



# Desktop Terrestrial Ecological Assessment for the proposed Prospecting Right Application on the farm Bishop 671

POSTMASBURG, NORTHERN CAPE

CLIENT: IMPALA MINING HOLDINGS

26 SEPTEMBER 2022

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## Declaration

I Ndumiso Ian Dlamini, as duly authorised representative of 9ZeroSeven Environmental, hereby confirm my independence and declare that I:

- ❖ I act as the independent specialist in this application;
- ❖ I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;
- ❖ I declare that there are no circumstances that may compromise my objectivity in performing such work;
- ❖ I have expertise in conducting the specialist report relevant to this application, including knowledge of the Act, regulations and any guidelines that have relevance to the proposed activity;
- ❖ I will comply with the Act, regulations and all other applicable legislation;
- ❖ I have no, and will not engage in, conflicting interests in the undertaking of the activity;
- ❖ I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing any decision to be taken with respect to the application by the competent authority; and the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
- ❖ all the particulars furnished by me in this form are true and correct; and
- ❖ I realise that a false declaration is an offence in terms of Regulation 71 and is punishable in terms of Section 24F of the Act.

Signature of the specialist:	<i>Ndumiso N. I. Dlamini</i>
Designation:	Ecologist (Pr. Sci. Nat.)
Qualifications:	BSc Life and Environmental Sciences (UJ) BSc Hons Botany (UJ)
Experience (years):	Eight (8)
Date:	26 September 2022

## 1 Introduction

9ZeroSeven (907) Environmental was commissioned to conduct a desktop terrestrial ecological assessment the proposed Bishop Prospecting Application project in the Postmasburg area in the Northern Cape Province.

This report presents the results of a desktop terrestrial ecological assessment completed for the proposed project. This report should be interpreted after taking into consideration the findings and recommendations provided by the specialist herein. Further, this report should inform and guide the Environmental Assessment Practitioner (EAP) and regulatory authorities, enabling informed decision making, as to the ecological viability of the proposed project.

### 1.1 Aim and objectives

As part of this assessment, the following objectives were established:

- ❖ The desktop characterisation of ecological areas within the project area;
- ❖ The desktop delineation of freshwater ecosystems within the proposed project area;
- ❖ The desktop delineation of vegetation units within the proposed project area
- ❖ The desktop evaluation of the extent of site-related effects in terms of selected ecological indicators;
- ❖ An impact assessment for the proposed project; and
- ❖ The prescription of mitigation measures and recommendations for the identified impacts.

## 2 Key Legislative Requirements

The legislation, policies and guidelines listed below are applicable to the current project in terms of biodiversity and ecological support systems. The list below, although extensive, may not be complete and other legislation, policies and guidelines may apply in addition to those listed below.

Explanation of certain documents or organisations is provided where these have a high degree of relevance to the project and/or are referred to in this assessment.

### 2.1 International Legislation and Policy

- ❖ Convention on Biological Diversity (Rio de Janeiro, 1992);
- ❖ The Ramsar Convention (on wetlands of international importance);
- ❖ The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). CITES is an international agreement between governments. Its aim is to ensure that international trade in specimens of wild animals and plants does not threaten their survival; and
- ❖ The IUCN (World Conservation Union). The IUCN's mission is to influence, encourage and assist societies throughout the world to conserve the integrity

and diversity of nature and to ensure that any use of natural resources is equitable and ecologically sustainable

## 2.2 National Legislation

- ❖ Constitution of the Republic of South Africa (Act 108 of 1996). The Bill of Rights, in the Constitution of South Africa states that everyone has a right to a nonthreatening environment and requires that reasonable measures be applied to protect the environment. This protection encompasses preventing pollution and promoting conservation and environmentally sustainable development;
- ❖ The National Environmental Management Act (NEMA) No. 107 of 1998; Ecological Assessment Regulations, 2014. Specifically, the requirements of the specialist report as per the requirements of Appendix 6;
- ❖ The National Environmental Management: Biodiversity Act (NEM:BA) No. 10 of 2004: specifically, the management and conservation of biological diversity within the RSA and of the components of such biological diversity;
- ❖ National Environmental Management: Biodiversity Act, 2004: Threatened and Protected Species Regulations;
- ❖ National Environmental Management: Protected Areas Act, 2003 (Act 57 of 2003);
- ❖ National Water Act, 1998 (Act 36 of 1998);
- ❖ Environmental Conservation Act, 1989 (ECA), (Act no. 73 of 1989);
- ❖ National Forests Act, 1998 (Act 84 of 1998), specifically with reference to Protected Tree species;
- ❖ National Heritage Resources Act, 1999 (Act 25 of 1999);
- ❖ Conservation of Agricultural Resources Act, 1983 (Act 43 of 1983).

## 2.3 National Policy and Guidelines

- ❖ South Africa's National Biodiversity Strategy and Action Plan (NBSAP);
- ❖ National Spatial Ecological Assessment (NSBA); and
- ❖ National Freshwater Ecosystem Priority Areas (NFEPA's)
- ❖ National Biodiversity Assessment (NBA) (2018).

## 2.4 Provincial and Municipal Level

In addition to national legislation, South Africa's nine provinces have their own provincial biodiversity legislation, as nature conservation is a concurrent function of national and provincial government in terms of the Constitution (Act 108 of 1996).

- ❖ Northern Cape Biodiversity Conservation Plan Critical Biodiversity Areas (2016).



## 2.5 Structure of the Report

Aspect	Section
The person who prepared the report; and the expertise of that person to carry out the specialist study or specialised process.	Section 6
A declaration that the person is independent	Page viii
An indication of the scope of, and the purpose for which, the report was prepared	Section 1.1
A description of the methodology adopted in preparing the report or carrying out the specialised process	Section 4
A description of any assumptions made and any uncertainties or gaps in knowledge	Section 5
(f) a description of the findings and potential implications of such findings on the impact of the proposed activity, including identified alternatives, on the environment	Section 8
Recommendations in respect of any mitigation measures that should be considered by the applicant and the competent authority	Section 9
A description of any consultation process that was undertaken during the course of carrying out the study	N/A
A summary and copies of any comments that were received during any consultation process	N/A
Any other information requested by the competent authority.	N/A

### 3 Description of the Project Area

The project area is located on farm Bishop 671 in the Northern Cape Province as presented in Figure 3-1. The project area is located approximately 40km north of Postmasburg and 30km south of Khathu.

The proposed project is situated in the quaternary catchments D41J, within the Vaal Water Management area and Southern Kalahari Ecoregion. The portion of the WMA the project area is located in was previously the Lower Vaal; WMA, that was reclassified and incorporated into the Vaal WMA (NWA, 2016).

This part of the WMA is situated in the north-western part of South Africa, bordering on Botswana in the north. Climate in the region is semi-arid to arid, with rainfall varying from 100 mm (in dry years) to 500 mm annually. The western part of the WMA may experience evaporation reaching 2 800 mm per year. Each of the three subareas display distinctive streamflow patterns. Flow in the Vaal River is perennial, fed by high rainfall and regulation upstream, the Harts River is characterised by highly intermittent runoff, and the Molopo and Kuruman Rivers are endorheic and typically drying up after some distance due to infiltration and evaporation. Mining of Iron ore, diamonds and manganese occurs in the WMA. Utilisable surface water resources in the Lower Vaal WMA are limited to the fully regulated Vaal and Harts Rivers. Water quality is of special concern in the lower reaches of the Harts and the Vaal Rivers because of the high salinity of leach water from the Vaalharts irrigation scheme. To counter this problem, better quality water is transferred from the Orange River to the Douglas Weir in the lower reaches of the Vaal River for blending purposes (StatsSA, 2010).

The land uses within the local area is predominantly low density, semi-rural farm homesteads, transformed grasslands utilized for grazing and cultivation.



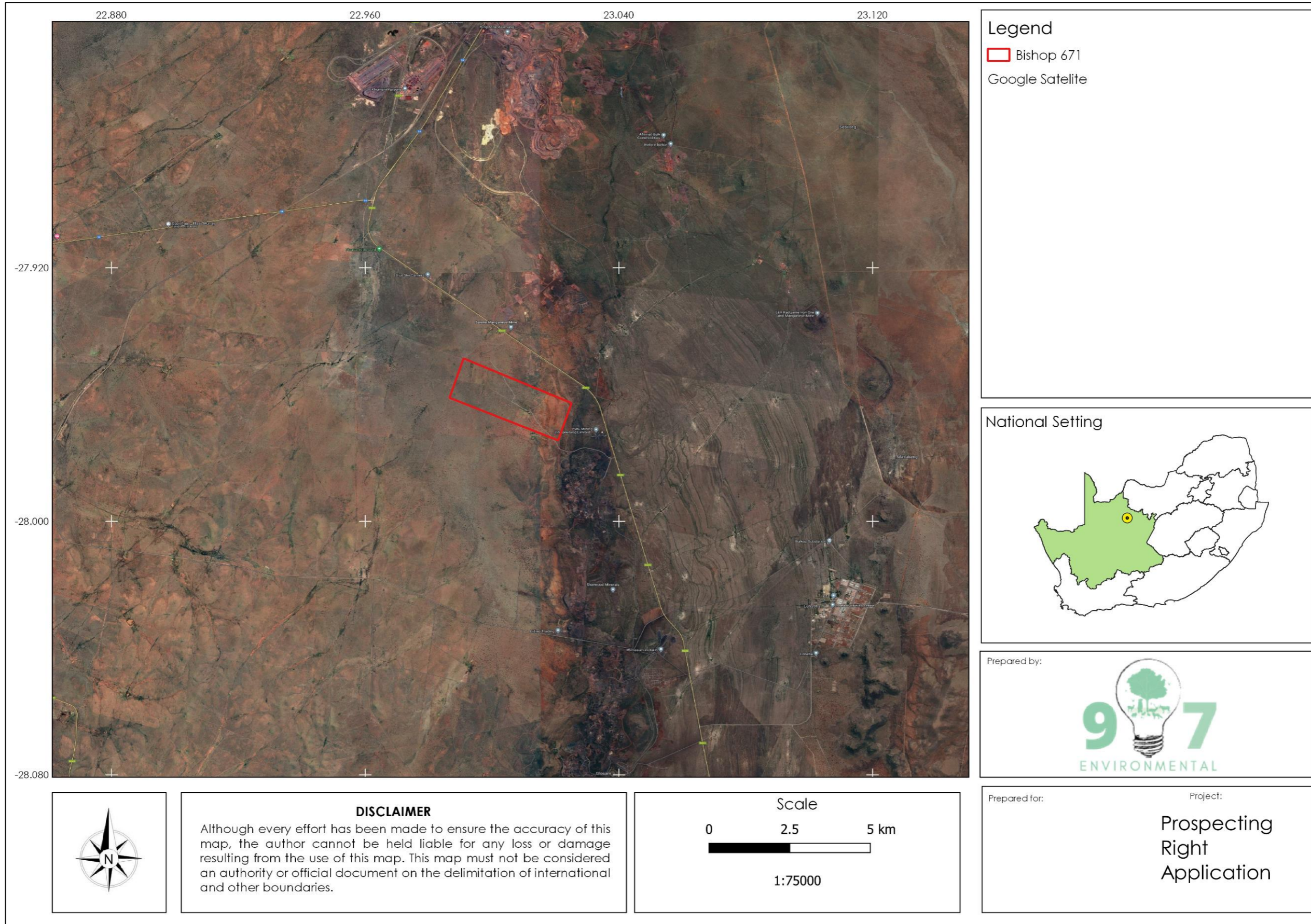


Figure 3-1: Location of the Project Area



### 3.1 Climate

The area is characterised as a summer and autumn rainfall with very dry winters. The Mean Annual Precipitation (MAP) of the area is estimated around 300-450mm. The winters can be cold with frost being frequent in the area. The climate diagram for the area is presented in Figure 3-2.

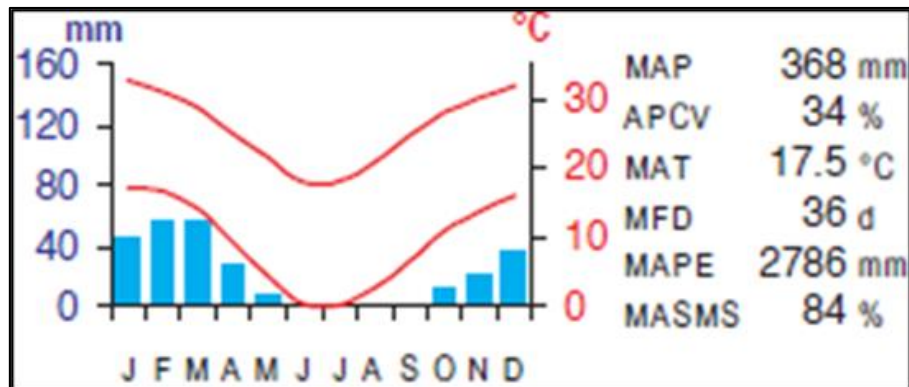


Figure 3-2: Climate diagram (Mucina and Rutherford, 2006)

### 3.2 Desktop Soils

The geology of the area consists of Campbell Group dolomites and chert along with younger superficial sediments of the Kalahari Group.

According to the land type database (Land Type Survey Staff, 1972-2006) the project falls largely within the Ae Landtype Class. The landtype was characterised by red-yellow apedal soils that are freely drained. Hutton soils are highly frequent in the area.

## 4 Approach

A desktop study was undertaken, aiming to identify:

### 4.1 Flora

- ❖ Potential species in the site area according to the South African National Biodiversity Institute (SANBI);
- ❖ Potential Red Data species and their current status; and
- ❖ Expected vegetation type and community structure, (Mucina and Rutherford 2006).

### 4.2 Fauna

- ❖ The SIBIS online interactive species distribution map was used to obtain data for the distribution of mammals, reptiles, amphibians and terrestrial invertebrates within the greater study area. Data was acquired for the Quarter Degree Squares (QDS) in which the study is located;
- ❖ The potential occurrence of mammals was supplemented by the species distribution maps in Friedman and Daly (2004), and Smithers (2002);

- ❖ Lists of birds found in the Quarter Degree Square (QDS) for the study area were determined using online data from the South African Bird Atlas Project (SABAP 2) for 2012;
- ❖ The Convention on International Trade of Endangered Species (CITES) species database;
- ❖ The IUCN Red-Data List for South African fauna;
- ❖ The International IUCN Red-Data List, and;
- ❖ National Environmental Management Biodiversity Act (NEMBA 10 of 2004) listed species.

### 4.3 Wetland Assessment

The National Wetland Classification Systems (NWCS) developed by the South African National Biodiversity Institute (SANBI) was considered for this study. This system comprises a hierarchical classification process of defining a wetland based on the principles of the hydrogeomorphic (HGM) approach at higher levels. In addition, the method also includes the assessment of structural features at the lower levels of classification (Ollis *et al.*, 2013). The following datasets and resources were utilised for the desktop assessment:

- ❖ Information as presented by the South African National Biodiversity Institutes (SANBI's) Biodiversity Geographic Information Systems (BGIS) website (<http://bgis.sanbi.org>);
- ❖ Aerial imagery (Google Earth Pro);
- ❖ Land Type Data (Land Type Survey Staff 1972 - 2006)
- ❖ The National Freshwater Ecosystem Priority Areas (Nel, *et al.* 2011);
- ❖ Contour data (5m).

### 4.4 Buffer Determination

A buffer zone is defined as "A strip of land with a use, function or zoning specifically designed to protect one area of land against impacts from another." (Macfarlane, *et al.*, 2014).

Buffer zones protect water resources in a variety of ways, such as;

- ❖ Maintenance of basic aquatic processes;
- ❖ The reduction of impacts on water resources from activities and adjoining land uses;
- ❖ The provision of habitat for aquatic and semi-aquatic species;
- ❖ The provision of habitat for terrestrial species; and
- ❖ The provision of societal benefits.

The "Preliminary Guideline for the Determination of Buffer Zones for Rivers, Wetlands and Estuaries" (Macfarlane, *et al.*, 2014) was used to determine the appropriate buffer zone for the proposed activity.

## 5 Limitations and Assumptions

The following assumptions and limitations are applicable to this report:

- ❖ The study is limited to a desktop assessment of the project area;
- ❖ All delineations are based on aerial imagery; and
- ❖ The lack of information regarding the activities to be completed on the site, only allowed for a general assessment on the impacts and the buffer requirement.

## 6 Expertise of the Specialist

Ndumiso Dlamini obtained his BSc Hons degree in Botany in 2011 at the University of Johannesburg and is a registered Pr. Sci. Nat with SACNASP (116579) in Botanical Science and Ecological Science. Ndumiso has been conducting biodiversity, ecological and water resources assessments as an Environmental Consultant for over 8 years. He has performed numerous ecological impact assessments for various projects which include mining, housing developments, roads and infrastructure and rehabilitation. A detailed CV can be made available on request.

## 7 Desktop Assessment

A high-level desktop assessment was conducted to identify watercourse features within 500m of the project area.

### 7.1 Regional Vegetation

The project area was located predominantly within the Kuruman Thornveld and Olifantshoek Plains Thornveld with a portion in the Kathu Bushveld as presented in Figure 7-1.

The Kuruman Thornveld vegetation unit is restricted to the Northern Cape Province. The vegetation unit occurs in altitudes of 1100 m – 1500 m above sea level. The vegetation unit is characterised by flat rocky plains that support a well-developed open tree and shrub layer. The well-developed canopy is dominated by *Vechelia luederitzii*, *Boscia albitrunca* and *Searsia tenuinervis*. The grass layer is usually a sparse habitat with tree layer being dominant.

The Olifantshoek Plains Thornveld vegetation unit occurs North-West and Northern Cape provinces. The vegetation unit occurs in altitudes of 1100 m – 1500 m above sea level. The vegetation unit falls within a summer and autumn rainfall climate with MAP of between 300-450 mm. The vegetation unit is characterised by flat rocky plains with some gently sloping hills carrying a well-developed and closed shrub layer. The well-developed tree canopy is dominated by *Vechelia erioloba* in natural conditions.

The Kathu Bushveld vegetation unit is limited to the Northern Cape Province. The vegetation unit occurs in altitudes of 960 m – 1300 m above sea level. The vegetation unit is characterised by medium to tall tree layer that is dominated in alternating areas

by *Vechelia erioloba* and *Boscia albitrunca*. The shrub layer is comprised of *Vechelia mellifera*, *Diospyros lyciodes* and *Lycium hirsutum*.

The status of the vegetation, as at the time of publishing (2006), is summarised in Table 7-1 and the dominant plant species within the vegetation unit are shown in Table 7-2. The vegetation units are mainly transformed by cultivation, plantations, mines, urbanisation and by building of dams. No serious alien invasions are reported (Mucina & Rutherford, 2006).

**Table 7-1: Vegetation Status**

Vegetation Name	Ecological Status	Conservation Status	% of Project Area
Kuruman Thornveld	Moderately Modified	LC	40
Olifantshoek Plains Thornveld	Moderately Modified	LC	40
Khathu Bushveld	Moderately Modified	LC	20

**Table 7-2: Dominant Plant Species**

Vegetation Unit	Dominant Plant Species		
	Graminoids	Trees	Shrubs
Kuruman Thornveld	<i>Melinis repens</i> , <i>Aristida meridionalis</i> , <i>Aristida stipitata</i> subsp. <i>stipitata</i> , <i>Eragrostis lehmanniana</i> , <i>Eragrostis echinochloidea</i>	<i>Vechelia erioloba</i> , <i>Vechelia mellifera</i> subsp. <i>detinens</i> , <i>Boscia albitrunca</i>	<i>Monechma divaricatum</i> , <i>Gnidia polycephala</i> , <i>Helichrysum zeyheri</i> , <i>Hermannia comosa</i> , <i>Pentzia calcarean</i> , <i>Plinthus sericeus</i>
Olifantshoek Plains Thornveld	<i>Digitaria eriantha</i> subsp. <i>eriantha</i> , <i>Eragrostis lehmanniana</i> , <i>Heteropogon contortus</i> , <i>Melinis repens</i>	<i>Vechelia erioloba</i> , <i>Vechelia karoo</i> , <i>Boscia albitrunca</i> , <i>Zizohus mucronata</i> , <i>Searsia lancea</i> , <i>Vechelia tortilis</i>	<i>Searsia tridactyla</i> , <i>Diospyros lyciodes</i> , <i>Ehretia rigida</i> , <i>Gewia flava</i> , <i>Gomphocarpus fruticosus</i> subsp. <i>fruticosus</i>
Khathu Bushveld	<i>Aristida meridionalis</i> , <i>Brachiaria nigropedata</i> , <i>Aristida congesta</i> , <i>Eragrostis lehmanniana</i> , <i>Schmidtia pappophoroides</i> , <i>Stipagrostis ciliata</i>	<i>Vechelia mellifera</i> subsp. <i>detinens</i> , <i>Boscia albitrunca</i> , <i>Terminalia seicea</i> ,	<i>Diospyros lyciodes</i> subsp. <i>lyciodes</i> , <i>Grewia flava</i> , <i>Gymnosporia buxifolia</i>



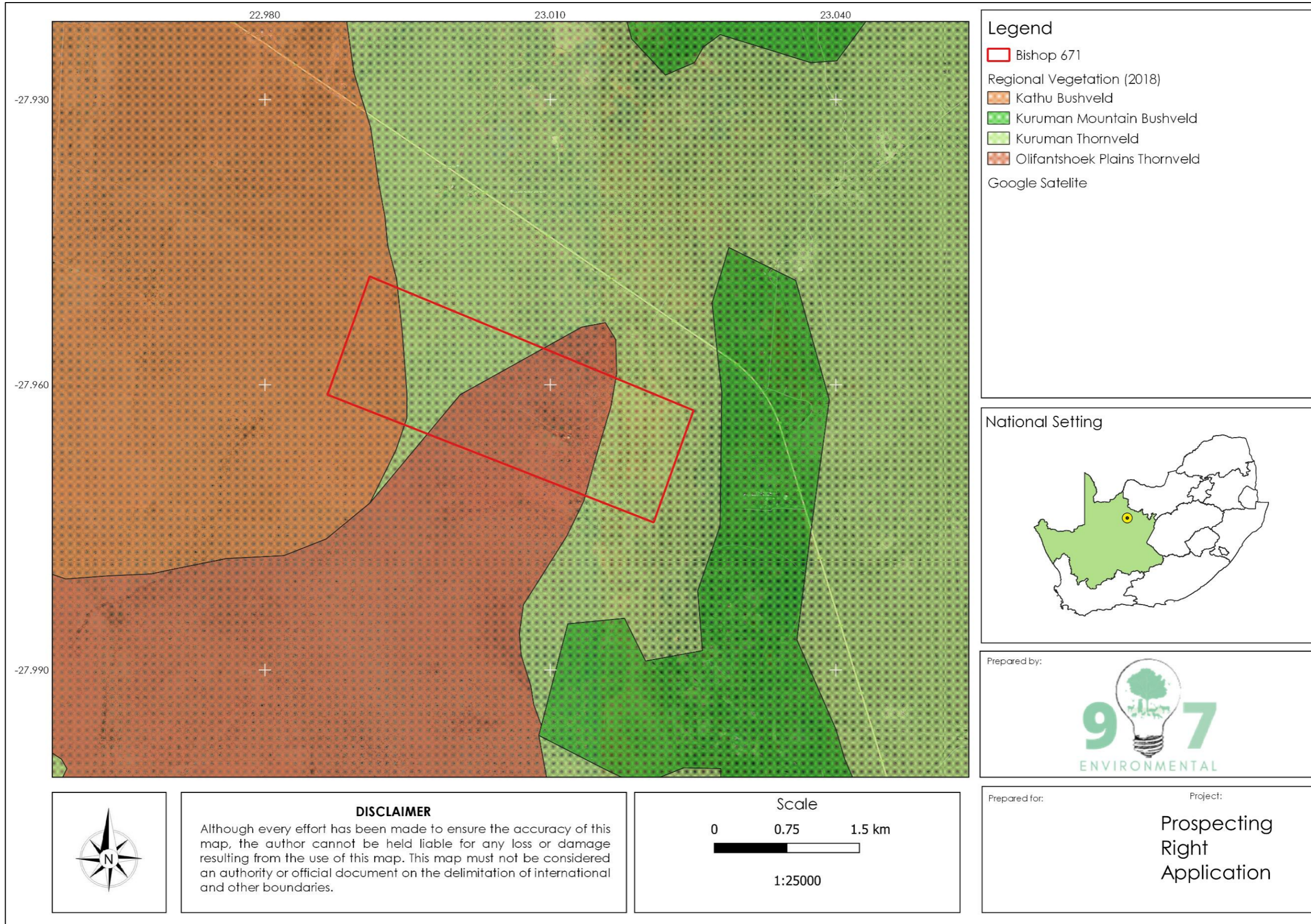


Figure 7-1: The regional vegetation associated with the proposed project



## 7.2 Plant Species List

The Plants of Southern Africa (POSA) Database was utilised to obtain a list of plant species that could occur within the project area. The plant presented in Table 7-3 presents plant species of conservation concern that may occur in the project area.

**Table 7-3: Plant Taxa that may be found in the project area (POSA, 2022)**

Family	Species Name	Ecology
Asparagaceae	<i>Asparagus cooperi</i>	Indigenous
Agavaceae	<i>Chlorophytum fasciculatum</i>	Indigenous
Ricciaceae	<i>Riccia okahandjana</i>	Indigenous
Capparaceae	<i>Boscia foetida</i> subsp. <i>foetida</i>	Indigenous
Cyperaceae	<i>Schoenoplectus muricinux</i>	Indigenous
Nyctaginaceae	<i>Boerhavia cordobensis</i>	Not indigenous; Naturalised
Talinaceae	<i>Talinum arnotii</i>	Indigenous
Malvaceae	<i>Hibiscus pusillus</i>	Indigenous
Fabaceae	<i>Calpurnia aurea</i> subsp. <i>aurea</i>	Indigenous
Fabaceae	<i>Indigofera cryptantha</i> var. <i>cryptantha</i>	Indigenous
Poaceae	<i>Urochloa panicoides</i>	Indigenous
Juncaceae	<i>Juncus dregeanus</i> subsp. <i>dregeanus</i>	Indigenous
Asteraceae	<i>Osteospermum leptolobum</i>	Indigenous; Endemic
Asteraceae	<i>Chrysocoma obtusata</i>	Indigenous
Poaceae	<i>Schmidtia kalahariensis</i>	Indigenous
Vahliaceae	<i>Vahlia capensis</i> subsp. <i>vulgaris</i> var. <i>linearis</i>	Indigenous
Euphorbiaceae	<i>Euphorbia inaequilatera</i> var. <i>inaequilatera</i>	Indigenous
Malvaceae	<i>Hermannia</i> sp.	
Fabaceae	<i>Lessertia frutescens</i> subsp. <i>frutescens</i>	Indigenous
Asteraceae	<i>Helichrysum argyrosphaerum</i>	Indigenous
Fabaceae	<i>Lotononis parviflora</i>	Indigenous; Endemic
Thymelaeaceae	<i>Lasiosiphon polycephalus</i>	Indigenous
Verbenaceae	<i>Chascanum pinnatifidum</i> var. <i>pinnatifidum</i>	Indigenous
Celastraceae	<i>Putterlickia saxatilis</i>	Indigenous; Endemic
Asteraceae	<i>Lopholaena cneorifolia</i>	Indigenous
Fabaceae	<i>Indigofera sessilifolia</i>	Indigenous
Lamiaceae	<i>Acrotome inflata</i>	Indigenous
Scrophulariaceae	<i>Selago albida</i>	Indigenous
Asteraceae	<i>Osteospermum muricatum</i> subsp. <i>muricatum</i>	Indigenous
Neuradaceae	<i>Grielum humifusum</i> var. <i>parviflorum</i>	Indigenous
Loranthaceae	<i>Tapinanthus oleifolius</i>	Indigenous
Apocynaceae	<i>Acokanthera oppositifolia</i>	Indigenous

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Family	Species Name	Ecology
Malvaceae	<i>Hermannia desertorum</i>	Indigenous
Fabaceae	<i>Cullen tomentosum</i>	Indigenous
Fabaceae	<i>Indigofera daleoides</i> var. <i>daleoides</i>	Indigenous
Malvaceae	<i>Sida chrysantha</i>	Indigenous
Lobeliaceae	<i>Lobelia erinus</i>	Indigenous
Santalaceae	<i>Thesium hystrix</i>	Indigenous
Apocynaceae	<i>Hoodia</i> sp.	
Oxalidaceae	<i>Oxalis lawsonii</i>	Indigenous
Asteraceae	<i>Pentzia calva</i>	Indigenous
Asteraceae	<i>Dicoma capensis</i>	Indigenous
Amaranthaceae	<i>Exomis microphylla</i> var. <i>axyrioides</i>	Indigenous; Endemic
Asteraceae	<i>Chrysocoma ciliata</i>	Indigenous
Portulacaceae	<i>Portulaca kermesina</i>	Indigenous
Poaceae	<i>Eragrostis nindensis</i>	Indigenous
Poaceae	<i>Chloris virgata</i>	Indigenous
Orchidaceae	<i>Disperis macowanii</i>	Indigenous
Fabaceae	<i>Crotalaria damarensis</i>	Indigenous
Anacardiaceae	<i>Searsia ciliata</i>	Indigenous
Malvaceae	<i>Abutilon austro-africanum</i>	Indigenous
Fabaceae	<i>Leobordea platycarpa</i>	Indigenous
Poaceae	<i>Panicum gilvum</i>	Indigenous
Fabaceae	<i>Melolobium canescens</i>	Indigenous
Fabaceae	<i>Tephrosia dregeana</i> var. <i>dregeana</i>	Indigenous
Asteraceae	<i>Cineraria lyratiformis</i>	Indigenous
Apocynaceae	<i>Stapelia olivacea</i>	Indigenous; Endemic
Acanthaceae	<i>Barleria macrostegia</i>	Indigenous
Asteraceae	<i>Verbesina encelioides</i> subsp. <i>encelioides</i>	Not indigenous; Naturalised; Invasive
Poaceae	<i>Melinis nerviglumis</i>	Indigenous
Hyacinthaceae	<i>Dipcadi platyphyllum</i>	Indigenous
Cucurbitaceae	<i>Zehneria scabra</i> subsp. <i>scabra</i>	Indigenous
Apocynaceae	<i>Piarranthus decipiens</i>	Indigenous
Poaceae	<i>Eragrostis lehmanniana</i> var. <i>lehmanniana</i>	Indigenous
Poaceae	<i>Digitaria eriantha</i>	Indigenous
Asteraceae	<i>Helichrysum cerastioides</i> var. <i>cerastioides</i>	Indigenous
Colchicaceae	<i>Colchicum melanthioides</i> subsp. <i>melanthioides</i>	Indigenous
Limeaceae	<i>Limeum viscosum</i> subsp. <i>transvaalense</i>	Indigenous; Endemic
Anacardiaceae	<i>Searsia tridactyla</i>	Indigenous; Endemic
Malvaceae	<i>Waltheria indica</i>	Indigenous
Poaceae	<i>Stipagrostis uniplumis</i> var. <i>uniplumis</i>	Indigenous

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Family	Species Name	Ecology
Fabaceae	<i>Vachellia hebeclada subsp. hebeclada</i>	Indigenous
Asteraceae	<i>Dicoma macrocephala</i>	Indigenous
Amaranthaceae	<i>Sericorema remotiflora</i>	Indigenous
Fabaceae	<i>Vachellia erioloba</i>	Indigenous
Solanaceae	<i>Lycium hirsutum</i>	Indigenous
Euphorbiaceae	<i>Croton gratissimus var. gratissimus</i>	Indigenous
Malvaceae	<i>Hibiscus trionum</i>	Not indigenous; Naturalised
Acanthaceae	<i>Justicia thymifolia</i>	Indigenous; Endemic
Asparagaceae	<i>Asparagus suaveolens</i>	Indigenous
Convolvulaceae	<i>Evolvulus alsinoides</i>	Indigenous
Peraceae	<i>Clutia affinis</i>	Indigenous
Iridaceae	<i>Babiana bainesii</i>	Indigenous
Malvaceae	<i>Grewia flava</i>	Indigenous
Cucurbitaceae	<i>Cucumis heptadactylus</i>	Indigenous; Endemic
Hyacinthaceae	<i>Albuca virens subsp. arida</i>	Indigenous
Ricciaceae	<i>Riccia cavernosa</i>	Indigenous
Asteraceae	<i>Ifloga glomerata</i>	Indigenous
Talinaceae	<i>Talinum caffrum</i>	Indigenous
Asteraceae	<i>Helichrysum pumilio subsp. pumilio</i>	Indigenous; Endemic
Asteraceae	<i>Helichrysum melanacme</i>	Indigenous
Fabaceae	<i>Melolobium calycinum</i>	Indigenous
Convolvulaceae	<i>Convolvulus sagittatus</i>	Indigenous
Verbenaceae	<i>Lantana rugosa</i>	Indigenous
Asteraceae	<i>Pentzia lanata</i>	Indigenous
Euphorbiaceae	<i>Euphorbia juttae</i>	Indigenous
Malvaceae	<i>Hermannia burkei</i>	Indigenous
Asteraceae	<i>Pentzia incana</i>	Indigenous
Asteraceae	<i>Pentzia globosa</i>	Indigenous
Poaceae	<i>Brachiaria nigropedata</i>	Indigenous
Asteraceae	<i>Pentzia viridis</i>	Indigenous; Endemic
Limeaceae	<i>Limeum myosotis var. myosotis</i>	Indigenous
Fabaceae	<i>Vachellia karroo</i>	Indigenous
Lamiaceae	<i>Ocimum americanum var. americanum</i>	Indigenous
Fabaceae	<i>Senna italica subsp. arachoides</i>	Indigenous
Poaceae	<i>Eragrostis pseudobtusata</i>	Indigenous; Endemic
Poaceae	<i>Antheplora pubescens</i>	Indigenous
Talinaceae	<i>Talinum crispatum</i>	Indigenous
Cyperaceae	<i>Cyperus marlothii</i>	Indigenous
Asphodelaceae	<i>Aloe hereroensis</i>	Indigenous
Solanaceae	<i>Solanum campylacanthum</i>	Indigenous

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Family	Species Name	Ecology
Cyperaceae	<i>Cyperus usitatus</i>	Indigenous
Amaranthaceae	<i>Chenopodium hederiforme</i> var. <i>undulatum</i>	Indigenous
Poaceae	<i>Aristida engleri</i> var. <i>engleri</i>	Indigenous
Polygalaceae	<i>Polygala leptophylla</i> var. <i>leptophylla</i>	Indigenous
Aizoaceae	<i>Mestoklema arboriforme</i>	Indigenous; Endemic
Acanthaceae	<i>Barleria bechuanensis</i>	Indigenous; Endemic
Poaceae	<i>Melinis repens</i> subsp. <i>repens</i>	Indigenous
Cucurbitaceae	<i>Coccinia sessilifolia</i>	Indigenous
Acanthaceae	<i>Justicia incana</i>	Indigenous
Poaceae	<i>Eragrostis trichophora</i>	Indigenous
Poaceae	<i>Aristida vestita</i>	Indigenous
Poaceae	<i>Schmidtia pappophoroides</i>	Indigenous
Poaceae	<i>Enneapogon scoparius</i>	Indigenous
Poaceae	<i>Cynodon incompletus</i>	Indigenous; Endemic
Poaceae	<i>Oropetium capense</i>	Indigenous
Euphorbiaceae	<i>Euphorbia avasmontana</i>	Indigenous
Euphorbiaceae	<i>Euphorbia inaequilatera</i>	Indigenous
Poaceae	<i>Aristida congesta</i> subsp. <i>congesta</i>	Indigenous
Campanulaceae	<i>Wahlenbergia</i> sp.	
Iridaceae	<i>Moraea pallida</i>	Indigenous
Fabaceae	<i>Indigofera hochstetteri</i> subsp. <i>streyana</i>	Indigenous
Malvaceae	<i>Melhania rehmannii</i>	Indigenous
Santalaceae	<i>Viscum rotundifolium</i>	Indigenous
Rubiaceae	<i>Anthospermum rigidum</i> subsp. <i>rigidum</i>	Indigenous
Poaceae	<i>Pogonarthria squarrosa</i>	Indigenous
Pteridaceae	<i>Cheilanthes hirta</i> var. <i>hirta</i>	Indigenous
Cucurbitaceae	<i>Kedrostis crassirostrata</i>	Indigenous
Asteraceae	<i>Felicia muricata</i> subsp. <i>cinerascens</i>	Indigenous
Limeaceae	<i>Limeum pterocarpum</i> var. <i>pterocarpum</i>	Indigenous
Asteraceae	<i>Felicia fascicularis</i>	Indigenous
Urticaceae	<i>Laportea peduncularis</i> subsp. <i>peduncularis</i>	Indigenous
Poaceae	<i>Digitaria seriata</i>	Indigenous
Asteraceae	<i>Arctotheca calendula</i>	Indigenous
Polygalaceae	<i>Muraltia alopecuroides</i>	Indigenous; Endemic
Asteraceae	<i>Eriocephalus ericoides</i> subsp. <i>griquensis</i>	Indigenous; Endemic
Asteraceae	<i>Tarchonanthus obovatus</i>	Indigenous; Endemic
Malvaceae	<i>Radyera urens</i>	Indigenous
Malvaceae	<i>Sida cordifolia</i> subsp. <i>cordifolia</i>	Indigenous
Fabaceae	<i>Ptychlobium biflorum</i> subsp. <i>biflorum</i>	Indigenous

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Family	Species Name	Ecology
Poaceae	<i>Tragus koelerioides</i>	Indigenous
Cucurbitaceae	<i>Momordica balsamina</i>	Indigenous
Asteraceae	<i>Arctotis leiocarpa</i>	Indigenous
Acanthaceae	<i>Justicia divaricata</i>	Indigenous
Scrophulariaceae	<i>Jamesbrittenia integerrima</i>	Indigenous
Asteraceae	<i>Tarchonanthus camphoratus</i>	Indigenous
Menispermaceae	<i>Cissampelos capensis</i>	Indigenous
Acanthaceae	<i>Justicia puberula</i>	Indigenous; Endemic
Pedaliaceae	<i>Sesamum capense</i>	Indigenous
Euphorbiaceae	<i>Euphorbia spartaria</i>	Indigenous
Asphodelaceae	<i>Bulbine narcissifolia</i>	Indigenous
Poaceae	<i>Eragrostis echinochloidea</i>	Indigenous
Fabaceae	<i>Indigofera rhytidocarpa</i> subsp. <i>rhytidocarpa</i>	Indigenous
Cyperaceae	<i>Cyperus vestitus</i>	Indigenous
Convolvulaceae	<i>Ipomoea oenotheroides</i>	Indigenous
Malvaceae	<i>Hermannia comosa</i>	Indigenous
Poaceae	<i>Eragrostis curvula</i>	Indigenous
Aizoaceae	<i>Trichodiadema pomeridianum</i>	Indigenous
Bignoniaceae	<i>Rhigozum brevispinosum</i>	Indigenous
Poaceae	<i>Aristida diffusa</i> subsp. <i>burkei</i>	Indigenous
Fabaceae	<i>Indigofera alternans</i> var. <i>alternans</i>	Indigenous
Poaceae	<i>Enneapogon scaber</i>	Indigenous
Boraginaceae	<i>Ehretia rigida</i> subsp. <i>rigida</i>	Indigenous; Endemic
Poaceae	<i>Microchloa caffra</i>	Indigenous
Amaranthaceae	<i>Salsola</i> sp.	
Poaceae	<i>Tragus berteronianus</i>	Indigenous
Gisekiaceae	<i>Gisekia africana</i> var. <i>africana</i>	Indigenous
Asteraceae	<i>Helichrysum zeyheri</i>	Indigenous
Poaceae	<i>Eragrostis porosa</i>	Indigenous
Fabaceae	<i>Cyamopsis serrata</i>	Indigenous
Fabaceae	<i>Listia heterophylla</i>	Indigenous
Asteraceae	<i>Hertia pallens</i>	Indigenous
Asteraceae	<i>Cichorium intybus</i> subsp. <i>intybus</i>	Not indigenous; Naturalised; Invasive
Convolvulaceae	<i>Ipomoea suffruticosa</i>	Indigenous
Asteraceae	<i>Metalasia trivialis</i>	Indigenous; Endemic
Fabaceae	<i>Melolobium humile</i>	Indigenous; Endemic
Asteraceae	<i>Dicoma anomala</i> subsp. <i>gerrardii</i>	Indigenous
Lamiaceae	<i>Salvia runcinata</i>	Indigenous
Amaranthaceae	<i>Aerva leucura</i>	Indigenous

Family	Species Name	Ecology
Cyperaceae	<i>Cyperus fulgens</i>	Indigenous
Asteraceae	<i>Felicia muricata subsp. muricata</i>	Indigenous
Acanthaceae	<i>Barleria rigida var. rigida</i>	Indigenous
Rhamnaceae	<i>Helinus spartioides</i>	Indigenous
Asteraceae	<i>Senecio consanguineus</i>	Indigenous
Lamiaceae	<i>Salvia verbenaca</i>	Not indigenous; Naturalised; Invasive
Malvaceae	<i>Hermannia vestita</i>	Indigenous
Amaranthaceae	<i>Dysphania carinata</i>	Not indigenous; Naturalised; Invasive
Thymelaeaceae	<i>Lasiosiphon kraussianus</i>	Indigenous
Ebenaceae	<i>Euclea undulata</i>	Indigenous
Ruscaceae	<i>Sansevieria aethiopica</i>	Indigenous

### 7.3 Fauna

A desktop assessment was performed with the aid of The Animal Demographic Unit Virtual Museum (ADU) and South African Bird Atlas Project 2 (SABAP 2). The study identified avifaunal species that may occur within the study area. It must be noted that the desktop study presents data over the entire Quarter Degree Square (QDS) 22722DD and 2723CC and is not limited to the study area. Table 7-4 presents bird species that are of ecological significance that may occur within the project area. A full list of potential bird species may be made available on request.

**Table 7-4: The possible ecologically significant bird species**

Common name	Species name	Conservation Status
Bustard, Kori	<i>Ardeotis kori</i>	VU
Eagle, Martial	<i>Polemaetus bellicosus</i>	VU
Eagle, Tawny	<i>Aquila rapax</i>	VU
Falcon, Lanner	<i>Falco biarmicus</i>	NT
Marsh-harrier, African	<i>Circus ranivorus</i>	VU
Oxpecker, Red-billed	<i>Buphagus erythrorhynchus</i>	NT
Secretarybird, Secretarybird	<i>Sagittarius serpentarius</i>	NT
Stork, Yellow-billed	<i>Mycteria ibis</i>	NT
Vulture, Cape	<i>Gyps coprotheres</i>	VU
Vulture, Lappet-faced	<i>Torgos tracheliotus</i>	VU
Vulture, White-backed	<i>Gyps africanus</i>	VU

The possible faunal species identified and presented in Table 7-5, Table 7-6 and Table 7-7 represents desktop data. The data presents the faunal species that may be identified within the project area in its natural and unmodified state. The species that are of ecological significance are presented in bold in the table. It must be noted that species presented in these tables are species that have not been reported in the area after the year 2010.

**Table 7-5: Mammal species that may occur within project area (ADU, 2022)**

Family	Scientific name	Common name	Conservation Status
Leporidae	<i>Lepus capensis</i>	Cape Hare	Least Concern
Muridae	<i>Aethomys namaquensis</i>	Namaqua Rock Mouse	Least Concern
Muridae	<i>Gerbilliscus leucogaster</i>	Bushveld Gerbil	Least Concern (2016)
Muridae	<i>Rhabdomys pumilio</i>	Xeric Four-striped Grass Rat	Least Concern (2016)
Nesomyidae	<i>Saccostomus campestris</i>	Southern African Pouched Mouse	Least Concern (2016)
Nycteridae	<i>Nycteris thebaica</i>	Egyptian Slit-faced Bat	Least Concern (2016)
Rhinolophidae	<i>Rhinolophus clivosus</i>	Geoffroy's Horseshoe Bat	Least Concern (2016)
Rhinolophidae	<i>Rhinolophus denti</i>	Dent's Horseshoe Bat	Near Threatened (2016)
Sciuridae	<i>Xerus inauris</i>	South African Ground Squirrel	Least Concern
Vespertilionidae	<i>Neoromicia capensis</i>	Cape Serotine	Least Concern (2016)

**Table 7-6: Amphibian species that may occur within project area (ADU, 2022)**

Family	Scientific name	Common name	Conservation Status
Bufoidea	<i>Sclerophrys gutturalis</i>	Guttural Toad	Least Concern (IUCN, 2016)
Hyperoliidae	<i>Kassina senegalensis</i>	Bubbling Kassina	Least Concern

**Table 7-7: Reptile species that may occur within project area (ADU, 2022)**

Family	Scientific name	Common name	Conservation Status
Colubridae	<i>Telescopus semiannulatus</i>	Eastern Tiger Snake	Least Concern (SARCA 2014)
Lamprophiidae	<i>Atractaspis bibronii</i>	Bibron's Stiletto Snake	Least Concern (SARCA 2014)
Lamprophiidae	<i>Boaedon capensis</i>	Brown House Snake	Least Concern (SARCA 2014)

## 7.4 National Biodiversity Assessment

### 7.4.1 National Wetlands Map 5

The National Wetland Map 5 includes inland wetlands and estuaries, associated with river line data and many other data sets within the South African Inventory of Inland Aquatic Ecosystems (SAIIAE) 2018. Mapping the locality of wetlands is essential so that they may be classified into the different wetland ecosystem types across the country, which in turn can be used along with other data to identify wetlands of conservation significance. There no wetland areas of the NWP5 identified within the project area are presented in Figure 7-2.



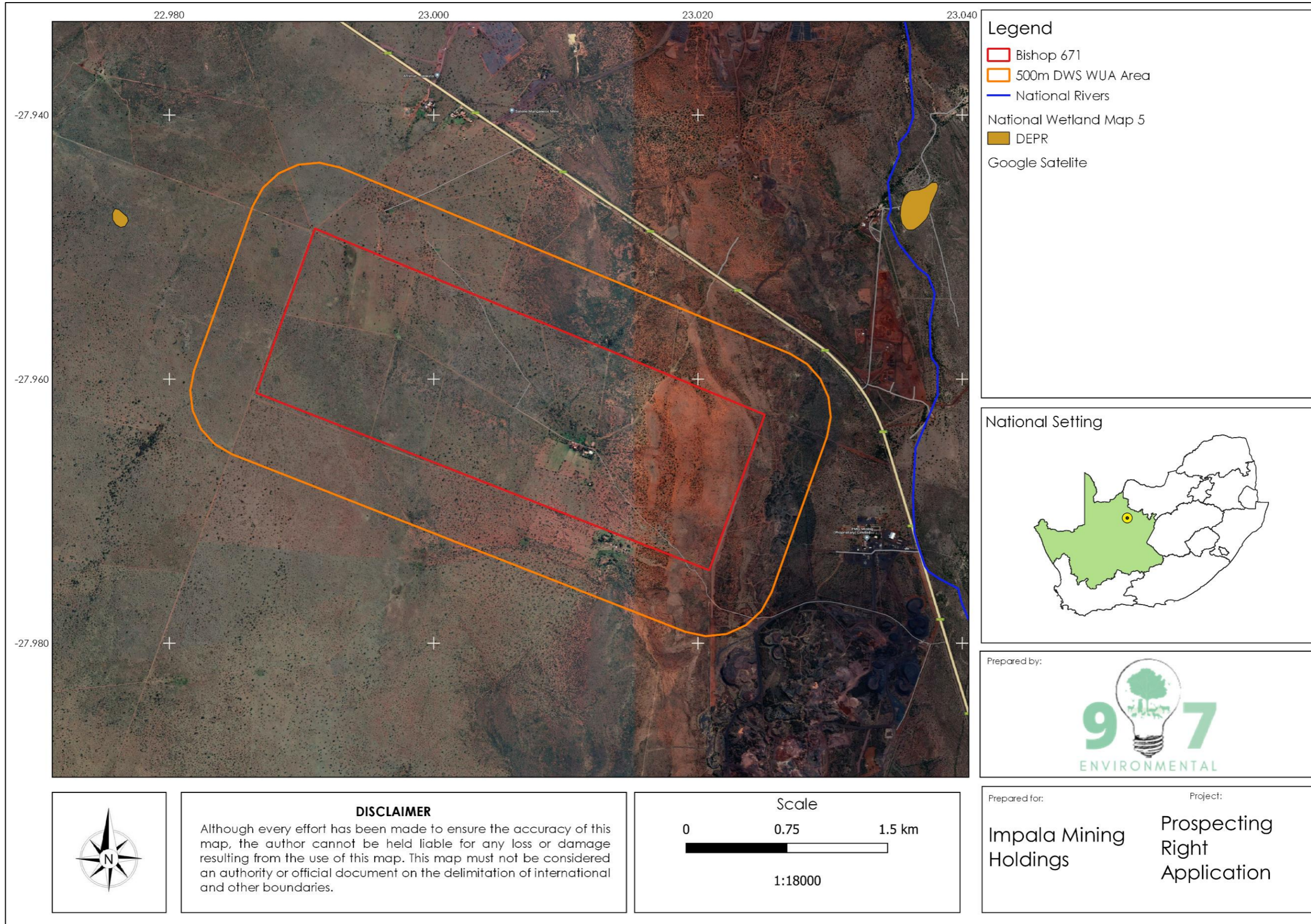


Figure 7-2: The National Wetland Map 5 areas associated with the proposed project



### **7.4.2 Ecosystem Status**

The remaining natural ecosystems within the project area, were considered as Least Concern (LC) as seen in Figure 7-3. The state of the ecosystems indicated that these ecosystems are not in a threatened state and are likely to remain largely intact. However, the protection of the ecosystems within the project area is poorly protected or not protected at all (Figure 7-4) which indicates that there are no means to conserve this habitat and could lead to increased threat in future.



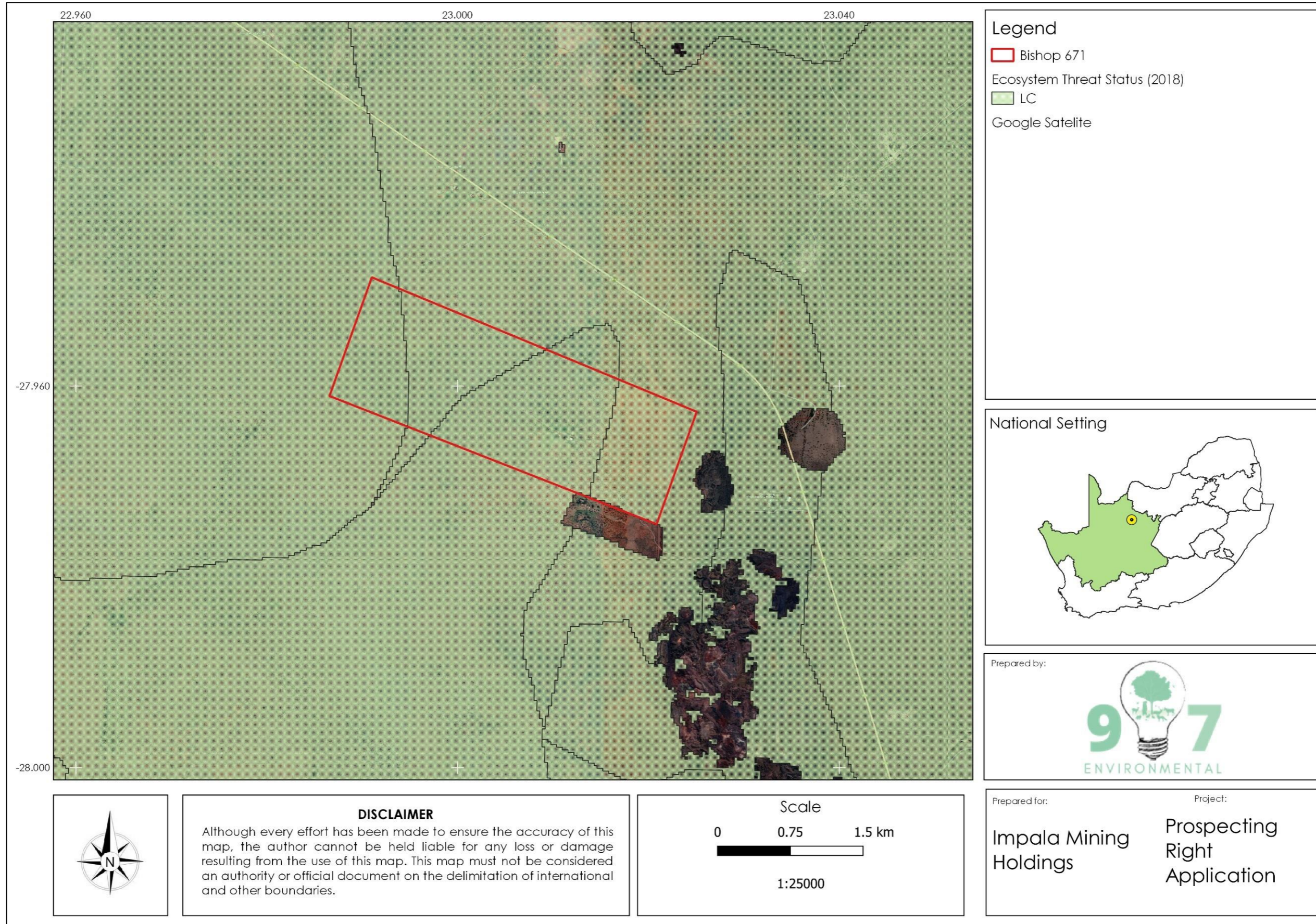


Figure 7-3: Threat status of ecosystems within the project area



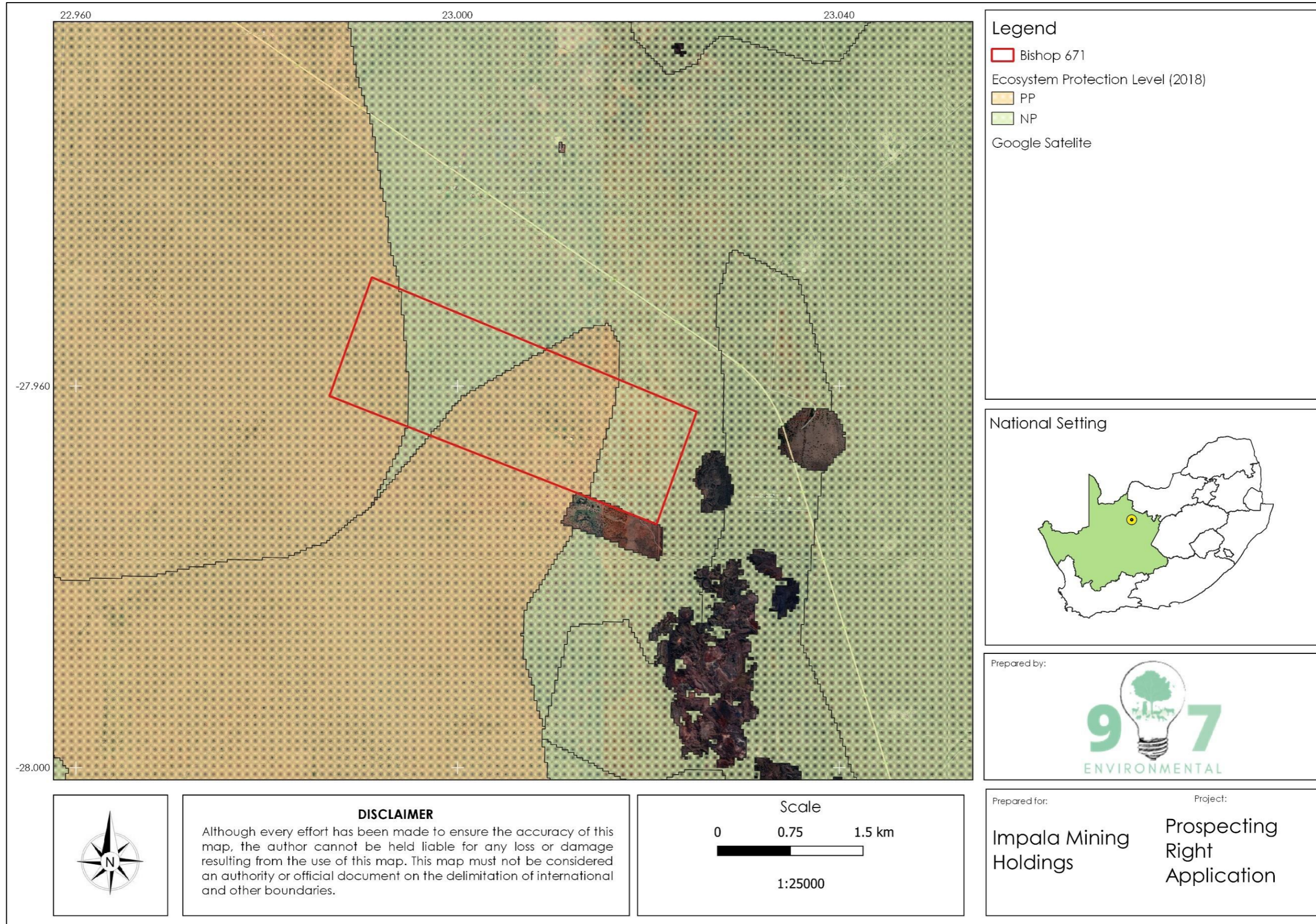


Figure 7-4: Protection status of ecosystems within the project area



### **7.5 Important Bird Areas**

The project area was determined to be over 10km from any identified Important Bird Area.

### **7.6 Protected Areas**

Protected areas are areas of conservation importance and are gazetted as proclaimed nature reserves. These areas are protected as they provide safe areas of fauna and flora species. The proposed project was identified to be over 10km from any protected area.

### **7.7 Northern Cape Conservation Plan (2016)**

The Northern Cape Conservation Plan identifies areas of ecological importance within the Northern Cape Province. The majority of the project area is classified as Other Natural Areas with a small portion to the east classified as an Ecological Support Area as presented in Figure 7-5. This indicates that although the project area is considered natural, there are no sensitive habitats expected within the project area.



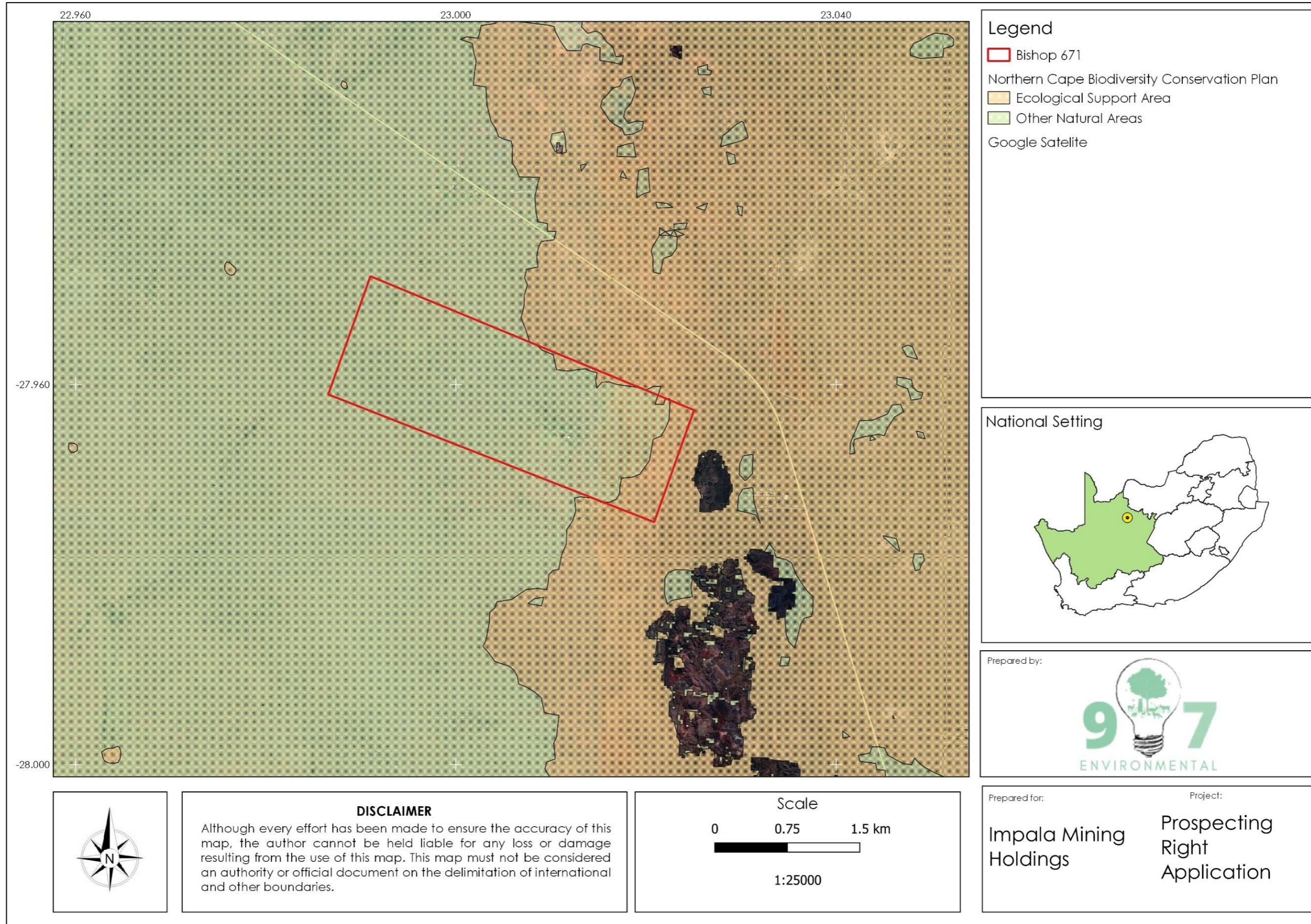


Figure 7-5: The Northern Cape Conservation Plan areas within the project area



## 7.8 Land Uses

The land uses identified within the project area are predominantly cultivated lands (Figure 7-6) which indicates that there is some agricultural activity within the project area and surrounding areas. It is anticipated that much of the project area has been transformed to cultivated lands or game farming based on latest available imagery.



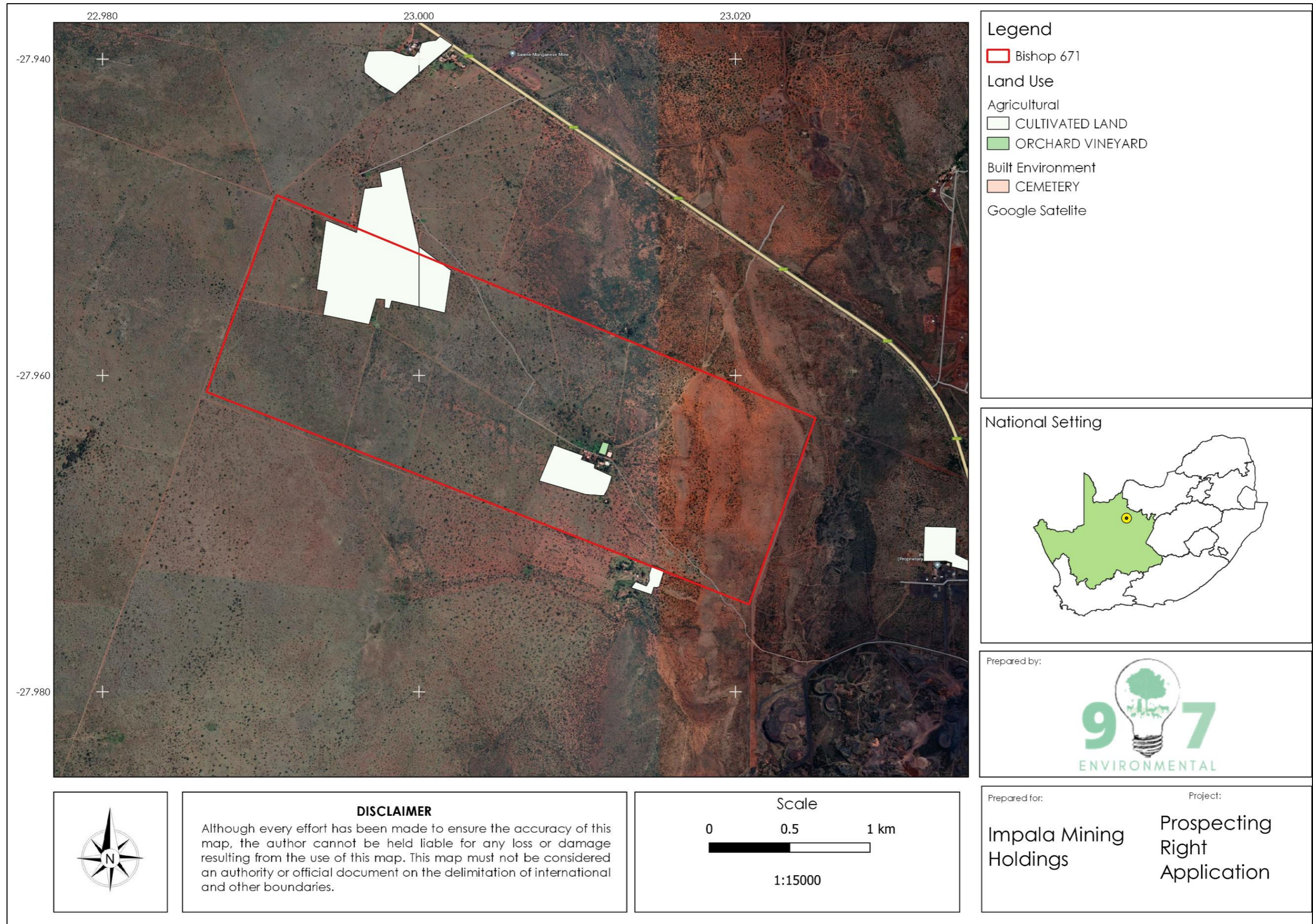


Figure 7-6: Land uses identified within the project area



## 8 Impact Assessment

### 8.1 Potential Impacts

Impacts of the proposed project will predominantly impact on the vegetation and water resources within the project area. Potential impacts are listed below; it must be noted that these are potential impacts based on general activities.

Potential impacts were evaluated against the data captured during the fieldwork to identify relevance to the study area. The relevant impacts were then subjected to a prescribed impact assessment methodology which is described below.

Impacts were assessed in terms of the construction and operational phases. The operational phase includes the maintenance of the transformers. It is assumed that the proposed project will not have a decommissioning phase.

Mitigation measures were only applied to impacts deemed relevant based on the impact analysis. The likelihood and consequence descriptors are presented in Table 8-1 and Table 8-2. The significance rating matrix is presented in Table 8-3.

**Table 8-1: Likelihood descriptors**

Probability of impact	Rating
Highly unlikely	1
Possible	2
Likely	3
Highly likely	4
Definite	5
Sensitivity of receiving environment	Rating
Ecology not sensitive/important	1
Ecology with limited sensitivity/importance	2
Ecology moderately sensitive/ /important	3
Ecology highly sensitive /important	4
Ecology critically sensitive /important	5

**Table 8-2: Consequence Descriptors**

Severity of impact	Rating
Insignificant / ecosystem structure and function unchanged	1
Small / ecosystem structure and function largely unchanged	2
Significant / ecosystem structure and function moderately altered	3
Great / harmful/ ecosystem structure and function largely altered	4



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Disastrous / ecosystem structure and function seriously to critically altered	5
<b>Spatial scope of impact</b>	<b>Rating</b>
Activity specific/ < 5 ha impacted / Linear features affected < 100m	1
Development specific/ within the site boundary / < 100 ha impacted / Linear features affected < 100m	2
Local area/ within 1 km of the site boundary / < 5000ha impacted / Linear features affected < 1000m	3
Regional within 5 km of the site boundary / < 2000ha impacted / Linear features affected < 3000m	4
Entire habitat unit / Entire system/ > 2000ha impacted / Linear features affected > 3000m	5
<b>Duration of impact</b>	<b>Rating</b>
One day to one month: Temporary	1
One month to one year: Short Term	2
One year to five years: Medium Term	3
Life of operation or less than 20 years: Long Term	4
Permanent	5

**Table 8-3: Significance Rating Matrix**

		CONSEQUENCE (Severity + Spatial Scope + Duration)														
		0	2	3	4	5	6	7	8	9	10	11	12	13	14	15
LIKELIHOOD (Frequency of activity + Frequency of impact)	2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	
	3	6	9	12	15	18	21	24	27	30	33	36	39	42	45	
	4	8	12	16	20	24	28	32	36	40	44	48	52	56	60	
	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	
	6	12	18	24	30	36	42	48	54	60	66	72	78	84	90	
	7	14	21	28	35	42	49	56	63	70	77	84	91	98	105	
	8	16	24	32	40	48	56	64	72	80	88	96	104	112	120	
	9	18	27	36	45	54	63	72	81	90	99	108	117	126	135	
	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	

Impacts of the proposed project will predominantly impact on the vegetation water resources within the project area. Potential impacts are listed in ; it must be noted that these are potential impacts based on a desktop assessment and general activities

**Table 8-4: Impacts identified for the proposed project**

	Impact	Impact Causing Aspect
Con struc	Disturbance/Loss of Vegetation and protected plant	Removal of vegetation
		Stripping and stockpiling of top soil

	Impact	Impact Causing Aspect	
		Compaction project area	
		Drilling activities	
		Site access	
	Loss of Habitat		Removal of vegetation
			Drilling activities
			Establishment of working area
			Day to day operations
			Clearing of areas for infrastructure
	Loss/Disturbance of Watercourse		Impeding the flow of water.
			Loss of wetland (excavation)
			Erosion of watercourse.
			Sedimentation of the watercourse
	Operational Phase	Disturbance/Loss of Vegetation	Additional Associated Infrastructure
Operation of equipment and machinery			
Vehicle activity			
Domestic and industrial waste			
Storage of chemicals, mixes and fuel			
Spills and leaks			
Habitat Fragmentation			Operation of machinery/Noise
			Human activity
			Traffic / vehicle activity
Loss/Disturbance of Watercourse			Impeding the flow of water.
			Contamination of watercourse
			Erosion of watercourse.
			Sedimentation of the watercourse
	Drainage of wetland areas		
	Domestic and industrial waste		
	Storage of chemicals, mixes and fuel		
Spills and leaks			

### 8.1.1 Potential Impacts to Vegetation Communities

The following potential impacts were considered on terrestrial vegetation communities:

- ❖ Loss destruction and/or eradication of plant species of conservation concern/ importance; and

### **8.1.2 Potential Impacts to Faunal Communities**

The following potential impacts on faunal communities were considered in this assessment:

- ❖ Loss and/or displacement of faunal species of conservation concern; and
- ❖ Loss of diversity of indigenous faunal communities.
- ❖ Loss of aquatic habitat.

## **8.2 Assessment of Significance**

### **8.2.1 Significance of Impacts on Vegetation Communities**

Table 8-5 shows the significance of potential impacts associated with the proposed developments on vegetation communities. Prior to implementation of mitigation measures the significance of the impact was rated as moderately high. This is attributed to the largely natural state of the vegetation within the project area. Although the vegetation has been altered, the project area falls within endangered and vulnerable vegetation units and as such poses a moderately high impact.

### **8.2.2 Significance of Impacts on Faunal Communities**

The significance assessment of potential impacts associated with the development on the faunal communities is presented in Table 8-6. Prior to implementation of mitigation measures both impacts were rated as moderate. This was attributed to the degree of disturbance observed on the site and the low likelihood of species of conservation concern occurring on the site.

**Table 8-5: Assessment of significance of potential impacts on vegetation communities associated with the proposed project**

Impact	Prior to mitigation							
	Duration of Impact	Spatial Scope	Sensitivity of Receiving Environment	Severity of Impact	Probability of Impact	Consequence	Likelihood	Significance
Loss destruction and/or eradication of plant species of conservation concern/ importance	5	3	2	4	4	10	8	80
	Permanent	Local area	Ecology with limited sensitivity/importance	Small	Possible			<b>Moderately High</b>

**Table 8-6: Assessment of significance of potential impacts on faunal communities associated with the proposed project**

Impact	Prior to mitigation							
	Duration of Impact	Spatial Scope	Sensitivity of Receiving Environment	Severity of Impact	Probability of Impact	Consequence	Likelihood	Significance
Loss and/or displacement of faunal species of conservation concern	5	3	2	3	4	10	7	70
	Permanent	Local area	Ecology with limited sensitivity	Small	Possible			<b>Moderate</b>
Loss of diversity of indigenous faunal communities	5	3	2	3	4	10	7	70
	Permanent	Local area	Ecology with limited sensitivity	Small	Possible			<b>Moderate</b>

The impacts identified for the proposed project were related to the habitats and vegetation units in the project area. It is expected that impacts to terrestrial fauna will be moderate as animals are able to migrate and with the current forestry practices, faunal activity is expected to be limited. The impacts to the vegetation are expected to be moderately high as the project proposes to mine and/or develop on the whole project area.

The impacts were not determined after mitigation as there was not a development plan or activities list made available. The impacts remain moderate to high for the proposed prospecting development.

### 8.3 Water Resources Buffer Requirement

Although there were no wetland identified within the project area, the Buffer Zone Tool was utilised to calculate a desktop buffer zone for the watercourse in the project area as this is a desktop assessment. Table 8-7 presents the risk associated with the proposed prospecting and the recommended desktop buffer zone to protect watercourse areas.

**Table 8-7: Buffer zone determination**

Threat Posed by the proposed land use / activity		Desktop Threat Rating
Construction Phase	1. Alteration to flow volumes	N/A
	2. Alteration of patterns of flows (increased flood peaks)	VL
	3. Increase in sediment inputs & turbidity	H
	4. Increased nutrient inputs	N/A
	5. Inputs of toxic organic contaminants	N/A
	6. Inputs of toxic heavy metal contaminants	L
	7. Alteration of acidity (pH)	N/A
	8. Increased inputs of salts (salinization)	N/A
	9. Change (elevation) of water temperature	VL
	10. Pathogen inputs (i.e. disease-causing organisms)	VL
Operational Phase	1. Alteration to flow volumes	L
	2. Alteration of patterns of flows (increased flood peaks)	L
	3. Increase in sediment inputs & turbidity	L
	4. Increased nutrient inputs	L
	5. Inputs of toxic organic contaminants	L
	6. Inputs of toxic heavy metal contaminants	M
	7. Alteration of acidity (pH)	L
	8. Increased inputs of salts (salinization)	L
	9. Change (elevation) of water temperature	L
	10. Pathogen inputs (i.e. disease-causing organisms)	VL
<b>Desktop buffer requirement (m)</b>		<b>80</b>

## 9 Recommendations

Taking into consideration the limitations of the project, the following recommendations are provided:

- ❖ A 150m buffer zone must be applied to all watercourse areas and must be considered a no-go zone. The Buffer Tool recommends an 80m buffer zone; however, this buffer is based on a desktop delineation and as such may not cater for the slopes, land cover and landuses;
- ❖ A full ecological survey must be conducted during the EIA phase of the project; and
- ❖ The impact assessment must make use of ecological data to make informed decisions and infrastructure planning.

### 9.1 Mitigation Measures

The following are mitigation measures to be applied before commencement of the project:

- ❖ The water resources within the project site area must be avoided where possible;
- ❖ The construction vehicles and machinery must make use of existing access routes as much as possible, before adjacent areas are considered for access;
- ❖ Laydown yards, camps and storage areas must be beyond the water resources and buffer zones. Where possible, the construction of the road and crossings must take place from the existing road and not from within the watercourse;
- ❖ The contractors used for the project should have action plans on site, spill kits and training to ensure that any fuel or oil spills are clean-up and discarded correctly;
- ❖ It is preferable that construction takes place during the dry season to reduce the erosion potential of the exposed surfaces;
- ❖ Prevent uncontrolled access of vehicles through the watercourses that can cause a significant adverse impact on the hydrology and soil structure of these areas;
- ❖ All chemicals and toxicants to be used for the road construction must be stored outside the water resources and in a bunded area;
- ❖ All machinery and equipment should be inspected regularly for faults and possible leaks, these should be serviced off-site;
- ❖ All contractors and employees should undergo induction which is to include a component of environmental awareness. The induction is to include aspects such as the need to avoid littering, the reporting and cleaning of spills and leaks and general good "housekeeping";
- ❖ Adequate sanitary facilities and ablutions on the servitude must be provided for all personnel throughout the project area. Use of these facilities must be enforced (these facilities must be kept clean so that they are a desired alternative to the surrounding vegetation);

- ❖ All removed soil and material must not be stockpiled within the system. Stockpiling should take place outside of the watercourse. All stockpiles must be protected from erosion, stored on flat areas where run-off will be minimised, and be surrounded by bunds;
- ❖ Erosion and sedimentation into the channel must be minimised through the effective stabilisation (gabions and Reno mattresses) and the re-vegetation of any disturbed banks;
- ❖ Any exposed earth should be rehabilitated promptly by planting suitable vegetation (vigorous indigenous grasses) to protect the exposed soil;
- ❖ No dumping of construction material on-site may take place; and
- ❖ All waste generated on-site during construction must be adequately managed. Separation and recycling of different waste materials should be supported.

## 10 Opinion of the Specialist

An impact statement is required as per the NEMA regulations with regards to the proposed development.

It is the opinion of the specialist that the proposed project be authorised provided that all mitigation measures are implemented, and the following conditions be included in the environmental authorisation for this project:

### 10.1 Conditions for Environmental Authorisation

- ❖ Any water resource areas and 80m buffer zones must be avoided for the duration of the project and all the proposed activities and secondary activities must be outside the wetland and buffer zones;
- ❖ An Environmental Control Officer (ECO) must be appointed and be present for the duration of prospecting period; and
- ❖ A rehabilitation plan must be compiled and implemented for the for all phases of the project. The rehabilitation plan must make provision for the rehabilitation and/or remediation of wetland areas and include an action plan (emergencies) for environmental hazards.

## 11 Conclusion

The majority of the project area is considered as largely natural; however, not sensitive. The ecosystems within the project area, were considered as Least Concern (LC). However, the protection of the ecosystems within the project area is poor to none which indicates very little active protection of the ecosystems which could lead to losses in future.

The impacts identified for the proposed project were related to the habitats and vegetation units. It is expected that impacts to terrestrial fauna will be moderate. The impacts to the vegetation are expected to be moderately high as the project proposes to mine and/or develop on the whole project area.





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