Conservation Importance (CI)	The importance of a site for supporting biodiversity features of conservation concern present e.g. populations of IUCN Threatened and Near-Threatened species (CR, EN, VU & NT), Rare, range- restricted species, globally significant populations of congregatory species, and areas of threatened ecosystem types, through predominantly natural processes.
Functional Integrity (FI)	A measure of the ecological condition of the impact receptor as determined by its remaining intact and functional area, its connectivityto other natural areas and the degree of current persistent ecological impacts.

CRITERIA	DESCRIPTION
Biodiversity Importance (BI) is a function of Conservation Importance (CI) and the Functional Integrity (FI) of a 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 Biodiversity Importance (BI) and Receptor Resilience (RR)	

3.6 ECOLOGICAL IMPACT ASSESSMENT

3.6.1 IMPACT RATING METHODOLOGY

To ensure a balanced and objective approach to assessing the significance of potential impacts, a standardized rating scale was adopted which allows for the direct comparison of specialist studies. This rating scale has been developed in accordance with the requirements of the NEMA EIA Regulations (2014 and subsequent 2017 amendments).

The potential impacts of the proposed establishment of a mining operation, existing land uses and the available alternatives sites were rated using a clearly defined rating scale. The significance rating formula is as follows:

$$Significance = Consequence \times Probability$$

Where

$$Consequence = Type\ of\ Impact \times (Intensity + Spatial\ Scale + Duration)$$

And

$$Probability = Likelihood\ of\ an\ Impact\ Occurring$$

In addition, the formula for calculating consequence:

$$Type\ of\ Impact = +1\ (Positive\ Impact)\ or\ -1\ (Negative\ Impact)$$

The weight assigned to the various parameters for positive and impacts to biodiversity is provided for in the formula and is presented in Table 2. The probability consequence matrix is displayed in Table 3, with the impact significance rating described in Table 4.

Table 2: Biodiversity Impact Assessment Parameter Ratings

RATING	INTENSITY		SPATIAL SCALE	DURATION	PROBABILITY
	Negative Impacts (Type of Impact = -1)	**Positive Impacts (Type of Impact = +1)**			
7	Very significant impact on the environment. Irreparable damage to highly valued species, habitat or ecosystem. Persistent severe damage. Irreparable damage to highly valued items of great cultural significance or complete breakdown of social order.	Noticeable, on-going social and environmental benefits which have improved the livelihoods and living standards of the local community in general and the environmental features.	International The effect will occur across international borders.	Permanent: No Mitigation The impact will remain long after the life of the Project.	Certain/ Definite. There are sound scientific reasons to expect that the impact will definitely occur.
6	Significant impact on highly valued species, habitat or ecosystem. Irreparable damage to highly valued items of cultural significance or breakdown of social order.	Great improvement to livelihoods and living standards of a large percentage of population, as well as significant increase in the quality of the receiving environment.	National Will affect the entire country.	Beyond Project Life The impact will remain for some time after the life of a Project.	Almost certain/Highly probable It is most likely that the impact will occur.
5	Very serious, long-term environmental impairment of ecosystem function that may take several years to rehabilitate. Very serious widespread social impacts. Irreparable damage to highly valued items.	On-going and widespread positive benefits to local communities, which improves livelihoods, as well as a positive improvement to the receiving environment.	Province/ Region Will affect the entire province or region.	Project Life The impact will cease after the operational life span of the project	Likely The impact may occur.
4	Serious medium-term environmental effects. Environmental damage can be reversed in less than a year.	Average to intense social benefits to some people. Average to intense environmental enhancements.	Municipal Area Will affect the whole municipal area.	Long term 6-15 years.	Probable Has occurred here or elsewhere and could therefore occur.

	On-going serious social issues. Significant damage to structures / items of cultural significance.				
3	Moderate, short-term effects but not affecting ecosystem function. Rehabilitation requires intervention of external specialists and can be done in less than a month. On-going social issues. Damage to items of cultural significance.	Average, on-going positive benefits, not widespread but felt by some.	Local Extending across the site and to nearby settlements.	Medium term 1-5 years.	Unlikely Has not happened yet but could happen once in the lifetime of the Project, therefore there is a possibility that the impact will occur.
2	Minor effects on biological or physical environment. Environmental damage can be rehabilitated internally with/ without help of external consultants. Minor medium-term social impacts on local population. Mostly repairable. Cultural functions and processes not affected.	Low positive impacts experience by very few of population.	Limited Limited to the site and its immediate surroundings.	Short term Less than 1 year.	Rare/ improbable Conceivable, but only in extreme circumstances and/ or has not happened during lifetime of the Project but has happened elsewhere. The possibility of the impact materialising is very low as a result of design, historic experience or implementation of adequate mitigation measures.
1	Limited damage to minimal area of low significance that will have no impact on the environment. Minimal social impacts, low-level repairable damage to commonplace structures.	Some low-level social and environmental benefits felt by very few of the population.	Very limited Limited to specific isolated parts of the site.	Immediate Less than 1 month.	Highly unlikely/None Expected never to happen.

Table 3: Probability Consequence Matrix

	Significance																																											
Probability	7	-147	-140	-133	-126	-119	-112	-105	-98	-91	-84	-77	-70	-63	-56	-49	-42	-35	-28	-21	21	28	35	42	49	56	63	70	77	84	91	98	105	112	119	126	133	140	147
	6	-126	-120	-114	-108	-102	-96	-90	-84	-78	-72	-66	-60	-54	-48	-42	-36	-30	-24	-18	18	24	30	36	42	48	54	60	66	72	78	84	90	96	102	108	114	120	126
	5	-105	-100	-95	-90	-85	-80	-75	-70	-65	-60	-55	-50	-45	-40	-35	-30	-25	-20	-15	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	105
	4	-84	-80	-76	-72	-68	-64	-60	-56	-52	-48	-44	-40	-36	-32	-28	-24	-20	-16	-12	12	16	20	24	28	32	36	40	44	48	52	56	60	64	68	72	76	80	84
	3	-63	-60	-57	-54	-51	-48	-45	-42	-39	-36	-33	-30	-27	-24	-21	-18	-15	-12	-9	9	12	15	18	21	24	27	30	33	36	39	42	45	48	51	54	57	60	63
	2	-42	-40	-38	-36	-34	-32	-30	-28	-26	-24	-22	-20	-18	-16	-14	-12	-10	-8	-6	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42
	1	-21	-20	-19	-18	-17	-16	-15	-14	-13	-12	-11	-10	-9	-8	-7	-6	-5	-4	-3	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
		-21	-20	-19	-18	-17	-16	-15	-14	-13	-12	-11	-10	-9	-8	-7	-6	-5	-4	-3	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
	Consequence																																											

Table 4: Significance Threshold Limits

Score	Description	Rating
109 to 147	A very beneficial impact which may be sufficient by itself to justify implementation of the project. The impact may result in permanent positive change.	
73 to 108	A beneficial impact which may help to justify the implementation of the project. These impacts would be considered by society as constituting a major and usually a long-term positive change to the (natural and/or social) environment.	
36 to 72	An important positive impact. The impact is insufficient by itself to justify the implementation of the project. These impacts will usually result in positive medium to long-term effect on the social and/or natural environment.	
3 to 35	A small positive impact. The impact will result in medium to short term effects on the social and/or natural environment.	
-3 to -35	An acceptable negative impact for which mitigation is desirable but not essential. The impact by itself is insufficient even in combination with other low impacts to prevent the development being approved. These impacts will result in negative medium to short term effects on the social and/or natural environment.	
-36 to -72	An important negative impact which requires mitigation. The impact is insufficient by itself to prevent the implementation of the Project but which in conjunction with other impacts may prevent its implementation. These impacts will usually result in negative medium to long-term effect on the social and/or natural environment.	
-73 to -108	A serious negative impact which may prevent the implementation of the project. These impacts would be considered by society as constituting a major and usually a long-term change to the (natural and/or social) environment and result in severe effects.	
-109 to -147	A very serious negative impact which may be sufficient by itself to prevent implementation of the project. The impact may result in permanent change. Very often these impacts are immitigable and usually result in very severe effects.	

4. SITE CHARACTERISTICS

4.1 DESCRIPTION OF THE BIOPHYSICAL ENVIRONMENT

4.1.1 GEOLOGY & SOILS

The site is characterized by Karoo Supergroup shale and lesser sandstone layers are punctuated by sheets and dykes of Jurassic dolerite. Soils (Sterkspruit, Swartland and Estcourt soil forms) are rich in sodium and very susceptible to erosion. Land types include Dc and Ea.

4.1.2 CLIMATE

The site is characterized by Summer rainfall with dry winters. The Mean Annual Precipitation (MAP) about 450–850 mm. Generally a frost-free region. See also climate diagram for SVI 4 Delagoa Lowveld.In addition the mining right area, consists of the Letaba Formation basalts of the Karoo Supergroup in this area give rise to black, brown or red clayey soils, usually not more the 1 m deep. Vertisols, such as the Arcadia soil form, occur in low-lying areas and concave plains. Land types mainly Ea with some Dc.

4.1.3 VEGETATION FOUND ON THE MINING RIGHT AREA

According to the SANBIGIS database the shaft site consists of the SVI 4 Delagoa Lowveld vegetation type. This vegetation is characterized Dense tree or tall shrub layer dominated by *Acacia welwitschii*, often forming thickets. Herb layer has in addition to grass species a wide variety of forbs. Areas are often heavily grazed which sometimes drastically reduces the grass cover (Mucina and Rutherford.,2006) The entire properties consist of a number of including the Deloga Lowveld, Tshokwane-Hlane Basalt Lowveld, Granite Lowveld and the Kaalrug Mountain Bushveld vegetation units (**Figure 3**).

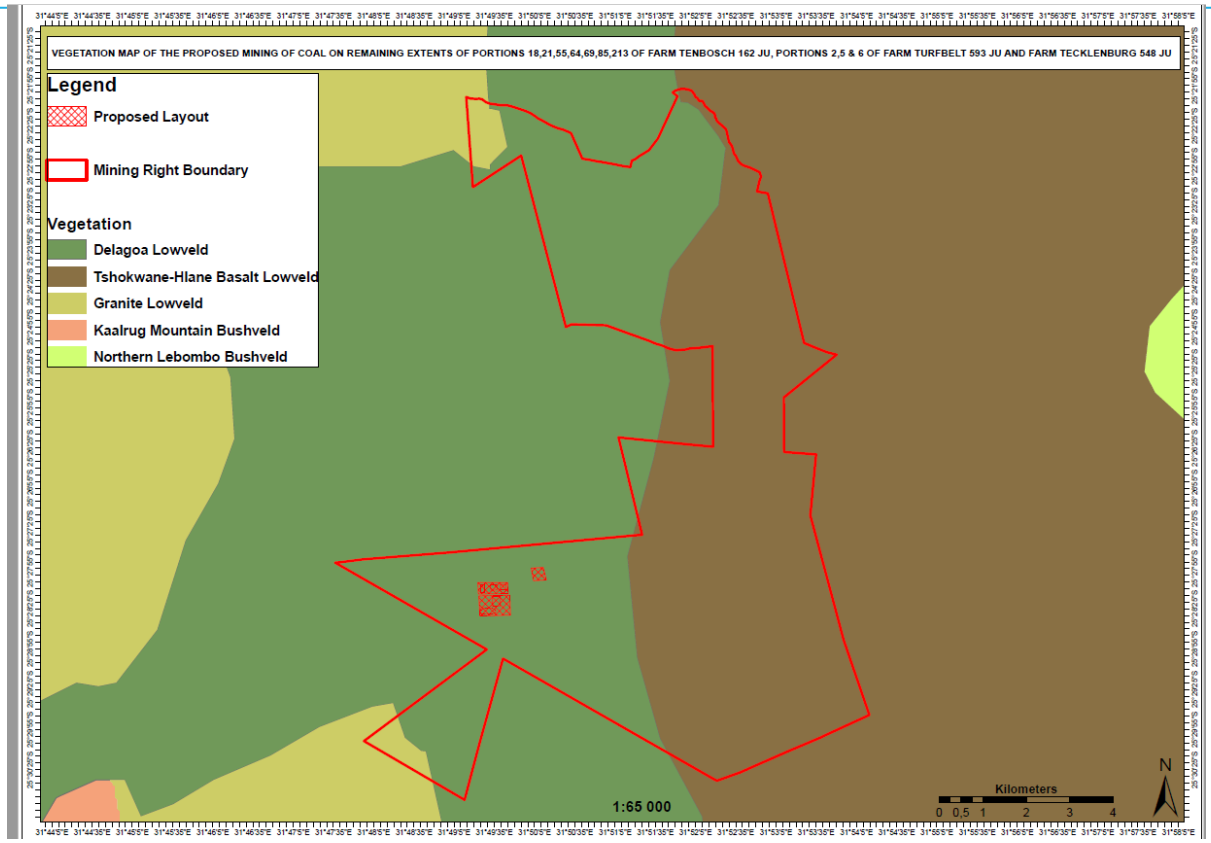


Figure 3: The vegetation type associated with the On The Remaining Extents Of Portions 18, 21, 55, 64, 69, 85, 213 Of Farm Tenbosch 162 JU, Portions 2, 5 And 6 Of Farm Turfbelt 593 JU And Farm Tecklenburg 548 JU

The SVI 4 Delagoa Lowveld is distributed across the Mpumalanga Province, Swaziland and marginally into KwaZulu-Natal Province: A narrow strip on plains immediately east of the SVI 3 Granite Lowveld from the Nsemani River west of Satara in the Kruger National Park southwards to immediately west of Lower Sabie Camp to the Pomba Guard Post west of Crocodile Bridge Camp to the Strydom Block in the south. Also a band in Swaziland from Mhlume in the north to Onverwacht Border Post in the south, extending marginally into KwaZulu-Natal at Pongola. Altitude 150–450 m.

Table 5: Important Taxa within the SVI 4 Delagoa Lowveld (Mucina and Rutherford 2006)

PLANT FORM	SPECIES
Small Trees	*Acacia senegal var. rostrata (d), A. welwitschii subsp. delagoensis (d), Albizia petersiana (d), Schotia capitata (d), Spirostachys africana (d), Pappea capensis.*
Tall Shrubs	*Euclea divinorum (d), Maerua parvifolia (d), Boscia mossambicensis, Dichrostachys cinerea, Ehretia rigida subsp. rigida, Flueggea virosa, Grewia bicolor, Rhus gueinzii.*
Low Shrubs	*Abutilon austro-africanum, Justicia flava, Zanthoxylum humile.*
Woody Climbers	*Cordia ovalis (d), Capparis tomentosa*
Graminoids	*Chloris virgata (d), Panicum coloratum (d), P. maximum (d), Sporobolus nitens (d), Aristida congesta, Chloris roxburghiana, Dactyloctenium aegyptium, Tragus berteronianus.*
Herbs:	*Blepharis integrifolia, Kyphocarpa angustifolia, Ruellia patula.*
Succulent Herb	*Aloe parvibracteata.*

4.1.4 VEGETATION UNIT-SVL 5 TSHOKWANE-HLANE BASALT LOWVELD

According to the SANBIGIS database the mining right area also consists of the SVl 5 Tshokwane-Hlane Basalt Lowveld vegetation type. This vegetation type is characterized by fairly flat plains with open tree savanna, often dominated by tall *Sclerocarya birrea* and *Acacia nigrescens* with a moderately developed shrub layer and a dense herbaceous layer. On some sloping areas with shallower soils, trees are stunted (e.g. *A. nigrescens*).

The SVl 5 Tshokwane-Hlane Basalt Lowveld vegetation type is distributed in the Mpumalanga Province and Swaziland (and very slightly into Limpopo Province). It is usually found On plains immediately west of the Lebombo Mountains from Balule and Satara Camps in Kruger National Park in the north, through Tshokwane, Lower Sabie and Crocodile Bridge Camps, Komatipoort to around Ngwenyeni in the south. In Swaziland it occurs from Vuvulane Settlement in the north, through Hlane Game Sanctuary to a point in the south approximately halfway between Siteki and Big Bend. Altitude 180–400 m[1].

Table 6: Important Taxa within the SVl 5 Tshokwane-Hlane Basalt Lowveld (Mucina and Rutherford 2006)

PLANT FORM	SPECIES
Tall Trees	*Acacia nigrescens (d), Sclerocarya birrea subsp. caffra (d), Philenoptera violacea*
Small Trees	*Acacia borleae, A. gerrardii, A. nilotica, A. tortilis subsp. heteracantha, Albizia harveyi, Combretum hereroense, C. imberbe, Lannea schweinfurthii var. stuhlmannii, Peltophorum africanum, Pterocarpus rotundifolius*
Tall Shrubs:	*Dichrostachys cinerea, Grewia bicolor, Gymnosporia maranguensis, Rhus gueinzii.*
Low Shrubs:	*Acalypha segetalis, Dicoma tomentosa, Hermannia glanduligera, Justicia flava, J. protracta subsp. protracta, Seddera suffruticosa, Tragia dioica.*
Herbaceous Climber	*Commicarpus plumbagineus*
Graminoids	*Bothriochloa radicans (d), Digitaria eriantha subsp. eriantha (d), Panicum coloratum (d), P. maximum (d), Themeda triandra (d), Urochloa mosambicensis (d), Aristida congesta, Cenchrus ciliaris, Eragrostis superba, Heteropogon contortus.*
Herbs:	*Chamaecrista mimosoides, Gisekia africana, Thunbergia dregeana*
Succulent Herbs:	*Aloe zebrina, Orbea paradoxa, O. rogersii.*

4.1.5 VEGETATION TYPES RECORDED ON SITE

While National level vegetation maps have described broad vegetation types, local conditions, and micro-habitats (rainfall, soil structure, rocky outcrops, etc.) can result in variations in plant composition. As such, site surveys are critical for the verification of desktop findings and establishing the baseline ecological conditions of a site. The site visit conducted from the on the 09th of July 2022 confirmed that the vegetation of the project area is SVl 4 Delagoa Lowveld (Figure 4-5). A full list of the species associated with the mine shaft area is listed on Appendix 1.

[1] Remarks Different parts of this unit can show different rates of change over years, including some parts with very little change (Coetzee et al. 1977). Mapped as part of this unit is the small area (3% of the unit) east of Kumana waterhole, south of Satara (Kumana Sandveld of Gertenbach 1983b), which is on sandstone, but contains dolerite intrusions with clayey soil as well as some surface shales with sodium-saturated soil.

Figure 4: Vegetation observed within the Farm Tecklenburg 548 JU where the shaft and associated infrastructure will be located. The site consist of the SVl 4 Delagoa Lowveld.

Figure 5: Dense tree or tall shrub layer dominated by *Acacia welwitschii*, often forming thickets. Herb layer has in addition to grass species a wide variety of forbs.

4.1.6 CONSERVATION OF THE VEGETATION UNITS ONSITE

SVL 4 DELAGOA LOWVELD

The SVL 4 Delagoa Lowveld is classified as **Vulnerable**. A target of 19% has been set as a conservation target. About 18% statutorily conserved in the Kruger National Park. Some 33% transformed, almost all by cultivation.

SVL 5 TSHOKWANE-HLANE BASALT LOWVELD

The SVI 5 Tshokwane-Hlane Basalt Lowveld is classified as **Least threatened**, About 64% statutorily conserved mainly in the Kruger National Park, but also in the Mlawula Nature Reserve. In addition, over 3% conserved mainly in the Hlane Game Sanctuary. About 17% transformed, almost all by cultivation.

4.1.7 FLORA SPECIES OF SPECIAL CONCERN

South Africa has become the first country to fully assess the status of its entire flora (Domitilla and Raimondo, 2011). Major threats to the South African flora are identified in terms of the number of plant taxa Red-Listed as threatened with extinction as a result of threats like, habitat loss (e.g. infrastructure development, urban expansion, crop cultivation and mines), invasive alien plant infestation (e.g. outcompeting indigenous plant species), habitat degradation (e.g. overgrazing, inappropriate fire management etc.), unsustainable harvesting, demographic factors, pollution, loss of pollinators or dispersers, climate change and natural disasters (e.g. such as droughts and floods)[2]. South Africa uses the internationally endorsed IUCN Red List Categories and Criteria in the Red List of South African plants. However, due to its strong focus on determining risk of extinction, the IUCN system does not highlight species that are at low risk of extinction but may nonetheless be of high conservation importance. As a result, SANBI uses an amended system of categories in order to highlight species that may be of low risk of extinction but are still of conservation concern (SANBI, 2015).

In the Mpumalanga Province, species of conservation concern are also protected in terms of national and provincial legislation, namely:

- **Mpumalanga Nature Conservation Act No. 10 of 1998**: To consolidate and amend the laws relating to nature conservation within the Province and to provide for matters connected therewith..

The following species protected in terms of the Mpumalanga Nature Conservation Act No. 10 of 1998 are known to be found in the area (**Tables 7-8**).

Table 7: Protected Plants (Section 69 (1) (a), Schedule 11[3].

COMMON NAME	SCIENTIFIC NAME
All Species Of Tree Ferns, Excluding The Bracken Fern	All Species Of The Genus: *Cyathea Capensis* And *CyatheaDregei*
All Species Of Cycads In Republic Of South Africa And TheSeedlings Of The Species Of Cycads Referred To In Schedule 12	All Species Of The Family Zamiaceae Occurring In The Republic Of South Africa And The Seedlings Of The Species Of Encephalartos Referred To In Schedule 12
All Species Of Yellow Wood	*Podocarpus* Spp.
All Species Of Arum Lilies	*Zantedeschia* Spp.
"Volstruiskos"	*Schizobasis Intricata*

[3] In this Schedule-
(a) the plants referred to shall not include plants which have been improved by selection or crossbreeding
(b) "seedling" means a plant of which the diameter of the trunk or bulb, either above or below the ground, does not exceed 150 mm.

"Knolklimop"	*Bowiea Volubilis*
All Species Of Red-Hot Pokers	*Kniphofia* Spp.
All Species Of Aloes, Excluding:	*Aloe* Spp., Excluding:
(A) All Species Not Occurring In Mpumalanga And	(A) All Species Not Occurring In Mpumalanga And
(B) The Following Species:	(B) The Following Species:
All Species Of Haworthias	*Haworthia* Spp.
All Species Of Agapanthus	*Agapanthus* Spp.
All Species Of Squill	*Scilla* Spp.
All Species Of Pineapple Flower	*Eucomis* Spp.
All Species Of Dracaena	*Dracaena* Spp.
All Species Of Paint Brush	*Haemanthus* Spp. And *Scadoxis* Spp.
Cape Poison Bulb	*Boophane Disticha*
All Species Of Clivia	*Clivia* Spp.
All Species Of Brunsvigia	Brunsvigia Spp.
All Species Of Crinum	*Crinum* Spp
Ground Lily	*Ammocharis Coranica*
All Species Of Fire Lily	*Cyrtanthus* Spp.
All Species Of Elephantsfoot	*Dioscorea* Spp.
River Lily	*Hesperantha Coccinea*
All Species Of Gladioli	*Gladiolus* Spp.
All Species Of Watsonia	*Watsonia* Spp.
Wild Ginger	*Siphonochilus Aethiopicus*
All Species Of Orchids	All Species Of The Family Orchidacaea
All Species Of The Family Proteaceae	All Species Of The Family Proteacea
All Species Of Black Stinkwood	Ocotea Spp.
Kiaat	*Pterocarpus Angolensis*
Tamboti	*Spirostachys Africana*
The Following Species Of Euphorbias: Euphorbia Bernardii And Euphorbia Grandialata	The Following Species Of Euphorbias: *Euphorbia Bernardii* And *Euphorbia Grandialata*
Common Bersama	*Bersama Tysoniana*
Red Ivory	*Berchemia Zeyheri*
Pepperbark Tree	*Warburgia Salutaris*
All Species Of Adenia	Adenia Spp.
Bastard Onion Wood	*Cassipourea Gerrardii*
Assegai Tree	Curtisia Dentata
All Species Of Olive Trees	All Species Of The Genus Olea
All Species Of Impala Lilies	All Species Of The Genus Adenium
Kudu Lily	*Pachypodium Saundersii*
All Species Of Brachystelma	*Brachystelma* Spp.
All Species Of Ceropegia	*Ceropegia* Spp.
All Species Of Huerniopsis And Huernia	*Huerniopsis* And *Huernia* Spp.
All Species Of Duvalia	Duvalia Spp.
All Species Of Stapeliads	*Stapelia* Spp.
All Species Of Orbeanthus	*Orbeanthus* Spp.
All Species Of Orbeas	Orbea Spp.
All Species Of Orbeopsis	Orbeopsis Spp.

Table 8: Specifically Protected Plants (Section 69 (1) (b), Schedule 12[4].

Common name	Scientific name
(a) all plants, excluding seedlings, of the following species of cycads: *dolomiticus, dyer, middelburg, eugene marais, heenan, inopinus, laevifolius, lanatus,*	(a) all plants, excluding seedlings, of the following species of the Genus *Encephalartos*: *E. dolomiticus, E. dyerianus, E. middelburgensis, E. eugene maraissii, E.*

[4] In this Schedule-
(a) the plants referred to shall not include plants which have been improved by selection or crossbreeding
(b) "seedling" means a plant of which the diameter of the trunk or bulb, either above or below the ground, does not exceed 150 mm.

lebombo, ngoyanus, paucidentatus, modjadje and villosus	*heenanii, E. inopinus, E. laevifolius, E. lanatus, E. lebomboensis, E. ngoyanus, E. paucidentatus, E. transvenosus and E. villosus* and any species derived from the above species
(b) all plants of the following. species of cycads: *cupidus* and *humilus*	(b) all plants of the following species of the Genus Encephalartos: *E. cupidus* and *E. humilus*
(c) all species of cycads in their natural habitat.	(c) all plants of the Genus Encephalartos in their natural habitat

4.1.8 SPECIES OF SPECIAL CONCERN ONBERVED ONSITE SITE

Figure 6: Sclerocarya birrea (Marula Tree) observed on the Farm Tecklenburg range 548 JU

Figure 7: Combretum imberbe (Leadwood) observed on the Farm Tecklenburg range 548 JU

4.1.9 ETHNOBOTANICAL PLANT SPECIES

Ethnobotany/ Ethnoecology is a branch of botany that focuses on the use of plants for medicines, cultural and recreational purposes. The overexploitation of indigenous plants for ethnobotanical purposes can be detrimental to populations of those particular plant species, and the other species that depend on its existence for their survival.

South Africa has a rich diversity of medicinal plants that not only have a global significance, but also have a cultural and historical role (van Wyk *et al*. 2009). There is a rapidly growing concern for conservation of medicinal plants that are dwindling in number due to illegal harvesting (Institute of Natural Resources 2003). This is particularly apparent in rural areas where medicinal plants are overexploited by traditional doctors (Mazid *et al.,* 2012). Aloe's species were found within the study site. The bitter sap in the leaves of *Aloe greatheadii* is used medicinally for the treatment of wounds, sores and burns while *Aloe marlothi* Leaf and root decoctions are used by the Zulus for roundworm infestations and by other cultures for stomach problems and horse sickness. The study site has an

abundance of Aloe species (Figure 8).

Figure 8: Dominant Aloe Specie observed onsite.

4.1.10 ALIEN INVASIVE SPECIES PRESENT ON SITE

An "invasive species" is any species whose establishment and spread outside of its natural distribution range (i) threatens ecosystems, habitats or other species or has a demonstrable potential to threaten ecosystems, habitats or other species; and (ii) may result in economic or environmental harm or harm to human health. Invasive alien plant species are globally considered as one of the greatest threats to the environment, biodiversity, ecosystem integrity and the economy.

According to the Conservation of Agricultural Resources Act (No. 43 of 1983 - Regulation 15, 30 March 2001) (CARA), for agricultural land, and the National Environmental Management: Biodiversity Act (No. 10 of 2004) (NEMBA), for natural areas, invasive alien plant species should be controlled and eradicated with an emphasis on urgent action in biodiversity priority areas. NEMBA published a list of Alien and Invasive Species (No 599) in 2014 which regulates the management of alien and invasive plants in natural environments.

A number of alien invasive species were observed within close proximity of the mining right area, the majority of the alien invasive species were observed along the banks of the Komati River and the Ngwedi River (**Figures 9-11**). A list of all the alien invasive species that are listed under the Mpumalanga Nature Conservation Act No. 10 Of 1998 are **listed in Appendix 2**.

Figure 9: Ricinus communis onbserved along the Komati River.

Figure 10:*Senna didymobotrya* (Peanut Butter Cassia) Observed within proximity of the study site (Closer to the Komati River)

Figure 11:Cluster of alien invasive species consisting of Castor Oil plant and morning glory.

The above illustrated alien invasive plant species were observed outside of the proposed mining area, it important to pay close attention to them and other invader weeds and Plants as outlined on schedule 13 of the Mpumalanga Nature Conservation Act No. 10 of 1998 during, construction and operation of the mine.

4.1.11 2014 Mpumalanga Biodiversity Sector Plan

According to the Mpumalanga Biodiversity Sector Plan, The proposed mining right area traverses through an Ecological Support Area (ESA) (**Figures 12-13**). Ecological Support Areas are not essential for meeting biodiversity targets but play an important role in supporting the ecological functioning of Critical Biodiversity Areas and/or in delivering ecosystem services. Critical Biodiversity Areas and Ecological Support Areas may be terrestrial or aquatic. Critical Biodiversity Areas are areas required to meet biodiversity targets for ecosystems, species and ecological processes, as identified in a systematic biodiversity plan. The overall mining right area is located within close proximity to the protected areas (Figure 12). The Farm Tecklenburg 548 JU is classified as natural (**Figure 13**).

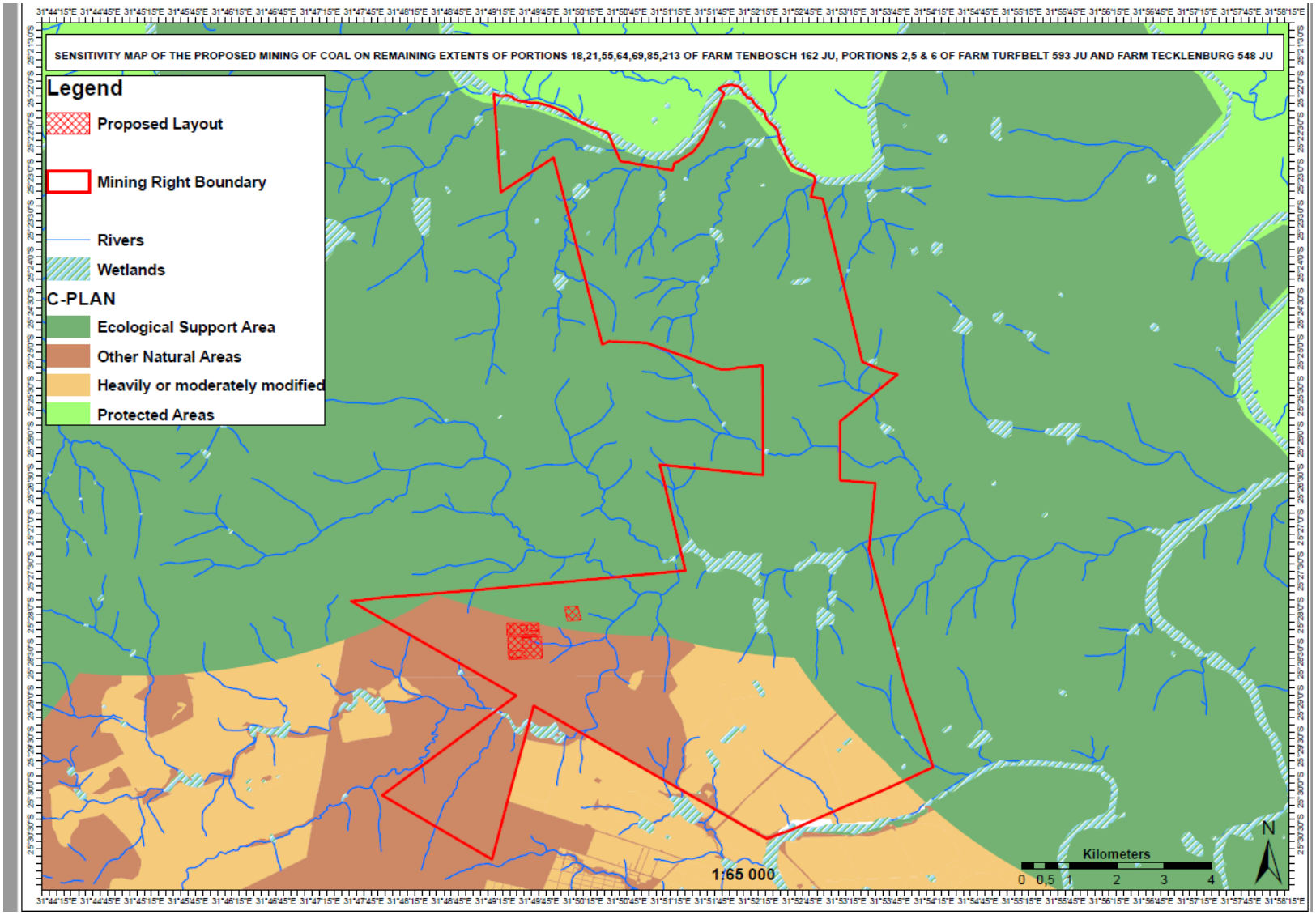


Figure 12: Mining Right boundary in relation to the 2014 Mpumalanga Biodiversity Sector Plan

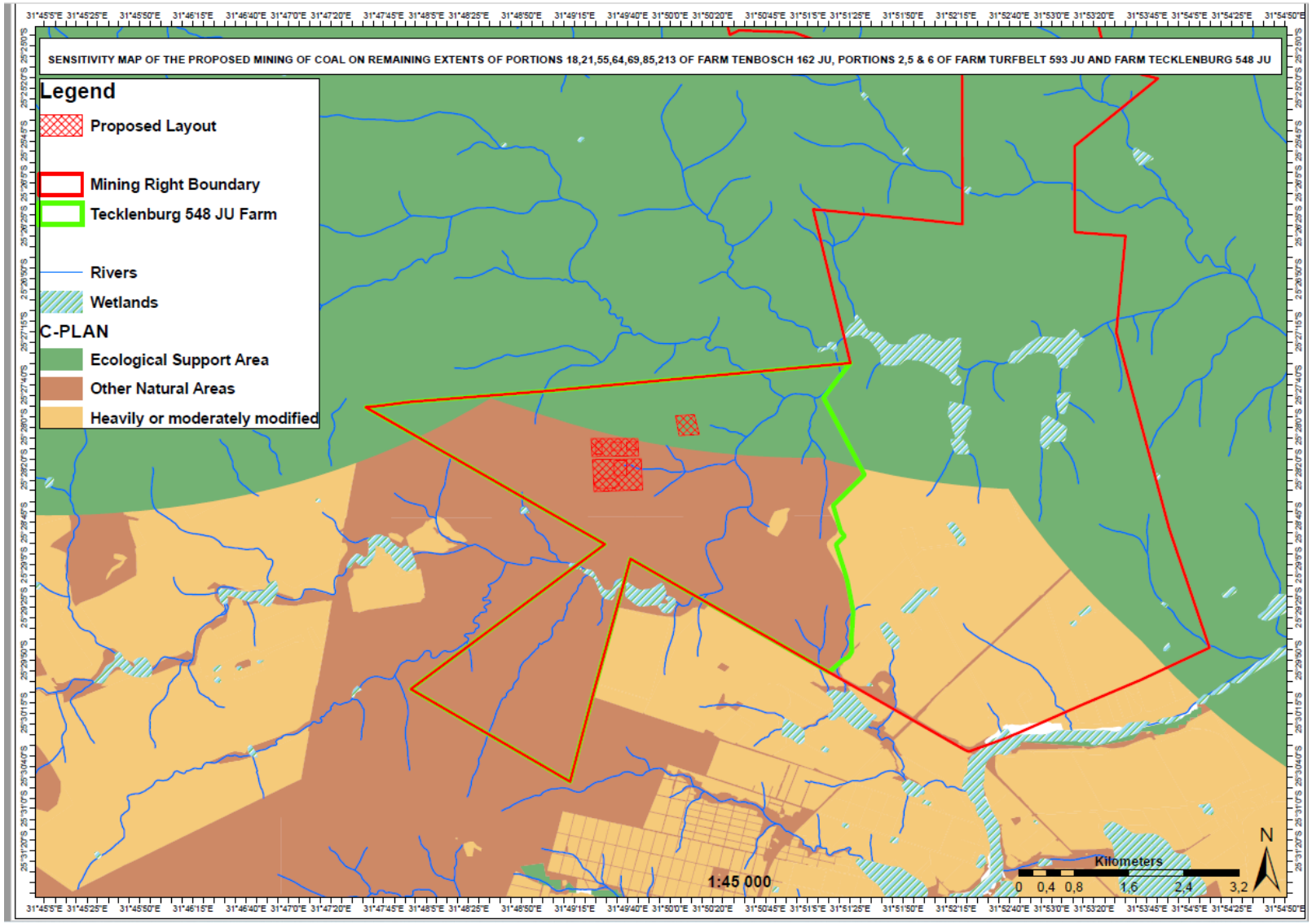


Figure 13: Farm Tecklenburg 548 JU in relation to the 2014 Mpumalanga Biodiversity Sector Plan

4.2 WATERCOURSES ON SITE

The aquatic sensitivity of the proposed site is classified as **VERY HIGH** in the Screening Report. The National Freshwater Ecosystems Priority Areas (NFEPA) identifies important wetlands in South Africa5 (Figure 9), the study site falls under the Inkomati Water Management Area (WMA). The site is located within 500m of a number of watercourses refer to Figure 12- 13 above.

4.3 DESCRIPTION OF FAUNA

The IUCN Red List Spatial Data (IUCN, 2017) lists 81 mammal species that could be expected to occur within the project area. Of these species, 9 are medium to large conservation dependant species, such Tragelaphus oryx (Common Eland) that, in South Africa, is generally restricted to protected areas such as game reserves. These species are not expected to occur in the project area and are removed from the expected SCC list. They are however still included (common name in red). Of the remaining 72 small to medium sized mammal species, fourteen (14) (19.4%) are listed as being of conservation concern on a regional or global basis (Table 9).

Table 9: List of mammal species of conservation concern that may occur in the project area as well as their global and regional conservation statuses (IUCN, 2017; SANBI, 2016)

AMPHIBIANS, REPTILES AND MAMMALS	
COMMON NAME	**SCIENTIFIC NAME**
Bullfrog	***Pyxicephalus Adspersus***
All Species Of Reptiles Excluding The Water Leguan, RockLeguan And All Species Of Snakes	***All Species Of The Class Reptilia Excluding Varanus Niloticus, Varanus Exanthematicus And All Species Of TheSub Order Serpentes***
Riverine Rabbit	***Bungolagus Monticularis***
Hedgehog	***Atelerix Frontalis***
Samango Monkey	***Cercophithecus Mitis***
Bushbaby	***Otolemur Crassicaudatus***
Lesser Bushbaby	***Galago Moholi***
Honey-Badger	***Mellivora Capensis***
Pangolin	***Manis Temminckii***
Aardwolf	***Proteles Cristatus***
CAPE HUNTING DOG	***LYCAON PICTUS***
Brown Hyaena	***Hyaena Brunnea***
Antbear	***Orycteropus Afer***
Mountain Zebra	***Equus Zebra Zebra***
Hartmann's Zebra	***Equus Zebra Hartmannae***
Hippopotamus	***Hippopotamus Amphibius***
Giraffe	***Giraffa Camelopardalis***
Nyala	***Tragelaphus Angasi***
Red Duiker	***Cephalophus Natalensis***
Blue Duiker	***Philantomba Monticola***
Reedbuck	***Redunca Arundinum***
Mountain Reedbuck	***Redunca Fulvorufula***
Sable Antelope	***Hippotragus Niger***

[5] SANBI (2009). Further Development of a Proposed National Wetland Classification System for South Africa. Primary Project Report. Prepared by the Freshwater Consulting Group (FCG) for the South African National Biodiversity Institute (SANBI).

4.3.1 FIELD INVESTIGATION FINDINGS

During the site visit, no mammals were observed along the proposed mining area, except for the droppings of livestock (Figure 14).

Figure 14:Dropping sof cattle observed onsite.

4.4 HERPETOFAUNA (REPTILES & AMPHIBIANS)

Based on the IUCN Red List Spatial Data (IUCN, 2017) and the Reptile Map database provided by the Animal Demography Unit (ADU, 2017) 20 reptile species are expected to occur in the project area. No species of conservation concern should be present according to the above-mentioned sources within the project area but in situ observations may prove otherwise.

Based on the IUCN Red List Spatial Data (IUCN, 2017) and the Amphibian Map database provided by the Animal Demography Unit (ADU, 2017) 20 amphibian species are expected to occur in the project area. Of the expected amphibian species, 1 namely *Pyxicephalus adspersus* (Giant Bull Frog) is listed on a regional scale as Near Threatened (NT).

Recorded reptile diversity is moderately rich overall, with 46 species in the area (Bates et al. 2014). Most species are fairly widespread in western South Africa; however, some are restricted to the mountains that follow the Gariep River. Rocky and mountainous areas and open plains support reptile faunas that are somewhat distinct from each other. Seven endemic or near-endemic species are present within the study area, Speckled Padloper *Homopus signatus*, Striped Pygmy Gecko *Goggia lineatus*, Good's Gecko *Pachydactylus goodi*, Sand Lizard *Pedioplanis laticeps*, Southern Karusa Lizard

Karusasaurus polyzonus, Namaqua Dwarf Burrowing Skink *Acontias tristis*, and Spotted Rock Snake *Lamprophis guttatus*.

4.4.1 FIELD INVESTIGATION FINDINGS

None of the expected reptiles were observed on site during the site visit.

4.5 AVIFUANA

Birds are generally regarded as good ecological indicators, because their presence or absence tends to represent conditions pertaining to the proper functioning of an ecosystem. Bird communities and ecological conditions are directly linked to land cover. As the land cover of an area changes, so do the types of birds in that area (The Bird Community Index, 2007). Land cover is directly linked to habitats within the study area. The diversity of these habitats should give rise to many different species. It is important to note that the study site is classified as an important Bird Area. Important Bird and Biodiversity Areas (IBAs), as defined by BirdLife International, constitute a global network of over 13 500 sites, of which 112 sites are found in South Africa. IBAs are sites of global significance for bird conservation, identified nationally through multi-stakeholder processes using globally standardised, quantitative and scientifically agreed criteria. Essentially, these are the most important sites for conserving.

According to the South African Bird Atlas Project (SABAP2), almost 300 species of birds have been identified in the Manyeleti area. All birds that could be present within the vicinity of the study site are listed in Table 10.

Table 10: Avifaunal species that maybe observed onsite.

Scientific Name	Common Name	IUCN Status
Geronticus calvus	Southern Bald Ibis	VU
Sagittarius serpentarius	Secretary bird	NT
Gyps coprotheres	Cape Vulture	VU
Stephanoaetus coronatus	African Crowned Eagle	NT
Circus ranivorus	African Marsh-Harrier	VU
Circus maurus	Black Harrier	NT
Falco biarmicus	Lanner Falcon	LC
Alcedo semitorquata	Half Collared Kingfisher	CR
Bugeranus carunculatus	Wattled Crane	VU
Anthropoides paradiseus	Blue Crane	VU
Balearica regulorum	Grey Crowned Crane	VU
Eupodotis senegalensis	White-bellied Korhaan	VU

4.5.1 FIELD INVESTIGATION FINDINGS

A few avifaunal species were spotted onsite during the site visit. A desktop assessment was conducted to survey the site in relation to the important Bird Areas. The site is not located within the Important Bird Areas. According to Birdlife South Africa, the mining right boundary falls outside of and are not near any Important Bird Areas (IBA), which have been identified within South Africa[6]. All of the avifaunal

[6] www.birdlife.org.za

species observed within the area are considered to be of Least Concern by the IUCN and are common and widespread species.

4.6 INVERTEBRATES

Butterflies are a good indication of the habitats available in a specific region (Woodhall 2005). Although many species are eurytropes (able to use a wide range of habitats) and are widespread and common, South Africa has many stenotrope or endemic species (specific habitat requirements with populations concentrated in a small area) which may be very specialised (Woodhall 2005). Butterflies are useful indicators as they are relatively easy to locate and catch, and therefore identify.

4.6.1 FIELD INVESTIGATION FINDINGS

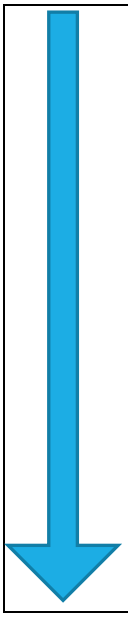
A limited number of butterflies were observed during the site visit . The of butterflies may be attributed to seasonality constraints. The site had a number of spider webs which is an indication of the presence of archanids.

Figure 15:Evidence of presence of arachnids onsite.

5. IMPACT ASSESSMENT

The impact assessment is aimed predicting potential impacts of the proposed project. Impact assessment strives to avoid damage, loss of ecosystems services, and where they cannot be avoided, to reduce and mitigate these impacts (DEA, 2013). Offsets to compensate for loss of habitat are regarded as a last resort, after all efforts have been made to avoid, reduce and mitigate. The mitigation hierarchy is represented in Table 11.

Table 11: Mitigation hierarchy of impacts

	**Avoid or prevent**	Refers to considering options in project location, sitting, scale, layout, technology and phasing to avoid impacts on biodiversity, associated ecosystem services and people. This is the best option but is not always possible. Where environmental and social factors give rise to unacceptable negative impacts, the activity should not take place. In such cases, it is unlikely to be possible or appropriate to rely on the other steps in the mitigation.
	Minimise	Refers to considering alternatives in the project location, sitting, scale, layout, technology and phasing that would minimise impacts on biodiversity, associated ecosystem services. In cases where there are environmental constraints, every effort should be made to minimise impacts.
	Rehabilitate	Refers to rehabilitation of areas where impacts are unavoidable, and measures are provided to return impacted areas to near natural state or an agreed land use after mine closure. Rehabilitation can, however, fall short of replicating the diversity and complexity of natural systems.
	Offset	Refers to measures over and above rehabilitation to compensate for the residual negative impacts on biodiversity after every effort has been made to minimise and then rehabilitate the impacts. Biodiversity offsets can provide a mechanism to compensate for significant residual impacts on biodiversity.

A significant portion of the property with the remaining natural habitat is anticipated to be lost due to the proposed establishing of the mining activities and associated activities. The impact of the proposed activity will involve a loss of habitat for both flora and fauna.

5.1 Loss of habitat

The area falls within an Ecological Support Area (ESA), which consists of land that is considered natural with endemics and protected plant species present. As a result of this, the impacts of the proposed development and associated aspects and features, although limited in extent are regarded as highly significant. Due to disturbance of the soil and removal of vegetation, it is likely that alien plants may establish on site. The proposed development will result in a loss of general faunal habitat and ecological connectivity.

Loss of vegetation will be irreversible and although rehabilitation can be aimed at reinstating the land to some form of land-use, restoration of the natural habitat on site cannot be achieved. This is particularly significant in an area where some plant species remain undescribed. Many species in this habitat are adapted to specific soil composition and structure and the natural species composition cannot be restored after disturbance to the soil (Victor et al. 2005). The impacts attributed with the loss of habitat are listed below in the phase they occur. **The Impacts of the proposed mining activities are assessed** below.

5.2 GENERAL IMPACT ASSESSMENT

Table 12: Assessment of impacts associated with the proposed Mining Activities.

CONSTRUCTION PHASE

IMPACT 1: HABITAT LOSS

Cause and Comment

Direct Impact on the route

During the construction phase, the clearance of vegetation and associated construction activities will directly impact the terrestrial habitat resulting in possible erosion and loss of topsoil. This in turn could exacerbate the invasive alien species challenge onsite. However, if mitigation measures are implemented this impact will be of low significance.

Cumulative Impact

The site is disturbed by both commercial faming activities and harvesting of wood. However, the footprint of the proposed road is expected to place additional pressure on the habitat.

No-Go Alternative

. The current or "no-go" impacts on the habitat are therefore classified as low.

Mitigation Measures:

- ☐ An Erosion Management Plan / Method Statement should be compiled and implemented during the Construction Phase.
- ☐ Activities within 500m of a wetland must obtain the necessary Water Use Authorisation prior to the commencement of such activities.
- ☐ Vegetation clearance must be kept to a minimum and retained where possible to avoid soil erosion.
- ☐ Disturbed areas must be rehabilitated as soon as possible after construction.
- ☐ The site should be monitored regularly for signs of erosion. Remedial action must be taken at the first signs of erosion.

Significance Assessment:

Impact	Nature	Duration	Extent	Severity	Likelihood	Significance Before Mitigation	Reversibility	Irreplaceable Loss	Mitigation Potential	Significance After Mitigation
Both Layout Alternatives	Direct	Long-Term	Study-Area	Moderate	May Occur	**High (-)**	Reversible	Resource will be partly	Achievable	**Low (-)**

Cumulative	Cumulative	Long-Term	Study-Area	Slight	Possible	**Low (-)**	It is difficult to implement mitigation measures specific to the cumulative impacts as the applicant only has jurisdiction over their development and not over other developments or farming activities in the area. However, it is imperative that the applicant implement the mitigation measures listed abovefor the direct impacts.	**N/A**
No-Go	Direct	Short-Term	Localised	Moderate	Probable	**Low (-)**	**N/A**	

IMPACT 2: LOSS OF THE SVI 4 Delagoa Lowveld VEGETATION

Cause and Comment

Direct Impact on the proposed Mine

The clearing of land for the construction of the site to create a mine will result in the loss of vegetation of the SVI 4 Delagoa Lowveld. However, vegetation clearance will only be restricted to the mining right area. Therefore, the clearance of vegetation required for the proposed road is likely to impact on the extent and long-term conservation of this vegetation type, which is listed as **Vulnerable**.

The overall significance of the project activities at this site, provided the recommended mitigation measures are implemented, would be moderate negative.

Cumulative Impact

The bulk of the vegetation is disturbed by human settlements. The proposed development will have a negative impact on the vegetation onsite. The additional loss of vegetation as a consequence of the proposed road will therefore have a High cumulative impact.

No-Go Alternative

If the project does not go ahead, the current impacts associated with grazing and the infestation of invasive alien species will continue. However, these are relatively minor within the proposed servitude and as such, the No-go Alternative is classified as **low negative**.

Mitigation Measures:

- ☐ Construction vehicles and machinery must not encroach into identified 'no-go' areas or areas outside the project footprint.
- ☐ Topsoil (20 cm, where possible) must be collected and stored in an area of low sensitivity and used to rehabilitate impacted areas that are no longer requiredduring the operational phase (e.g. laydown areas).
- ☐ Only indigenous species must be used for rehabilitation.
- ☐ Lay down areas must not be located within any watercourses or drainage lines.
- ☐ Employees must be prohibited from making open fires during the construction phase.

- ☐ The Alien Invasive Management Plan should be complied and implemented.
- ☐ An *in-situ* search and rescue plan must be developed and implemented for Succulent Shrubs and geophytic Herbs that will be impacted by the construction of the mine.

Significance Assessment:

Impact	Nature	Duration	Extent	Severity	Likelihood	Significance Before Mitigation	Reversibility	Irreplaceable Loss	Mitigation Potential	Significance After Mitigation
Both Layout Alternatives	Direct	Permanent	Study-Area	Moderate	Definite	**MODERATE (-)**	Reversible	Resource will be partly lost	Achievable	**MODERATE (-)**
Cumulative	Cumulative	Long-Term	Study-Area	Slight	Possible	**LOW (-)**	It is difficult to implement mitigation measures specific to the cumulative impacts as the applicant only has jurisdiction over their development and not over other developments or farming activities in the area. However, it is imperative that the applicant implement the mitigation measures listed above for the direct impacts.			**N/A**
No-Go	Direct	Short-Term	Localised	Moderate	Probable	**LOW (-)**	**N/A**			

IMPACT 4: LOSS OF PLANT SPECIES OF CONSERVATION CONCERN

Cause and Comment

Direct Impact

The permanent loss of plant species of conservation such as *Andropogon appendiculatus* amongst others, mayoccur. Some of these are restricted range species with small Areas of Extent. The severity of the impact will be of high significance if a population of one or more of these species is affected. However, if populations of these species are avoided by the careful placement of infrastructure, the impact can be reduced to moderate significance.

Cumulative Impact

SCC have likely already been lost as a result of the existing developments in the area i.e farming. As such, the loss of SCC associated with the proposed mining activities will likely contribute to the cumulative loss of SCC within the region. However, if the mitigation measures as described in this report are implemented and adhered to, thisimpact can be reduced to moderate negative.

No-Go Alternative

The No-go alternative will not require the clearance of vegetation and will therefore not result in the loss of plant SCC. The no-go alternative is therefore **negligible**.

Mitigation Measures:

☐ If populations of Vulnerable SCC are found, a permit must be obtained for their relocation to a similar habitat type within the site where they will not be disturbed.

Significance Assessment:

Impact	Nature	Duration	Extent	Severity	Likelihood	Significance Before Mitigation	Reversibility	Irreplaceable Loss	Mitigation Potential	Significance After Mitigation
Both Layout Alternatives	Direct	Permanent	Study-Area	Severe	Definite	**HIGH (-)**	Reversible	Resource will be partly lost	Achievable	**MODERATE (-)**
Cumulative	Cumulative	Long-Term	Study-Area	Severe	May Occur	**HIGH (-)**	Reversible	Resource will be partly lost	Achievable	**MODERATE (-)**
No-Go	N/A					**NEGLIGIBLE**	**N/A**			

OPERATIONAL PHASE

No direct loss of habitat is expected during this phase of the project. Alien plant invasion is, however expected to occur. In addition, vehicular transport through the site may increase the risk of roadkill of fauna species that occur.

Loss of habitat					
Phase	**Operational**				
Criteria	**Details / Discussion**				
Description of impact	• Establishment of alien plant species in disturbed areas				
Mitigation required	• Manage alien invasive species establishment continually through chemical or mechanical removal • Reinstate vegetation cover through concurrent rehabilitation • Erect signage to control the speed limit for trucks and other vehicles moving through the site				
Parameters	***Intensity***	***Spatial scale***	***Duration***	***Probability***	***Significance***
Pre-Mitigation	Serious (4)	Limited (2)	Short-term (3-5 years) (3)	Likely (6)	Major (negative) (54)
Post Mitigation	Limited (1)	Minor (2)	Short-term (3-5 years) (3)	Likely (4)	Minor (negative) (24)

DECOMMISSIONING PHASE

No direct loss of habitat is expected during this phase of the project. Alien plant invasion is, however expected to occur as vehicles and machinery move throughout the site and disturb the soil.

Loss of habitat					
Phase	**Decommissioning**				
Criteria	**Details / Discussion**				
Description of impact	• Removal infrastructure and equipment • Disturbance of the soil • Vehicle operation				
Mitigation required	• Minimise the impacted area and revegetate with indigenous where disturbed • Avoid erosion, manage alien invasive species establishment, ensure the re-establishment of natural vegetation • Employ stormwater management measures				
Parameters	***Intensity***	***Spatial scale***	***Duration***	***Probability***	***Significance***
Pre-Mitigation	Very Significant (7)	National (6)	Permanent (6)	Likely (6)	Major (negative) (115)
Post Mitigation	Significant (6)	National (6)	Short-term (3-5 years) (3)	Likely (6)	Minor (negative) (90)

POST CLOSURE PHASE

No direct loss of habitat is expected during this phase of the project. Alien plant invasion should be monitored for up to three years after closure.

Loss of habitat

Phase	**Post-closure**				
Criteria	**Details / Discussion**				
Description of impact	• On-going establishment of alien plant species in disturbed areas				
Mitigation required	• Manage alien invasive species establishment continually through chemical or mechanical removal. • Revegetation of the site where previously disturbed.				
Parameters	***Intensity***	***Spatial scale***	***Duration***	***Probability***	***Significance***
Pre-Mitigation	Serious (4)	Limited (2)	Short-term (3-5 years) (3)	Likely (6)	Major (negative) (54)
Post Mitigation	Limited (1)	Minor (2)	Short-term (3-5 years) (3)	Likely (4)	Minor (negative) (24)

6. IMPACT STATEMENT, CONCLUSIONS AND RECOMMENDATIONS

6.1 DISCUSSION

The proposed project area is located in an area that is regarded as ecologically intact, moderate in plant species diversity with a large number of endemic species. The area has evidence of disturbance from of wood harvesting, farming activities and grazing. According to the above risk assessment the proposed project and associated infrastructures will place additional pressure on the environment especially on the fauna; that will be subjected to increased human presence, reduction in habitat and elevated noise levels. The results of the fauna survey indicate that fauna activity within the area might decline as a result of the proposed mining activities around the area. Further to this, the cumulative loss of fauna and flora is expected. The proposed project is traverses an Ecological Support Area (ESA) and is characterised by the vulnerable vegetation types. A large percentage of the vegetation type is already transformed (Mucina and Rutherford, 2006). The proposed mining activities will be limited to the mining right properties. The loss of habitat will result in the Loss of endemic plant diversity in the study site, which will have a knock down effect on the loss of faunal biodiversity and a resultant loss of faunal SSC. This is of specific relevance to invertebrates since they are dependent on those plant species. Due to the nature of the proposed development, the impact is expected to be negative. The impacts can be minimised by employing the relevant mitigation measures. Mawenje Consulting Africa (MCA) was expected to identify and collect the GPS coordinates of the protected plant species such as Leadwood and Marula tree, this activity should be done at the right season. This activity should be conducted prior to construction or preparation of the site for mining, so as the necessary permits can be acquired.

6.2 CONCLUSION AND RECOMMENDATIONS

The site inspection was conducted during dry season, and thus there are plant species that may have been missed or misidentified. Some plant species that emerge and bloom during another time of the year or under very specific circumstances may have been missed entirely. It is important to schedule a follow-up site inspection in order to update the report where necessary, including the development of additional fine scale maps that will capture the sensitivity of the site.

The sites were surveyed on the 09th of July 2022 to ascertain the overall state of biodiversity. According to the South African National Biodiversity Institute (SANBI) the proposed mining traverses an Ecological Support Area (ESA) is classified as a (ESA), this implies that a Ecological Support Areas are not essential for meeting biodiversity targets but play an important role in supporting the ecological functioning of Critical Biodiversity Areas and/or in delivering ecosystem services. The proposed site has suffered veld transformation due to the farming, human settlements and poor veld management. **Due to seasonality issues, a follow-up site visit will be done in spring to verify the findings of this report.**

6.3 MITIGATION MEASURE OBJECTIVES

The focus of mitigation measures should be to reduce the significance of potential impacts associated with the development and thereby to:

- Prevent the further loss and fragmentation of this vegetation community and the CBAs and ESAs in the vicinity of the project site; and
- Prevent the loss of the faunal community associated with this vegetation community.

- Some of the sensitive species that can occur onsite may be affected by the proposed development (such as *Sclerocarya birrea* and *Combretum imberbe*). These species are protected within South Africa under the National Forest Act (Act 84 of 1998) and therefore application.for permits to remove them should be acquired from the relevant authority prior to commencement of the proposed development.
- If any of the plant Species of Special Concern such as the Marula tree are identified during clearing of vegetation for the mining area, they should be recorded with a GPS and reported so that a relocation strategy can be employed by a suitably qualified botanical specialist. Given that plant SSC are present in large numbers on site, it is highly likely that some of these species will be encountered. No plant SSC should be destroyed as a result of the proposed activity.
- A laminated brochure can be developed with photos and given to operators on site, all SSC can be marked with biodegradable tape and permits applied for. Large plants are to be replaced by three young plants, medium plants by two plants and small plants by similar size plants. A database should be set up to include the following: species, number of individuals, GPS co-ordinates, size, height, and whether they area multistemmed.
- Fauna and Flora monitoring is recommended. The following should be adhered to for the monitoring programme:
    - ❖ Monitoring must take place annually.
    - ❖ Monitoring must be completed by qualified specialists;
    - ❖ Adaptive management must be applied;
    - ❖ Monitoring during the wet season is essential; and
    - ❖ Findings must be compared to previous years.

6.3.1 Mitigation Measures for Impacts on Faunal Communities

Recommended mitigation and rehabilitation measures for faunal community's hinge largely on protecting their habitats and ensuring it remains intact. In additional to this the following measures are recommended:

- If any faunal species are recorded during construction, especially the protected species found on site, activities should temporarily cease, and an appropriate specialist should be consulted to identify the correct course of action;
- Staff should be educated about the sensitivity of faunal species and measures should be put in place to deal with any species that are encountered during the construction process. The intentional killing of any animals including snakes, lizards, birds or other animals should be strictly prohibited; and
- The areas that were delineated with the lowest sensitivities should be the only areas considered for development;

6.3.2 Mitigation Measures for Impacts on Vegetation Communities

Recommended mitigation and rehabilitation measures include the following:

- As far as possible, the proposed developments should be placed in areas that have already been disturbed and transformed (low sensitivity areas). It is recommended that areas to be developed be specifically demarcated so that during the construction phase, only the demarcated areas be impacted upon;
- The areas rated as highly sensitive in the project area as defined in this report, should be declared a 'no-go' area during the construction phase and all efforts must be made to prevent access to this area from construction workers and machinery;

- A qualified environmental control office must be on site when construction begins to identify species that will be directly disturbed and to relocate fauna/flora that is found during construction;
- Furthermore, areas of indigenous vegetation, even secondary communities should under no circumstances be fragmented or disturbed further or used as an area for dumping of waste;
- Areas that are denuded during construction need to be re-vegetated with indigenous vegetation to prevent erosion during flood events. This will also reduce the likelihood of encroachment by alien invasive plant species; and
- Compilation of and implementation of an alien vegetation management plan for the entire site.

6.4 STATEMENT AND OPINION OF THE SPECIALIST

An impact statement is required as per the NEMA regulations with regards to the proposed development. Considering the above-mentioned conclusions, it is the opinion of the specialist that the proposed development will have a significant impact on the area. The sensitivity map should be considered vital regarding any development plans as the moderate and highly sensitive areas should be avoided during any future development. The mitigation measures should be strictly adhered to and enforce. With the understanding that mining will unlock economic opportunities in the area, the project can be allowed to proceed , if the developer is willing to adhere to the mitigation measures as outlined in this report and commit to rehabilitating the affected areas.

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8. APPENDICES

8.1 APPENDIX 1: SPECIES ASSOCIATED WITH THE SVL 4 DELAGOA LOWVELD

VEGTYPE	NAME OF VEGETATION TYPE. FULL NAME, E.G. SVCB 21 SOUTPANSBERG MOUNTAIN BUSHVELD
TAXONLIST	Important Taxa; Endemic Taxa; Biogeogrphically Important Taxa.
SUBDIVISION	Vegetation type subdivision (optional, e.g. 'Mistbelt bush clumps', 'Open savanna sandveld' in SVcb 21 Soutpansberg Mountain Bushveld)
FAMILYNAME	Name of family in which the taxon is classified. This is not essential, but is useful for quality control purposes.
GROWTHFORM	Refer to Table 2.1 (page 26 of Mucina & Rutherford (2006))
TAXONNAME	Name of taxon. Normally no subspecies or variety, unless they are diagnostic or endemic. Avoid sp. or spp. Do not abbreviate genus names - that comes in the formatting stage.
SUPERSCRIPT	Superscript. It must include an explanation of what the superscript means.
TEXT FOR SUPERSCRIPT	e.g. ([T]Cape thickets, [W]Wetlands) — e.g. T for 'Cape Thickets' in FFs1, page 99 of Mucina & Rutherford (2006)
DOMINANT	Dominant (biomass) or prominent (e.g. conspicuous). See p. 27 of Mucina & Rutherford (2006). Other unformatted suggested text can be put here.
SORT	This gives the order in which the author intends the species to be listed. Not essential, but highly desirable to give the author's choice.
QUALIFIER	Any qualifier as it appears in the book.e.g. variant 'speciosa'; (West Coast endemic); (southernmost distribution limit)
GROWTH FORM SORT	Refer to the tab **Growth forms and order**. The order should normally follow the order already used in the biome.

VegType	TaxonList	SubDivision	FamilyName	GrowthForm	TaxonName	Superscript	Dominant	Sort	Qualifier	Growth Form Sort
SVl 4 Delagoa Lowveld	Important Taxa		ACANTHACEAE	Herbs	Blepharis integrifolia			24286		19
SVl 4 Delagoa Lowveld	Important Taxa		ACANTHACEAE	Herbs	Ruellia patula			24288		19
SVl 4 Delagoa Lowveld	Important Taxa		ACANTHACEAE	Low Shrubs	Justicia flava			24274		6
SVl 4 Delagoa Lowveld	Important Taxa		AMARANTHACEAE	Herbs	Kyphocarpa angustifolia			24287		19
SVl 4 Delagoa Lowveld	Important Taxa		ANACARDIACEAE	Tall Shrubs	Rhus gueinzii			24272		7
SVl 4 Delagoa Lowveld	Important Taxa		ASPHODELACEAE	Succulent Herb	Aloe parvibracteata			24289		21
SVl 4 Delagoa Lowveld	Important Taxa		BORAGINACEAE	Tall Shrubs	Ehretia rigida subsp. rigida			24269		7
SVl 4 Delagoa Lowveld	Important Taxa		BORAGINACEAE	Woody Climbers	Cordia ovalis		[d]	24276		13
SVl 4 Delagoa Lowveld	Important Taxa		CAPPARACEAE	Tall Shrubs	Boscia mossambicensis			24267		7
SVl 4 Delagoa Lowveld	Important Taxa		CAPPARACEAE	Tall Shrubs	Maerua parvifolia		[d]	24266		7
SVl 4 Delagoa Lowveld	Important Taxa		CAPPARACEAE	Woody Climbers	Capparis tomentosa			24277		13
SVl 4 Delagoa Lowveld	Important Taxa		EBENACEAE	Tall Shrubs	Euclea divinorum		[d]	24265		7
SVl 4 Delagoa Lowveld	Important Taxa		EUPHORBIACEAE	Small Trees	Spirostachys africana		[d]	24263		1
SVl 4 Delagoa Lowveld	Important Taxa		FABACEAE	Small Trees	Acacia senegal var. rostrata		[d]	24259		1
SVl 4 Delagoa Lowveld	Important Taxa		FABACEAE	Small Trees	Acacia welwitschii subsp. delagoensis		[d]	24260		1
SVl 4 Delagoa Lowveld	Important Taxa		FABACEAE	Small Trees	Albizia petersiana		[d]	24261		1
SVl 4 Delagoa Lowveld	Important Taxa		FABACEAE	Small Trees	Schotia capitata		[d]	24262		1
SVl 4 Delagoa Lowveld	Important Taxa		FABACEAE	Tall Shrubs	Dichrostachys cinerea			24268		7
SVl 4 Delagoa Lowveld	Important Taxa		MALVACEAE	Low Shrubs	Abutilon austro-africanum			24273		6
SVl 4 Delagoa Lowveld	Important Taxa		MALVACEAE	Tall Shrubs	Grewia bicolor			24271		7
SVl 4 Delagoa Lowveld	Important Taxa		PHYLLANTHACEAE	Tall Shrubs	Flueggea virosa			24270		7
SVl 4 Delagoa Lowveld	Important Taxa		POACEAE	Graminoids	Aristida congesta			24282		25
SVl 4 Delagoa Lowveld	Important Taxa		POACEAE	Graminoids	Chloris roxburghiana			24283		25
SVl 4 Delagoa Lowveld	Important Taxa		POACEAE	Graminoids	Chloris virgata		[d]	24278		25
SVl 4 Delagoa Lowveld	Important Taxa		POACEAE	Graminoids	Dactyloctenium aegyptium			24284		25
SVl 4 Delagoa Lowveld	Important Taxa		POACEAE	Graminoids	Panicum coloratum		[d]	24279		25
SVl 4 Delagoa Lowveld	Important Taxa		POACEAE	Graminoids	Panicum maximum		[d]	24280		25

SVl 4 Delagoa Lowveld	Important Taxa	POACEAE	Graminoids	Sporobolus nitens	[d]	24281	25
SVl 4 Delagoa Lowveld	Important Taxa	POACEAE	Graminoids	Tragus berteronianus		24285	25
SVl 4 Delagoa Lowveld	Important Taxa	RUTACEAE	Low Shrubs	Zanthoxylum humile		24275	6
SVl 4 Delagoa Lowveld	Important Taxa	SAPINDACEAE	Small Trees	Pappea capensis		24264	1

8.2 APPENDIX 2- INVADER WEEDS AND PLANTS (SECTION 80 (1) (a))

Common name	Scientific name
silver wattle	Acacia dealbata
green wattle	A. decurrens
black wattle	A. mearnsii
Australian black wattle	A. melanoxylon
American agave	Agave americana
Sisal	A. sisalana
Invading ageratum	Ageratum convzoides
Mexican ageratum	A. houstonianum
blue gums	All Eucalyptus spp
Poplars	All Populus spp.
giant reed	Arundo donax
Common blackjack	Bidens pilosa
Mauritius thorn	Caesalphinia decapetala
Balloon vine	Cardiospermum grandiflorum
heart pea	C. hallicacabum
queen of the night	Cereus jamacaru
Yellow/orange cestrum	Cestrum aurantiacum
ink berry	C laevigatum
triffid weed	Chromolaena odorata
Scotch thistle	Cirsium vulgare
Pampas grass	Cortaderia spp.
Common dodder	Cuscuta campestris
large thorn tree	Datura ferox
Jacaranda	Jacaranda mimosifolia
Syringa	Melia azedarach
Lantana	Lantana camara
sweet prickly pear	Opuntia ficus-indica
Imbricate prickly pear	O. imbricata
Australian pest pear	O. stricta
Passion fruit	Passiflora edulis
Granadina	P. subpeitata
Fountain grass	Penisetum setaceum
Cluster pine	Pinus pinaster
Pines	(all other Pinus spp.)
Guava	Psidium guajava
kudzu vine	Pueraria lobata
Yellow firethorn	Pyracantha angustifolia
castor-oil plant	Ricinus communis
Brambles	Rubus spp.
Peanut butter cassia	Senna didymobotrva
red sesbania	Sesbania punicea
Bugweed	Solanum mauritianum
spiny cocklebur	Xanthium spinoum
large cocklebur	X strumarium
Common thorn apple	D. stramonium