



**DRAFT BASIC ASSESSMENT REPORT AND
ENVIRONMENTAL MANAGEMENT PROGRAMME**

FOR

MOLOBEDU MAKOWENI (PTY) LTD

**PROSPECTING RIGHT APPLICATION FOR COAL ON FARM LOT 289
EMPANGENI 13389 GU, AND LOT 285 EMPANGENI 13400 GU, SITUATED IN
KING CETSHWAYO DISTRICT, KWA-ZULU NATAL PROVINCE**

REFERENCE NUMBER: KZN 30/5/1/1/2/ 12129 PR

Prepared by:

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IMPORTANT NOTICE

In terms of the Mineral and Petroleum Resources Development Act (Act 28 of 2002 as amended), the Minister must grant a prospecting or mining right if among others the mining “will not result in unacceptable pollution, ecological degradation or damage to the environment”.

Unless an Environmental Authorisation can be granted following the evaluation of an Environmental Impact Assessment and an Environmental Management Programme report in terms of the National Environmental Management Act (Act 107 of 1998) (NEMA), it cannot be concluded that the said activities will not result in unacceptable pollution, ecological degradation, or damage to the environment.

In terms of section 16(3)(b) of the EIA Regulations, 2014, any report submitted as part of an application must be prepared in a format that may be determined by the Competent Authority and in terms of section 17 (1) (c) the competent Authority must check whether the application has considered any minimum requirements applicable, or instructions or guidance provided by the competent authority to the submission of applications.

It is therefore an instruction that the prescribed reports required in respect of applications for an environmental authorisation for listed activities triggered by an application for a right or a permit are submitted in the exact format of, and provide all the information required in terms of, this template. Furthermore, please be advised that failure to submit the information required in the format provided in this template will be regarded as a failure to meet the requirements of the Regulation and will lead to the Environmental Authorisation being refused.

It is furthermore an instruction that the Environmental Assessment Practitioner must process and interpret his/her research and analysis and use the findings thereof to compile the information required herein. (Unprocessed supporting information may be attached as appendices). The EAP must ensure that the information required is placed correctly in the relevant sections of the Report, in the order, and under the provided headings as set out below, and ensure that the report is not cluttered with un-interpreted information and that it unambiguously represents the interpretation of the applicant.

OBJECTIVE OF THE BASIC ASSESSMENT PROCESS

The objective of the basic assessment process is to, through a consultative process—

- (a) Determine the policy and legislative context within which the proposed activity is located and how the activity complies with and responds to the policy and legislative context.
- (b) Identify the alternatives considered, including the activity, location, and technology alternatives.
- (c) Describe the need and desirability of the proposed alternatives,
- (d) Through the undertaking of an impact and risk assessment process inclusive of cumulative impacts which focused on determining the geographical, physical, biological, social, economic, heritage, and cultural sensitivity of the sites and locations within sites and the risk of impact of the proposed activity and technology alternatives on these aspects to determine:
 - (i) The nature, significance, consequence, extent, duration, and probability of the impacts occurring to; and
 - (ii) The degree to which these impacts—
 - (aa) Can be reversed.
 - (bb) May cause irreplaceable loss of resources; and
 - (cc) Can be managed, avoided, or mitigated.
- (e) Through a ranking of the site sensitivities and possible impacts the activity and technology alternatives will impose on the sites and location identified through the life of the activity to—
 - (i) Identify and motivate a preferred site, activity, and technology alternative.
 - (ii) Identify suitable measures to manage, avoid or mitigate identified impacts; and
 - (iii) Identify residual risks that need to be managed and monitored

LIST OF ABBREVIATIONS

BAR	Basic Assessment Report
BID	Background Information Document
CARA	Conservation of Agricultural Resources Act (Act No. 43 OF 1983)
CBA	Critical Biodiversity Area
CRR	Comments and Responses Report
DEA	Department of Environmental Affairs
DMPR	Department of Mineral and Petroleum Resource
DFFE	Department of Forestry, Fisheries, and the Environment (DFFE)
EA	Environmental Authorization
EAP	Environmental Assessment Practitioner
ECA	Environmental Conservation Act, 1989 (Act No. 73 of 1989)
ECO	Environmental Control Officer
EIA	Environmental Impact Assessment
EMPr	Environmental Management Programme
ESA	Ecological Support Area
GDP	Gross Domestic Product
GIS	Geographic Information Systems
GNR	Government Notice Regulation
Ha	Hectares
I&APs	Interested and Affected Parties
Km	Kilometer's
MPRDA	Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002)
NAAQS	National Ambient Air Quality Standards
NBA	National Biodiversity Assessment
NCR	Noise Control Regulations Act, 1989 (Act 73 of 1989)
NFEPA	National Freshwater Ecosystem Priority
NEM: AQUA	National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004)
NEM: BA	National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004)
NEM: WA	National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008)

	2008)
NEMA	National Environmental Management Act, 1998 (Act No. 107 of 1998)
NFEPA	National Freshwater Ecosystem Priority Area
NPA	National Protected Area
PPP	Public Participation Process
PR	Prospecting Right
PWP	Prospecting Work Programme
SAHRA	South African Heritage Resources Agency
SAHRIS	South African Heritage Resources Information System
SANS	South African National Standard (SANS) 10103
WMA	Water Management Area

EXECUTIVE SUMMARY

Molobedu Makoweni (Pty) Ltd, hereafter referred as 'the applicant' or 'Molobedu Makoweni' has applied for a prospecting right for coal in respect of Lot 289 Empangeni 13389 GU, Lot 285 Empangeni 13400 GU, situated in King Cetshwayo district, Kwa-Zulu Natal Province, for an extent area of is 1,160 ha. The prospecting area is situated 19 km North of Empangeni and 21 km West of KwaMbonambi town, using R34 access road.

The application for a prospecting right is in terms of Section 16 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) (as amended) (MPRDA), and therefore, an Environmental Impact Assessment (EIA) process is required to acquire an Environmental Authorisation in terms of Section 24 of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (as amended) (NEMA). Vahlegwe Mining Advisory and Consulting (Pty) Ltd, hereafter 'Vahlegwe' has been appointed by Molobedu Makoweni as an independent Environmental Assessment Practitioner (EAP) to facilitate the Environmental Authorisation (EA) processes for the proposed prospecting activities.

The competent authority for the environmental authorisation processes an environmental risk assessment to identify the significance of the impacts. The environmental impact assessment considered all phases of the project, including the site establishment, operational, rehabilitation and closure. The rating system used is applied to the potential impact on the receiving environment and includes an objective evaluation of the mitigation of the impact.

The stakeholder engagement process, as part of the Environmental Authorisation process will be conducted in terms of NEMA (as amended), which provides clear guidelines for stakeholder engagement during an EIA. Stakeholders will be afforded an opportunity to participate in the public review of the Draft BAR to ensure that the assessment of impacts and proposed management of impacts address their concerns. Comments received during the 30-day comment period (from the Draft BAR review) will be incorporated into this report, to be submitted to DMPR for decision-making.

Details of the Applicant.

Table 2: Details of the applicant

Name of Applicant:	Molobedu Makoweni (Pty) Ltd		
Registration number (if any):	2017/354919 /07		
Trading name (if any):	Molobedu Makoweni (Pty) Ltd		
Responsible Person : (E.g., CEO, Director, etc.)	Niel Van Zyl		
Contact person:	Niel Van Zyl		
Physical address:	Plot 1 AH, Sapfo Valtaki, Gauteng		
Postal address:	Plot 1 AH, Sapfo Valtaki, Gauteng		
Postal code:	1020	Cellphone:	+27 82 461 3787
Email:	neil@exicon.co.za vanzylp@gmail.com		

Environmental Consultants

Vahlangwe Mining Advisory and Consulting (Pty) Ltd is the appointed independent Environmental Assessment Practitioner (EAP) to undertake the Basic Assessment Process for the EA application for the proposed prospecting project.

Table 3: Details of the EAPs

Company name:	Vahlangwe Mining Advisory and Consulting (Pty) Ltd
Contact person:	Sunday M Mabaso
Physical address:	238 Voster Ave, Glenvista Extension 3, Johannesburg South, 2190
Telephone:	011 432 0062 / 074 569 7312
Email:	info@vahlangweadvisory.co.za sunday@vahlangweadvisory.co.za

Public Participation Process Methodology

A Public Participation Process (PPP) will be undertaken as required in terms of the EIA Regulations, 2014 (as amended), promulgated under NEMA. During the undertakings of the

PPP, the environmental and social impacts are investigated, and any stakeholder who is directly or indirectly affected by the project will be given an opportunity to comment, raise concerns and contribute to the assessment to ensure that local knowledge, needs, and values are understood and taken into consideration throughout the process.

The Draft Basic Assessment Report will be made available for public review and comment for a period of 30 days and all comments or concerns raised will be recorded and responded to in the Comments and Responses Report (CRR).

The following activities will be undertaken to announce the project and initiate the Basic Assessment process:

- A Background Information Document (BID) including an Interested and Affected Parties Registration Forms (IAPs) handed and distributed to various stakeholders including the I&As.
- A newspaper advertisement will be placed in the **Zululand Observer Newspaper on the 10th of April 2026.**
- Site notices will be erected at various places within the vicinity of the site.
- An electronic copy will be accessible and downloaded from the www.vahleNgweadvisory.co.za.

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SCOPE OF ASSESSMENT AND BASIC ASSESSMENT REPORT

1. Introduction

Molobedu Makoweni proposes to undertake coal prospecting activities in respect of Lot 289 Empangeni 13389 GU, Lot 285 Empangeni 13400 GU, situated in King Cetshwayo district, Kwa-Zulu Natal Province, for an extent area of is 1,160 ha. The prospecting area is situated 19 km North of Empangeni and 21 km West of KwaMbonambi town, using R34 access road.

The proposed prospecting activities will include non-invasive and invasive techniques. The planned invasive activities will cover an area of about 0.205 ha. The project entails the drilling of at least ten (10) boreholes to determine the mineral deposition, quantity, economic viability, and possibilities of the project leading to a viable mine. A 165mm diameter core drill will be used to drill the geological boreholes.

The prospecting activities will be undertaken in 2-5 phases for a total duration month 13 – month 48, thus five years with subject to renewal for and 3 years should the prospecting programme not be completed within the first term of granting.

2. Contact Person and correspondence address.

2.1 Details of the EAP

Table 1: Details of the EAP

Company name:	Vahlengwe Mining Advisory and Consulting (Pty) Ltd
Contact person:	Sunday Mabaso
Physical address:	238 Voster Ave, Glenvista Extension 3, Johannesburg South, 2190, Gauteng
Telephone:	+27 11 432 0062 (+27) 74 569 7312
Email:	info@vahlengweadvisory.co.za sunday@vahlengweadvisory.co.za

2.2. Expertise of the EAP

2.2.1 The qualifications of the EAP (with evidence as **Appendix 1**)

This section describes the EAP's qualifications and experience for the proposed Project. Appendix A contains the EAPs' curriculum vitae and degrees.

Table 4: Expertise of the EAP

NAME	Sunday M Mabaso
QUALIFICATIONS	MBA, Graduate Diploma Engineering: Mining, Certificate: Global Environmental Management, Postgrad Certificate: Climate Change and Energy Law, Certificate: Mine Closure and Rehabilitation, and ND: Mineral Resource Management.
RESPONSIBILITY ON PROJECT	Project Leader and Reviewer
PROFESSIONAL REGISTRATION	EAPASA (Reg. No. 2022/4485) SAIMM (709244) IAIAAsa (Reg 7442) LaRSSA
EXPERIENCE	Sunday Mabaso has been the Principal Consultant at Vahlangwe since May 2021, with over 30 years' experience in the mining industry including more than 20 years of service at the Department of Mineral Resources and Energy of which he served seven (7) years as a Regional Manager (3 years in Northern Cape and 4 years in Gauteng). He has acquired various qualifications in mining including Graduate Diploma in Engineering: Mining and Post Graduate Certificate in Climate Change and Energy Law from the University of the Witwatersrand, NHD: Mineral Resource Management from Technikon Witwatersrand, Certificate in Global Environmental Management from Technical University of Denmark and Certificate in Mine Closure and Rehabilitation with the University of Pretoria. His areas of expertise include Environmental Management, Mining Legislation, Mine Economics, and Social and Labour Plans. Sunday has published several academic papers, including "Legacy Gold Mine Sites & Dumps in the Witwatersrand: Challenges and Required Action" in the Journal of Natural Resources, Vol 14, 2023. https://doi.org/10.4236/nr.2023.145005. "Social and Environmental Challenges caused by Legacy Gold Mining in Johannesburg: Government's Action Plan". eBook: ISBN: 978-81-19491-53-7. DOI: 10.9734/bpi/npgees/v9/10672F and "The impact of gold mine closures and future planning for sustainable development in the Witwatersrand Goldfields" Mine Closure Conference 2025, 19-20 February 2025, The Southern Institute of Mining and Metallurgy: ISBN 9781-1-7764673-8-9
NAME	Khanyile Mgiba-Mutero

QUALIFICATIONS	Higher Certificate in Life and Environmental Science
RESPONSIBILITY ON PROJECT	Report Compiler
PROFESSIONAL REGISTRATION	Candidate EAP (Reg. No. 2025/19982) SACNASP Student (169444)
EXPERIENCE	Khanyile is an environmental consultant who has 3 years working experience in the Environmental Management field. She has a University of South Africa Higher Certificate in Life and Environmental Science and is currently doing her BA in Environmental Management final Level at the University of South Africa (UNISA). She has performed environmental assessments (BAR), Scoping Report, Water Use Licence Application (WULA), Mine closure applications, and environmental compliance auditing. Her core competencies include research and report writing.

3. Location of the overall Activity

Table 5: Details of the overall activity location

Farm Name:	Situated in the Farm Lot 289 Empangeni 13389 GU, Lot 285 Empangeni 13400 GU.
Application area (Ha)	1,160 ha
Magisterial district:	King Cetshwayo district, Kwa-Zulu Natal.
Distance and direction from nearest town	The prospecting area is situated 19 km North of Empangeni and 21 km West of KwaMbonambi town, using R34 access road.
21-digit Surveyor General Code for each farm portion	N0GU00000001338900000 N0GU00000001340000000

4. Locality map

Attach a locality map at a scale not smaller than 1:250000 showing the nearest town and attach as **Appendix 2**

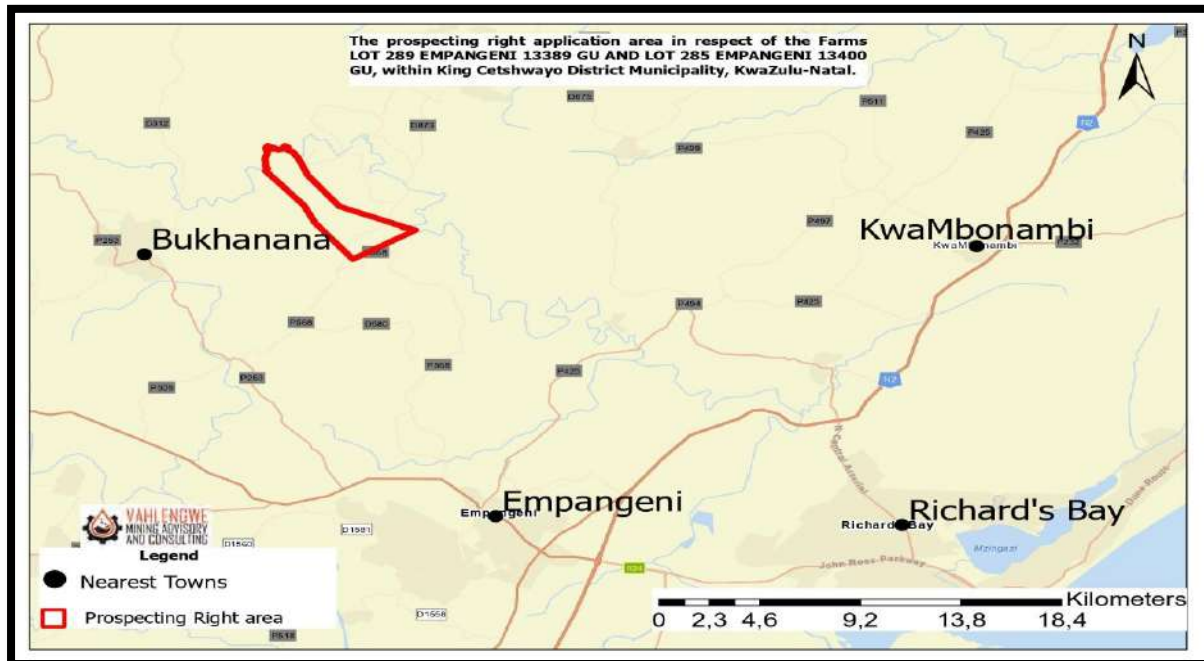


Figure 1: Locality map of the proposed area.

5. Description of the scope of the proposed overall activity

Attach a plan drawn to a scale acceptable to the competent authority but not less than 1: 10 000 that shows the location, and area (hectares) of all the aforesaid main and listed activities, and infrastructure to be placed on site.

Molobedu Makoweni proposes to undertake coal prospecting activities in respect of the farm situated in Lot 289 Empangeni 13389 GU, Lot 285 Empangeni 13400 GU, in the Magisterial District of King Cetshwayo, KwaZulu-Natal Province. The planned invasive prospecting activities will cover an area of at least 0.205 ha. The project entails the drilling of about ten (10) boreholes to determine the mineral deposition, quantity, economic viability, and possibilities of the project leading to a viable mine. Access to the prospecting area will be through existing roads.

5.1. Listed and specified activities

Table 6: Listed and specified activities

NAME OF ACTIVITY	AERIAL EXTENT OF THE ACTIVITY (HA OR M ²)	APPLICABLE LISTING NOTICE <i>GNR 983, GNR 984 or GNR 985</i>
Prospecting Right application area	1160 ha	GNR 984 (as amended)
Planned invasive drilling 10 boreholes at a maximum depth of 20m with each borehole sump area of 10m length x 5m breath	0.2 ha	GNR 984 (as amended)

Site clearing (30m x 30m)	0.09 ha	Not Listed
Geophysical survey	1,160 ha	Not Listed
Geological field mapping	1,160 ha	Not Listed
Access roads (3m x 50m)	0.015 ha	Not listed

5.2. Description of the activities to be undertaken

(Describe Methodology or technology to be employed, including the type of commodity to be prospected/mined and for a linear activity, a description of the route of the activity).

The prospecting activities will include the following activities:

- **Establishment of the office and equipment storage site:**

The site will be cleared of vegetation and level where the mobile site offices will be installed. No topsoil will be removed for this activity. Vegetation clearance of an extent area of 30x30m will be undertaken for the establishment of the site camp offices and auxiliary equipment for the operation.

- **Installation of mobile offices and ablutions facilities.**

Mobile offices and portable ablutions will be installed on the established site.

- **Construction of temporal access road to the camp.**

Temporal access roads to the site camp and drill sites will be constructed within the proposed area. However, existing farm roads will be utilized as far as practicable.

- **Drilling; and**

Drilling of ten (10) boreholes will be undertaken using a grid drilling pattern.

- **Rehabilitation and closure.**

Concurrent rehabilitation of the drill holes will be conducted after each drilling is completed. The drill holes will be backfilled with material in their respective manner and the drilled hole to be closed with a cap. The final rehabilitation of the site will be conducted including the rehabilitation of the office and equipment storage site footprint, drill sites and access roads. The rehabilitation plan will be included within the EMP which forms part of this report to be submitted to the Department of Mineral and Petroleum Resources (DMPR).

Project Phases

The prospecting activities will be undertaken in four (4) phases for a total duration of about 48 months, thus five years with the subject of renewal for 3 years should the prospecting programme not be completed within the first term of granting. The prospecting phases will be

conducted as follows:

Phase 1

- Desktop Studies

A desktop study will be carried out to obtain all possible geological information and historical data of the proposed prospecting area. These include the review of published geological reports, data from the Council for Geoscience and relevant geological research within the proposed area.

- Reconnaissance Survey

A geological reconnaissance survey of the proposed area will be undertaken to assess the potential ore bodies and to comparatively evaluate the preferred ore. This survey will generally be carried out for examination of the general geological features and characteristics of a region.

- Geological Field Mapping

A geological field mapping will be conducted to obtain information about the surface lithologies and geological features and structures hence a geological map will be the outcome of this activity.

- Geophysical Survey

Information will need to be gathered from undiscovered hidden ore bodies below the surface. A field data will be obtained based on the principles and guidelines. A GPS will be used to record the data point locations, and no access roads will be constructed for this survey.

- RC/DC Drilling

Larger diameter borehole core drilling will enable the evaluation of both the physical continuity and the quality continuity of the ore deposits. The borehole core data will be used for structural evaluation, quality analyses, and geotechnical evaluation. For reliable resource evaluation, the core recovery shall be more than 95% within the mineral deposits, and all core recovery information shall be properly documented. The spacing of about 76 -110 mm diameter borehole core holes for geological studies depends on the mineral deposits. The spacing between boreholes shall be decreased appropriately where significant quality changes occur in structurally complex areas. Drilling will be undertaken to a sufficient depth to intersect the Daspoort and Silverton formations, which may require boreholes exceeding 50 meters in depth in certain areas.

- Concurrent Rehabilitation

After each borehole is completely drilled and does not show any occurrence, it will be fully rehabilitated. Rehabilitation will only be done by backfilling of material in their respective manner and closing the drilled hole with a cap.

Phase 2

- Core Logging

All drill holes will be logged every meter containing information such as hole location, depth and other geological structures encountered within the hole. Dust samples will be taken in sealed chip trays and safeguarded for future referencing. Portions of the drill chips representing the ore will be taken and placed in bags for analysis.

- Sample Analysis

All samples obtained from the drilling programme will be taken to the accredited laboratory for analysis and ore grade.

Phase 3

- Banking & Feasibility Studies

The outcome of the prospecting work will determine whether the project is viable or not. This phase will comprise of the following key aspects:

- Geological Modelling
- Mineral Resource Estimation

A mineral resource estimation will be conducted and compiled into a Mineral Resources and Reserves Statement to be signed by a competent person. The estimation will include the tonnages and quality of the mineral. Should the results prove positive, the preparations for mining right application and any other relevant applications will commence. More various technical personnel will be involved in the process. The skills cycle will include geology, mine engineering, mine surveying, metallurgy, legal and finance.

Phase 4

- Rehabilitation and closure

Final rehabilitation of the site will be conducted as the final phase of the prospecting activities and will be undertaken upon cessation of the project

6. Policy and Legislative Context

Table 7: Policy and Legislative context

Applicable legislation and guidelines used to compile the report	Reference where applied
<u>The Constitution of the Republic of South Africa, 1996</u> Under Section 24 of the Constitution of the Republic of South Africa, 1996 (Act No. 108 of 1996) it is clearly stated that: Everyone has the right to a) an environment that is not harmful to their health or well-being; and b) to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that - (i) Prevent pollution and ecological degradation. (ii) Promote conservation; and (iii) Secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.	Vahlangwe is undertaking an EIA process to identify and determine the potential impacts associated with the proposed prospecting activities. Mitigation measures recommended will aim to ensure that the potential impacts are managed to acceptable levels to support the rights as enshrined in the Constitution.
<u>National Environmental Management Act, 1998 (Act No. 107 of 1998) and EIA Regulations (as amended in 2021)</u> The Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA) (as amended) was set in place in accordance with Section 24 of the Constitution. Certain environmental principles under NEMA must be adhered to, to inform decision making for issues affecting the environment. Section 24 (1)(a) and (b) of NEMA state that: The potential impact on the environment and socio-economic conditions of activities that require	Activities associated with the proposed prospecting activities are identified as Listed Activities in Listing Notice 1, GNR 983 (as amended), Listing Activity No. 20 and therefore require Basic Environmental Impact Assessment.

authorization or permission by law, and which may significantly affect the environment, must be considered, investigated, and assessed prior to their implementation and reported to the organ of state charged by law with authorizing, permitting, or otherwise allowing the implementation of an activity. The EIA Regulation, 2014 was published under GN R 326 on 07 April 2017 (EIA Regulations) and came into effect on 07 April 2017. Together with the EIA Regulations, the Minister also published GN R 327 (Listing Notice No. 1), GN 325 (Listing Notice No. 2) and GN R 324 (Listing Notice No. 3) in terms of Sections 24(2) and 24D of the NEMA, as amended.	The proposed prospecting project triggers activities listed in Listing Notice 1 of the NEMA, and a Basic Assessment process in terms of NEMA Government Notice Regulation (GNR) 982 (as amended) is required.
<u>Mineral and Petroleum Resource Development Act, 2002 (Act No. 28 of 2002)</u> The Act makes provision for equitable access to and sustainable development of the nation's mineral and petroleum resources; and provides for matters connected therewith. Mineral and Petroleum Resource Development Act, 2002 (Act No. 28 of 2002): Mineral and Petroleum Resource Development Regulations GNR 527 of 2004. Section 7 (1). The prospecting work programme must contain: - (f). a description of how the mineral resource and mineral description of the prospecting area will be determined throughout – (i) the prospecting work to be performed. (ii) a geological survey to be carried out; and (iii). A geophysical survey to be undertaken. (g). a description of the prospecting method or methods to be implemented that may include -(i) Any excavations, trenching, pitting, and drilling to be carried out. (ii) Any bulk sampling and testing to be carried out; and (iii) Any other prospecting methods to be applied.	The proposed project is applied for in terms of Section 16 of the MPRDA, 2002 (Act No. 28 of 2002) and the planned activities are according to the scope of the Prospecting Work Programme in terms of the Mineral and Petroleum Resource Development Act, 2002 (Act No. 28 of 2002): Mineral and Petroleum Resources Development Regulations GNR 527 of 2004.

<u>National Environmental Management: Air Quality Act, 2004 (Act 39 Of 2004)</u> The National Environmental Management: Air Quality Act, 2004 (No. 39 of 2004) (NEM: AQA) governs all aspects of air quality, including pollution prevention, national norms and standards, and the requirement for an Atmospheric Emissions Licence (AEL) for listed activities that emit pollutants into the atmosphere and have or may have a significant negative impact on the environment. Activities requiring an AEL are listed in GN No. 893 (22 November 2013), which was published in accordance with Section 21(1) (b) of the NEM: AQA. According to Section 22 of NEM: AQA, no one may engage in a listed activity without an AEL.	The prospecting operation will not be conducting activities that may require the application for an AEL. Regulation 2 of NEMAQA: National Dust Control Regulations GN R827 (01 November 2013) indicates that the purpose of the Act is to prescribe general measures for the control of dust in all areas. Therefore, Molobedu Makoweni will be required in terms of Regulation 6 and 7 of the Act to implement measures for controlling dust and conducting an Ambient Air Quality Monitoring PM₁₀ respectively.
<u>National Environmental Management: Waste Act, 2008</u> The National Environmental Management: Waste Act of 2008 (No. 59 of 2008) (NEM: WA) governs all aspects of waste management, with a focus on waste avoidance and minimization. NEM: WA developed a system for categorizing and licensing waste management activities. Listed waste management activities that exceed certain thresholds are subject to an impact assessment and licensing process. Activities in Category A necessitate a Basic Assessment, whereas activities in Category B necessitate a Scoping and EIA process.	The prospecting activities will not be generating waste that will trigger or require the application of the Waste Management License in terms of the NEMWA.
<u>National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004) (NEM:BA)</u> The NEM:BA governs the management and conservation of South Africa's biodiversity within the framework established by NEMA. This Act also governs the protection of species and ecosystems that require national protection, as well as the management of invasive and alien species. The following regulations have been promulgated in	According to the Biodiversity Impact Assessment that was conducted by Fundor Enviro Services (PTY) Ltd. <i>(attached herein as appendix 5)</i>. The proposed coal prospecting lies within the Vulnerable Zululand Lowveld ecosystem and a Key

accordance with the NEM:BA and are also relevant: Alien and Invasive Species Lists, 2014 published (GN R.599 in GG 37886 of 1 August 2014); National Environmental Management: Biodiversity Act, 2004: Threatened and Protected Species Regulations.	Biodiversity Area, highlighting high biodiversity sensitivity. Although the activity footprint is small (± 0.012 ha), it requires careful planning to avoid intact habitats and minimise vegetation clearance. Key mitigation measures include pre-construction ecological walkovers, optimising drill locations near roads, strict site access control, and post-activity rehabilitation. With these measures, ecological impacts can be reduced from medium-high to low-medium, though residual risks remain due to the conservation importance of the area.
<u>National Noise Control Regulations, R.154 of 1992 (the Noise Regulations) promulgated in terms of Section 25 of the Environmental Conservation Act, 1989 (Act 73 of 1989)</u> The National Noise-Control Regulations (GN R154 in Government Gazette No. 13717 dated 10 January 1992) (NCRs) form part of the Environmental Conservation Act and these Regulations apply to external noise. The NCRs differentiates between Disturbing Noise levels (which is objective and scientifically measurable which are generally compared to existing ambient noise level) and Noise Nuisance (which is a subjective measure and is defined as noise that “<i>disturbs or impairs or may disturb or impair the convenience or peace of any person</i>”). Local Authorities use Controlled Areas to identify areas with high noise levels. Restrictions have been set out for development that occurs in these Controlled Areas. These regulations make provisions for guidelines pertaining to noise control and measurements. The regulations make reference to the use	The EMP include measures to control and manage noise.

of the South African National Standards 10103:2008 (SANS) guidelines for the Measurement and <Rating of Environmental Noise with Respect to Land Use, Health, and Annoyance and to Speech Communication.	
<u>Conservation of Agricultural Resources Act (Act No. 43 of 1983)</u> The objects of this Act are to provide for the conservation of the natural agricultural resources of the Republic by the maintenance of the production potential of land, by the combating and prevention of erosion and weakening or destruction of the water sources, and by the protection of the vegetation and the combating of weeds and invader plants.	According to the Soil, Land use and Land capability assessment that was conducted by Rofhiwavutali (Pty) Ltd. <i>(attached herein as appendix 5)</i> It found that the proposed project will have low to negligible environmental impacts, provided that recommended mitigation measures are implemented. No significant fatal flaws were identified that would prevent the development from proceeding. The site is considered to have low sensitivity, and impacts can be effectively managed through the implementation of the Environmental Management Programme (EMPr) and adherence to relevant environmental legislation.
<u>The National Heritage Resources Act, 1999 (Act No. 25 of 1999) (NHRA)</u> The National Heritage Resources Act, 1999 (Act No. 25 of 1999) (NHRA) is the main piece of legislation in South Africa that protects and regulates the management of heritage resources. The Act requires Heritage Resources Agencies, in this case in the South African Heritage Resources Agency (SAHRA) and the Provincial Heritage Resources Authority of Gauteng (PHRA-G), to be notified of any developments that may exceed certain minimum thresholds as soon as possible.	A Phase 1 Heritage Impact Assessment was conducted by Tsimba Archaeological Footprints (Pty) Ltd. <i>(attached herein as appendix 5)</i> According to their findings, the field survey and desktop study did not identify any archaeological

sites, graves, structures, or other heritage resources within the proposed prospecting footprint.

Although the broader region is considered historically and archaeologically sensitive (linked to the Zulu Kingdom and Stone Age occupation), no heritage features were recorded on-site.

The heritage sensitivity of the specific project area is therefore considered low, and the potential for significant impacts on heritage resources is negligible. The impact significance is rated as low, with no fatal flaws identified that would prevent the development from proceeding.

A Chance Finds Procedure must be implemented during all ground-disturbing activities.

If unknown heritage resources (e.g., graves, artefacts, or human remains) are uncovered during construction, work must stop immediately, and the relevant heritage authority must be notified.

From a heritage perspective, the proposed prospecting activity may proceed, subject to compliance with standard heritage management measures.

7. Need and desirability of the proposed activities.

(Motivate the need and desirability of the proposed development including the need and desirability of the activity in the context of the preferred location).

The mining sector is very crucial to the South African economy. The success of the proposed prospecting activities and quantification of resources would lead to a potential viable economic mining activity. This will consequently boost the countries' current struggling economy, should the project advance to the mining phase. Mining will significantly contribute to local economic growth through direct job creation, future business opportunities, royalties, also contributing to the national gross domestic product and tax revenues.

It has been presumed that the proposed area may have reserves of Coal which is based on the available geological information. The prospecting project will be necessary to ascertain the data in relation to the nature, location, and extent of the ore within the proposed prospecting area. Prospecting will also determine whether there are any features that could affect the economic extraction of coal, should the project advance to the mining phase. Furthermore, if the target minerals are discovered, the information obtained from the prospecting activities will be required to determine how and where the coal body will be extracted, as well as how much economically coal reserves are available within the proposed prospecting area.

Molobedu Makoweni anticipates that significant benefits from the area, should minerals be discovered, will accrue to the immediate area, the sub-region, and the Kwa-Zulu Natal Province. These benefits must be balanced against the costs of the area, including the impacts to the landowner. There is no reason why this proposed project should not be considered at this time, given the high likelihood of a reserve as demonstrated by other resources discoveries in the area.

8. Motivation for the overall preferred site, activities, and technology alternative

- **Preferred site**

The proposed prospecting project site was selected as a preferred site based on the available geological information and historical data of the site. The available geological information suggests that the preferred site may have Coal reserves.

- **Activities**

The prospecting activities will be undertaken in 2-5 phases for a total duration month 13 – month 48, thus five (5) years. The intended activities within the stipulated timeframes will be able to provide sufficient information to declare the occurrence of the targeted mineral bodies. If the intended outcome of the project is not achieved within the intended timeframes, the prospecting right will be subjected to renewal by extending the period up to three (3) years as required in terms of Section 18 of the

MPRDA, 2002 (Act No. 28 of 2002) (as amended). The prospecting activities will include the following activities:

Vegetation clearance of an extent area of 30x30m will be undertaken for the establishment of the site camp offices and auxiliary equipment for the operation.

- **Installation of mobile offices and ablutions facilities.**
- **Construction of temporal access roads** to the site camp and drill sites will be undertaken within the proposed area. However, existing farm roads will be utilized as far as practicable.
- **Drilling** of ten (10) boreholes will be undertaken
- **Rehabilitation** of the overall site and **closure**.
- **Technology alternative**

The layout plan of the infrastructure has been planned to avoid sensitive areas as far as possible. The intended method of vegetation clearance will have minimal environmental impacts. The applicant intends to utilise a bulldozer to clear vegetation for site establishment and the construction of the access roads. A 165mm diameter core drill will be used to drill the geological boreholes at pre-determined sites on the proposed area. There are no alternative technologies identified for the proposed prospecting activities in this regard.

9. Full description of the process followed to reach the proposed preferred alternatives within the site.

NB! – This section is about the determination of the specific site layout and the location of infrastructure and activities on site, having taken into consideration the issues raised by interested and affected parties, and the consideration of alternatives to the initially proposed site layout.

9.1. Details of the development footprint alternatives considered.

With reference to the site plan as provided above and the location of the individual activities on site, provide details of the alternatives considered with respect to:

Molobedu Makoweni intends to conduct the prospecting of Coal to determine whether the area contains these commodities and, if so, whether the mineral reserves are found in quantities that are economically valuable.

According to the NEMA: EIA Regulations GNR 982 (as amended), a Basic Assessment is required to identify alternatives for areas applied for, and in terms of the Regulations, an alternative to a proposed activity means a different strategy to meet the general purpose and requirements of the activity.

9.1.1. The property on which or location where the activity is proposed to be undertaken.

Prospecting sites and associated campsite location and access routes are among the location alternatives considered for the proposed area. The location alternatives were opted for based on several criteria, including environmental considerations (how sensitive the area is in terms of soils,

wetlands, groundwater, and so on), sensitive receptors (proximity to communities and farmsteads), and the area's dependence on the necessary infrastructure.

9.1.2. The type of activity to be undertaken.

Alternative drilling sites cannot be considered at this stage because exploration boreholes can only be sited after desktop assessment, field mapping, and geophysical survey have been completed. There were two alternatives considered which is constructing new roads or using existing roads and establishing tracks. The use of existing roads was preferred because of the impact on vegetation and potential erosion that the construction of new roads might have.

9.1.3. The design or layout of the activity.

Since this area will not require any complicated surface infrastructure, no design and layout alternatives for the proposed area were determined. Alternatives were considered for the location of the campsite. A static location near the entrance of the site, a mobile campsite, and an offsite campsite were among the alternatives considered. The alternative sites were determined based on the sensitivity of the proposed area.

9.1.4. The technology to be used in the activity.

The prospecting activities proposed in the Prospecting Works Programme is dependent on the preceding phase as previously discussed; therefore, no alternatives are indicated, but rather a phased approach of trusted prospecting techniques.

9.1.5. The operational aspects of the activity; and

- **Site Establishment**

Vegetation clearance and topsoil removal in some instances will be undertaken for the establishment of the drill sites.

- **Access Roads**

Existing roads will be utilized as far as possible, and areas of the least sensitivity will be chosen for access roads to the drill sites establishment.

- **Drilling**

Percussion drilling will be undertaken to determine the occurrence and distribution of the ore body. Drilling of the geological boreholes will be conducted at pre-determined sites on the proposed area.

9.1.6. The option of not implementing the activity.

The 'No-Go' alternative is the option to not conduct prospecting activities at the proposed project site. The No-Go alternative assumes that the site would remain in its current condition. The No-Go

alternative would have no impact on the social and biophysical environment.

Molobedu Makoweni intends on prospecting the proposed area to determine the availability of Coal should the mineral be found; the proposed prospecting project alone will result in job creation and support for local businesses.

Accordingly, the consequences of not undertaking the proposed project will diminish the potential positive impacts of this project on the workforce to be used for the prospecting project as well as on the mining project. Therefore, the No-Go alternative is considered undesirable at the local and regional level.

9.2. Details of the Public Participation Process Followed

Describe the process undertaken to consult interested and affected parties including public meetings and one on one consultation. NB! The affected parties must be specifically consulted regardless of whether they attended public meetings. Information to be provided to affected parties must include sufficient detail of the intended operation to enable them to assess what impact the activities will have on them or on the use of their land.

• Public Participation Materials

Following the legislative requirements and good practice, it is important to develop documentation, which will be easily accessible to all stakeholders who would be affected or interested in the project. The following documents were developed and distributed to all stakeholders including the interested and affected parties. The various PPP materials which were used as part of the EIA processes are included as appendices to this report.

Background Information Document (BID):

The BID (**Appendix 3B**) aims to provide important information regarding the following:

- Project description of the proposed prospecting activities.
- The EIA and the PPP will be undertaken in support of the Prospecting activities and relevant contact details.
- Details about how stakeholders could register as an Interested and Affected Party (I&AP) and be kept informed about the Project developments; and
- The public review and comment period for the draft Basic Assessment Report (BAR).
- The BIDs will be hand delivered to the affected and surrounding landowners.

I&APs Registration Form:

A registration form was distributed to the community attached to the BID for the registration of the Interested and Affected Parties (I&AP).

Site notice:

A3 sized site notices informing I&APs about the project information as per the published newspaper advert, will be laminated and erected at the boundary of the proposed site as required in terms of Section 24J of NEMA read with Regulation 41 EIA regulation notices and placed within the vicinity of the proposed project site at strategic locations where it was deemed to be visible to community.

Newspaper advertisements:

A newspaper advertisement, informing all I&APs residing in the surrounding communities near the proposed area within the jurisdiction of the District Municipality of King Cetshwayo was published on the Zululand Observer on the 10th of April 2026 including the information about Molobedu Makoweni's intention to conduct the prospecting activities for Coal, in respect of farm lot 289 Empangeni 13389 GU, and lot 285 Empangeni 13400 GU within the King Cetshwayo District, KwaZulu-Natal Province.

I&APs should register any comments or concerns that they might have regarding the proposed project by contacting EAP, via email through the provided comments request form or request additional information via the telephone. The EAP details are included in the advert, Background Information Document (BID) and site notice.

Public meeting:

A stakeholders engagement meeting will be facilitated to discuss the Draft Basic Assessment Report to obtain comments, issues, concerns, and inputs from the Interested and Affected Parties (I&APs). All comments raised will be recorded in the Comments Response Report (CRR). The minutes of these meetings and presentations will also be included in this report.

9.3. Summary of issues raised by I&APs

Comments and Response Report will be attached as **Appendix 3D** in the final Basic Assessment Report.

9.4. The Environmental attributes associated with the alternatives.

(The environmental attributes described must include socio-economic, social, heritage, cultural, geographical, physical, and biological aspects)

9.4.1. Baseline Environment

9.4.1.1. Type of environment affected by the proposed activity.

(its current geographical, physical, biological, socio-economic, and cultural character).

- **Regional Setting**

The proposed project area is located within the King Cetshwayo District Municipality under the Mfolozi and Umhlanthuze Local Municipalities, KwaZulu-Natal Province.

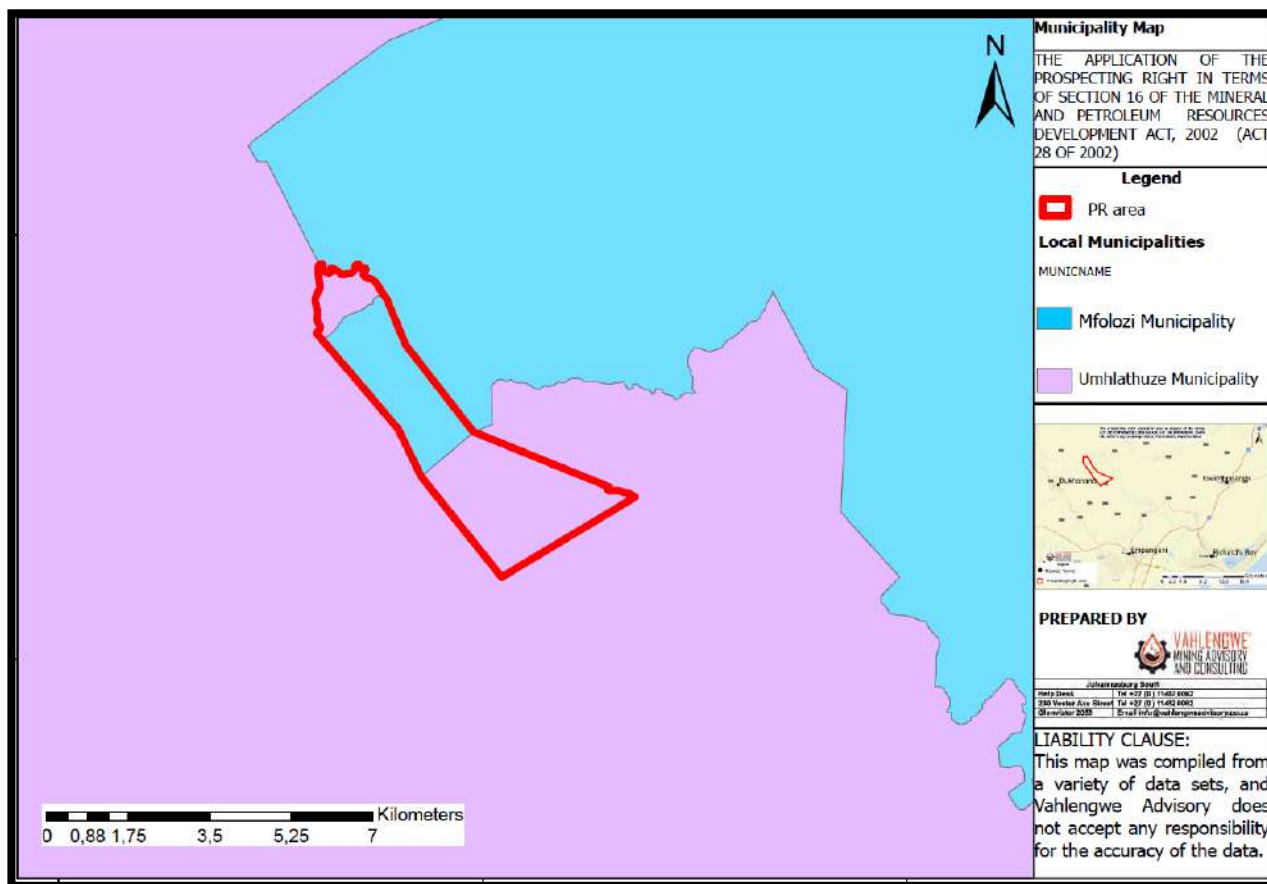


Figure 3: Municipal area

- **Climate**

Average temperature and precipitation are shown in the Figure below. The temperature variations throughout the year are shown in where the solid red line represents the mean daily maximum temperature and the solid blue line indicates the mean daily minimum; the dashed red and blue lines reflect the historical extremes, highlighting the hottest days and coldest nights recorded over the past 30 years. To further illustrate temperature trends.

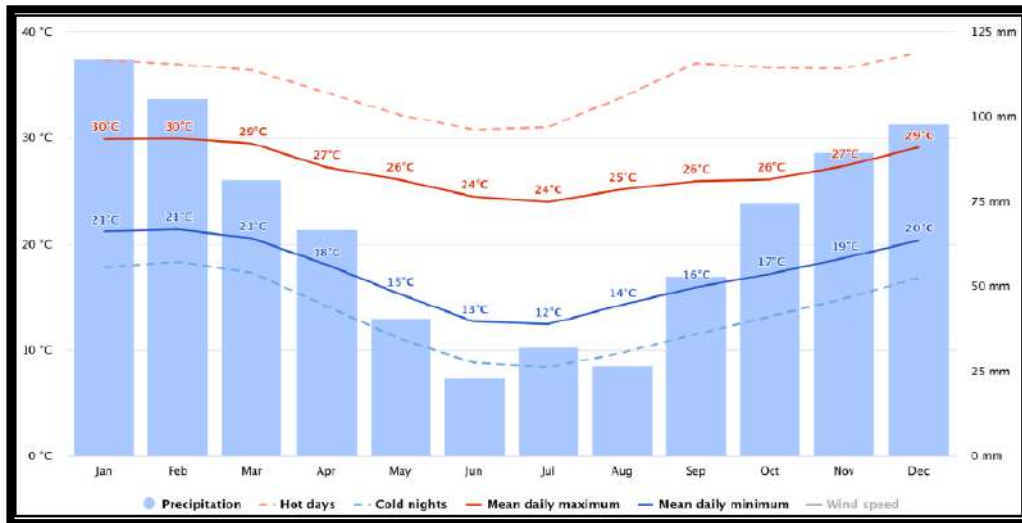


Figure 2: Average climate conditions (<https://www.meteoblue.com>)

The wind rose for the Project Area (Figure 4), shows how many hours per year the wind blows from the indicated direction per wind speed class the modelled data is an accurate representation of actual winds.

Wind blowing from the southwest (SW) toward the northeast (NE). Figure below shows the days per month, during which the wind reaches a certain speed. Wind speeds are generally highest during the spring months (August to October) and lowest during autumn and winter.

(Figure 4-3) presents the wind rose diagram for the area, depicting the frequency and direction of wind patterns throughout the year, for example, wind blowing from the southwest (SW) toward the northeast (NE).

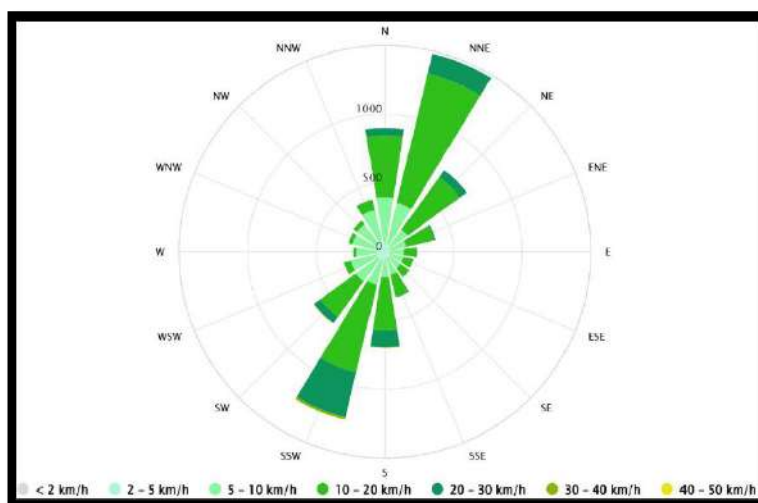


Figure 3: Wind Rose (<https://www.meteoblue.com>)

- **Geology and Soils**

The project area is underlain predominantly by the Emakwezini Formation and intrusions of the Karoo Dolerite Suite. The Beaufort Group in the region is represented by the Emakwezini, Ntabeni, Nyoko and Clarens Formations, which are reported to be of Triassic to Late Jurassic age. The Emakwezini Formation conformably overlies the Volksrust Formation of the Ecca Group and comprises approximately 500 m of shales and fine-grained sandstones, with subordinate siltstones. The sandstones are generally well-bedded and feldspathic in composition. Thin coal seams occur intermittently throughout the Emakwezini Formation. Karoo-aged dolerite intrusions occur in the form of dykes and sills that intruded the older sedimentary rock units. Dolerite dykes, typically ranging in width from 1 m to 8 m, are common within the Karoo Supergroup. Most dykes exhibit a vertical or near-vertical dip, although in the eastern portion of the area they display a westward dip associated with regional structural controls.

Intrusive dolerite sills vary in thickness from approximately 1 m to more than 50 m and occur frequently within the Ecca Group strata.

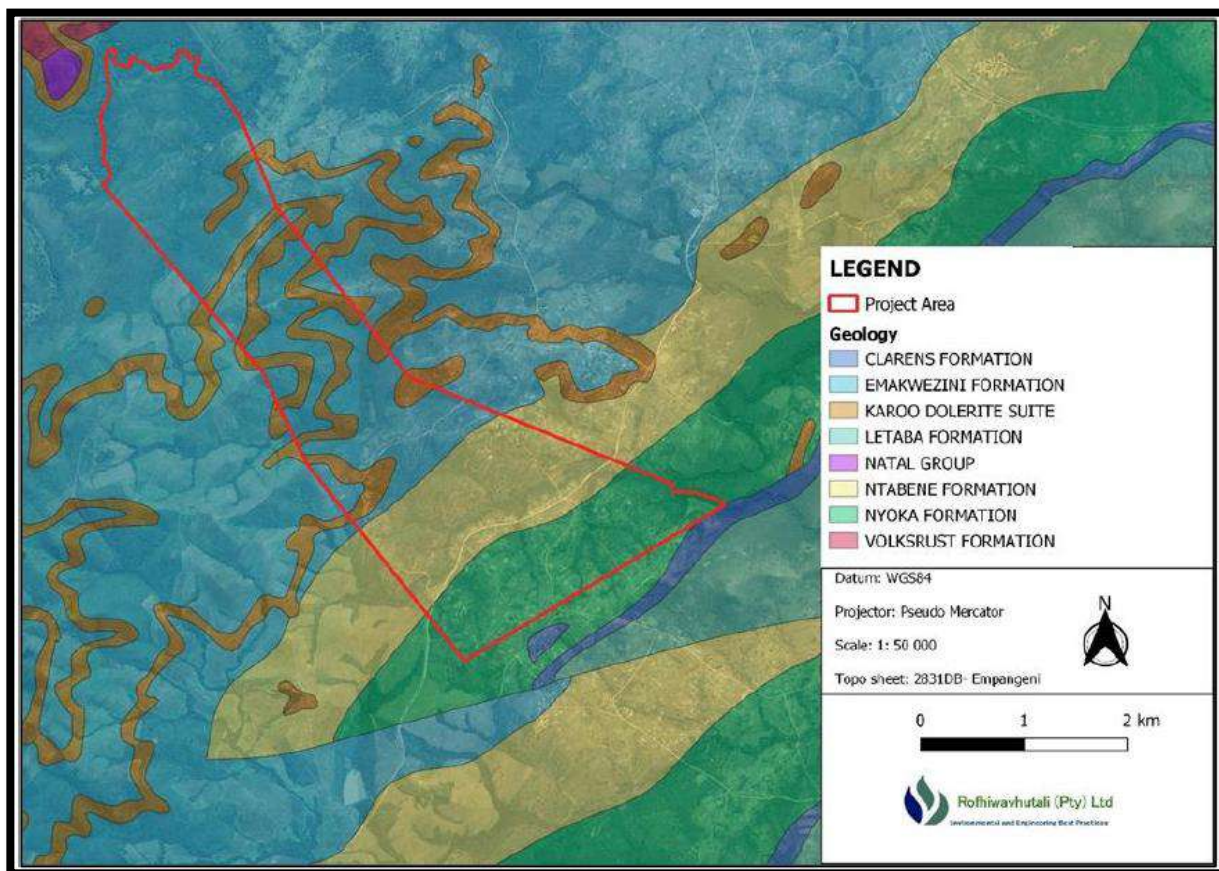


Figure 4: Geological map.

Topography and Drainage

Topography, particularly variations in slope, plays an important role in groundwater vulnerability by influencing the drainage and movement of water across the land surface. Slopes direct surface water flow toward lower-lying areas and depressions, affecting whether contaminants are more likely to run off or infiltrate into the ground.

The study area is predominantly flat to gently rolling, with the presence of an escarpment. Altitude ranges from near sea level to approximately 200–400 m above sea level, as illustrated in the figure below.

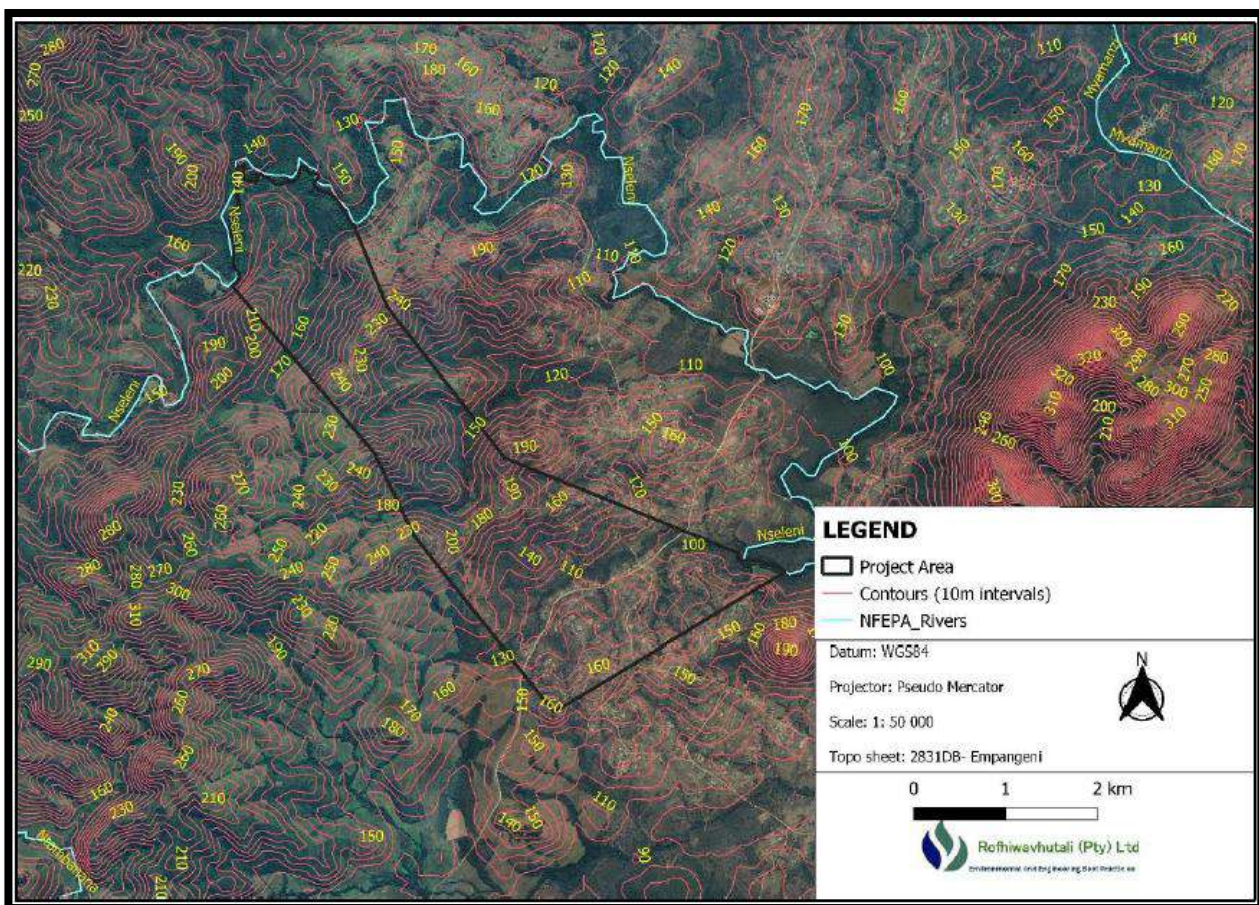


Figure 5: Elevation map

- Hydrology

According to the hydrological impact assessment conducted by Hunts green consulting, the studies states that the site is located within the W12G catchment near the Nseleni River, an area with high ecological importance and sensitivity, but the site itself will experience only limited hydrological disturbance due to the small-scale and temporary nature of prospecting.

Potential impacts from the project are mainly related to:

- Hydrocarbon spills
- Contaminated surface runoff
- Localised sediment mobilisation
- Poor waste management

Hydrological Map

THE APPLICATION OF THE PROSPECTING RIGHT IN TERMS OF SECTION 16 OF THE MINERAL AND PETROLEUM RESOURCES DEVELOPMENT ACT, 2002 (ACT 28 OF 2002)

Legend

NATART

- Artificial
- Estuaries
- Natural
- <all other values>
- Prospecting Right area

LIABILITY CLAUSE:
This map was compiled from a variety of data sets, and Vahlengwe Advisory does not accept any responsibility for the accuracy of the data.

Figure 6: Hydrological Map

- **Biodiversity**
 - **Biomes**

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prevalent in tropical and subtropical regions and is most associated with the expansive landscapes of Africa but can also be found in South America, India, and Australia.

The savannah experiences warm temperatures throughout the year, typically ranging from 20°C to 30°C (68°F to 86°F). The savannah climate features a marked seasonal variation in precipitation, with a distinct wet season and a prolonged dry season. Annual rainfall ranges from about 500 to 1500 mm. The wet season lasts for approximately 6 to 8 months, providing the necessary moisture for grasses and other vegetation to thrive.

The landscape is dominated by various species of grasses, such as elephant grass, Rhodes grass, and Bermuda grass, which can grow up to several meters tall. Trees in the savannah are typically drought-resistant and adapted to withstand fires. Common tree species include acacias, baobabs, and eucalyptus. These trees are widely spaced to reduce competition for water and sunlight. Many plants have developed deep root systems to access groundwater, thick bark to resist fires, and leaves that reduce water loss.

The savannah supports a diverse array of large herbivores like zebras, giraffes, elephants, antelopes, and wildebeests. These animals often migrate to follow the seasonal availability of water and fresh grazing grounds. Predatory animals such as lions, cheetahs, leopards, and hyenas are key components of the savannah ecosystem, maintaining the balance by preying on herbivores. Birds such as ostriches, secretary birds, and various raptors are common. Insects, particularly termites, play a crucial role in nutrient cycling and as a food source for other animals.

Rivers, lakes, and seasonal waterholes are critical for the survival of savannah wildlife, especially during the dry season when surface water is scarce. Efforts to preserve savannah ecosystems include establishing protected areas, promoting sustainable land management practices, and restoring degraded lands. Conservation programs often focus on maintaining biodiversity, supporting local communities, and mitigating the effects of climate change. The savannah biome is a complex and dynamic environment that plays a crucial role in global biodiversity. Its unique combination of grasses and scattered trees supports a wide variety of life forms and ecological processes, making it an essential component of the Earth's natural heritage.

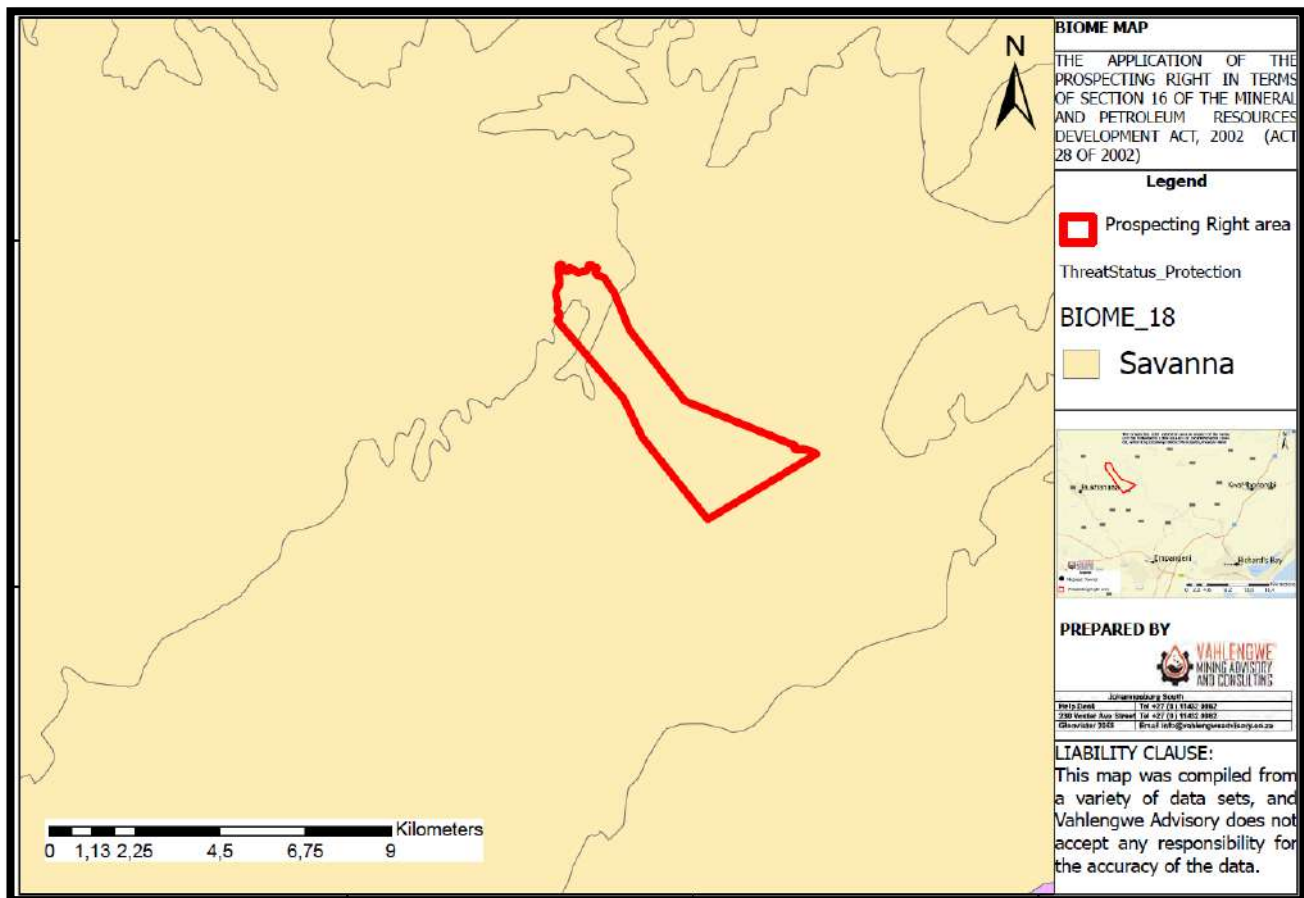


Figure 7: Biomes

▪ Bioregions

The proposed prospecting area falls within the Lowveld bioregion in KwaZulu-Natal and forms part of the Savanna biome characterised by warm, subtropical conditions with moderate to high rainfall. It typically consists of a mix of grasslands and woody vegetation, including thornveld and bushveld, with species such as acacia trees and dense shrub layers. The region supports high biodiversity, including a variety of mammals, birds, and reptiles, and plays an important ecological role through its river systems and habitat connectivity. However, it is also under pressure from agriculture, settlement expansion, mining, and invasive species, leading to habitat transformation and fragmentation. Overall, the Lowveld bioregion is ecologically significant but increasingly vulnerable, requiring careful management and conservation.

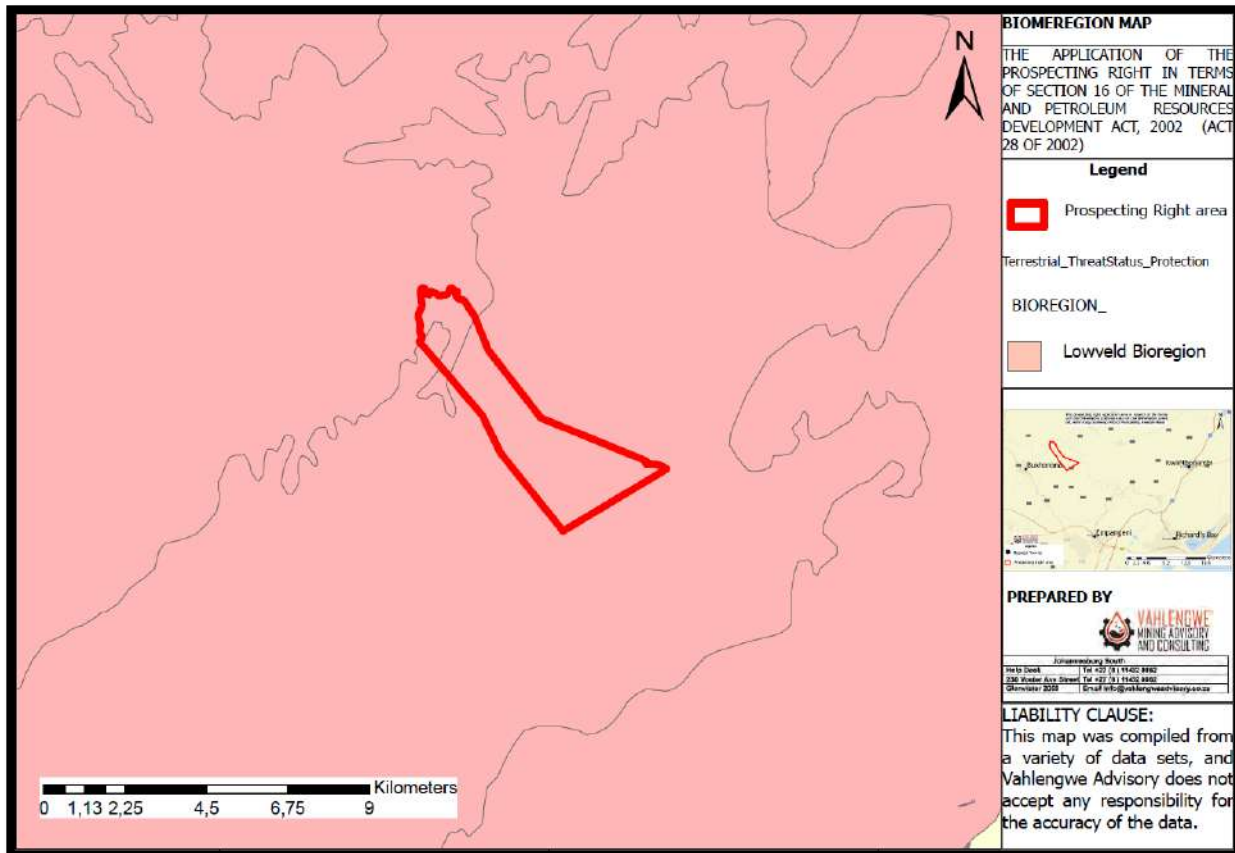


Figure 8: Bioregions

▪ Vegetation Type

The proposed prospecting area falls under The Zululand Lowveld, Northern Zululand Sourveld, and Zululand Coastal Thornveld are key vegetation types within the Savanna of KwaZulu-Natal, collectively characterized by warm climates, summer rainfall, and a mix of grassland and woody vegetation. The Zululand Lowveld typically comprises tall grasses and dense bushveld species, while the Northern Zululand Sourveld represents a transitional system with grass-dominated vegetation that becomes less palatable in winter. The Zululand Coastal Thornveld occurs closer to the coast and is characterised by thorny shrubs and trees interspersed with grasses. These vegetation types support diverse biodiversity, including a range of herbivores, bird species, and smaller fauna, and are often associated with ecologically sensitive areas such as wetlands and river systems. However, they are considered vulnerable due to ongoing pressures from agricultural expansion (particularly sugarcane cultivation), urban development, overgrazing, and habitat transformation, making them important priorities for conservation and sustainable land-use planning within environmental assessments.

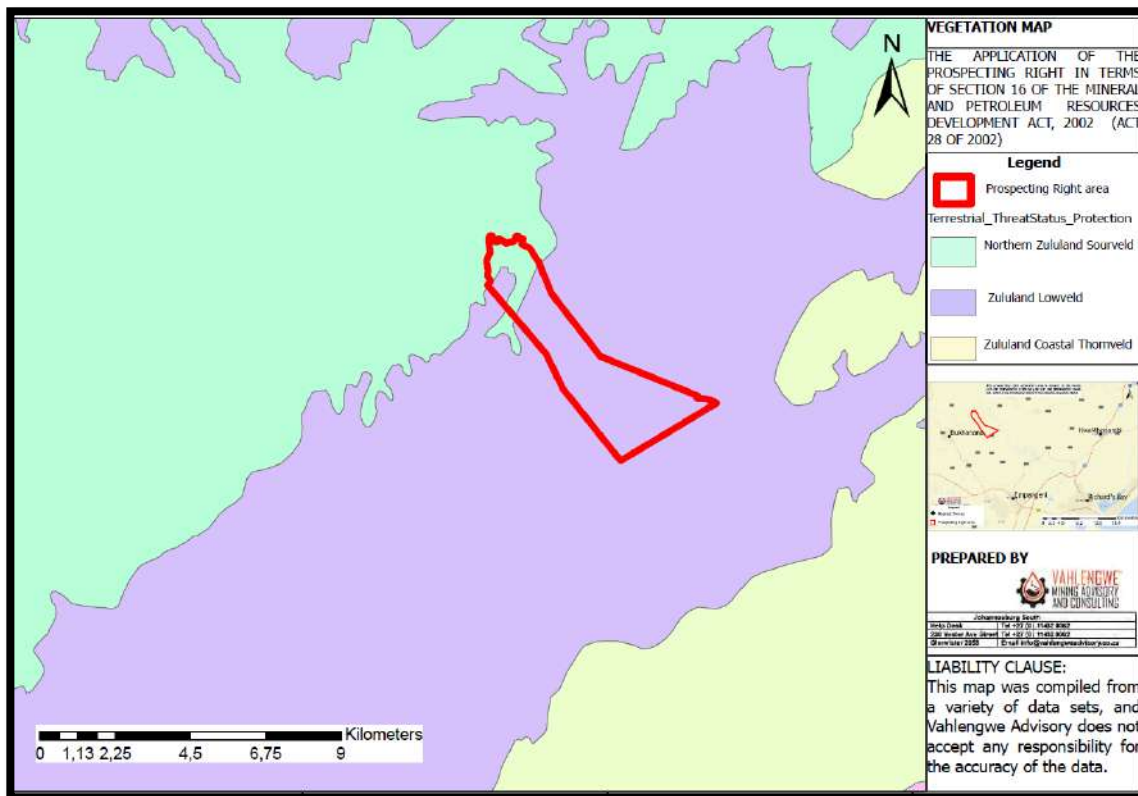


Figure 9: Vegetation type

- Fauna**

The Lowveld/Savanna biome is diverse and includes a range of mammals, birds, reptiles, amphibians, and invertebrates adapted to warm, subtropical conditions. Typical mammals include small antelope, rodents, and larger species in nearby protected areas, while the area supports rich birdlife such as raptors, waterbirds, and woodland species due to the presence of rivers and wetlands like the uMhlathuze system.

Reptiles and amphibians are also common, in moist habitats. However, much of the fauna is influenced by human activities such as agriculture, settlement, and industry, which have led to habitat loss and fragmentation. As a result, species presents are often those that are adaptable or of lower conservation concern, although sensitive and threatened species may still occur in less disturbed or nearby conservation areas.

- Conservation Plan**

KwaZulu-Natal is a province renowned for its rich biodiversity, encompassing a variety of ecosystems from coastal regions and wetlands to grasslands and forests. The Critical Biodiversity Areas (CBAs)

within KZN are regions identified for their high biodiversity value and are essential for maintaining ecological processes and conserving species. These areas are often prioritized for conservation actions to prevent biodiversity loss. KwaZulu-Natal vegetation type data shows that some parts of the proposed prospecting area fall within the irreplaceable CBA.

Mitigation measures from the biodiversity impact assessment studies that was conducted on site include avoiding intact and sensitive habitats, limiting activities to areas near existing roads, minimising vegetation clearing, preventing the creation of new access tracks, controlling invasive alien species, implementing strict spill prevention measures, restricting movement to designated areas, conducting pre-construction ecological walk-throughs, and rehabilitating all disturbed areas immediately after use. These measures are necessary to protect biodiversity and prevent long-term ecological degradation within CBAs.

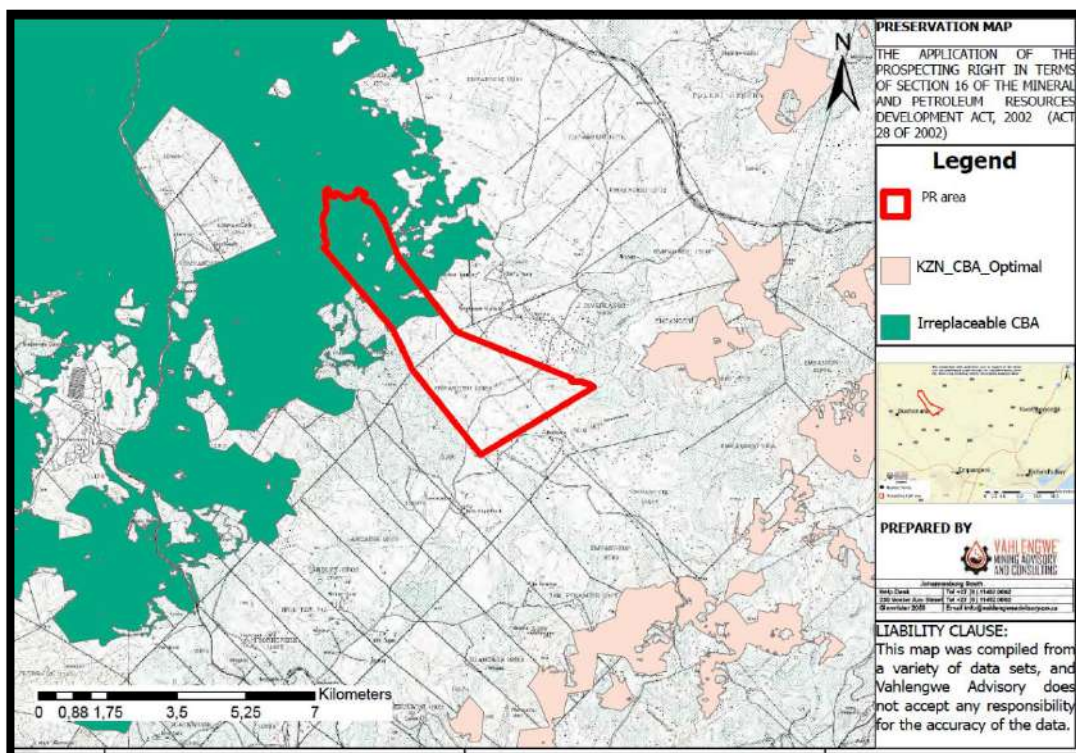


Figure 11: CBA map

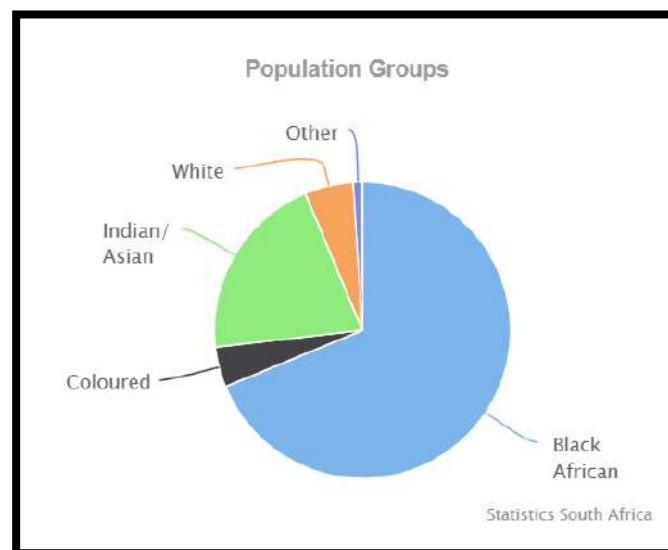
- **Socio-Economic Status**

Empangeni is a town in the King Cetshwayo District Municipality in KwaZulu-Natal, has a socio-economic profile that reflects both challenges and opportunities typical of many small towns in the region. This district faces a range of socio-economic challenges and opportunities that are reflective of its diverse landscape, which includes urban centres, rural areas, and significant natural attractions

such as the Drakensberg Mountains. The district has a sizeable population, predominantly Zulu speaking, with a mix of urban and rural communities. The municipality is characterized by significant challenges, including high unemployment, poverty, and disparities in access to services and opportunities. However, there are also opportunities for growth and development, particularly in agriculture, tourism, and community-driven initiatives. Efforts to improve education, healthcare, and infrastructure are ongoing, and addressing these challenges is critical for the sustainable development of the district.

- **Population profile**

Group	Percentage
Black African	68,8%
Coloured	4,4%
Indian/Asian	20,5%
White	5,3%
Other	1,0 %



Population groups

(Source : Stats SA 2011 Census)

The population of the Local Municipality is relatively young, with a significant portion under the age of 20. There is also a slightly higher number of females compared to males. The working-age population constitutes the bulk of the population, which has implications for local economic development, employment, and social services.

Gender profile

The gender composition is slightly skewed towards the male where both shares of migrated population and male population are lowest in the district. The figure below illustrates the information as captured above.

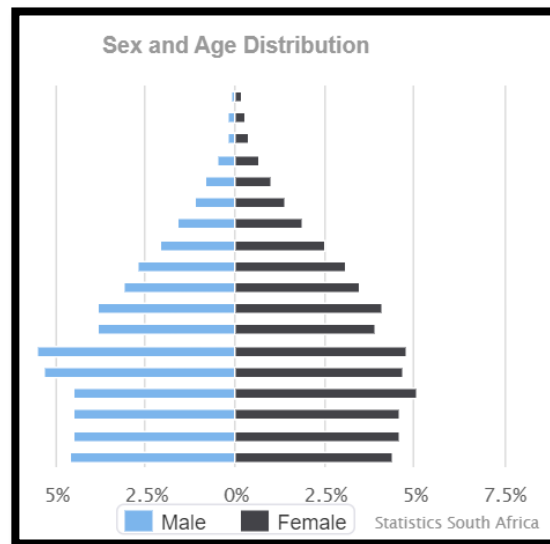


Figure 10: Sex and age Distribution (*Source: Stats SA 2011 Census*)

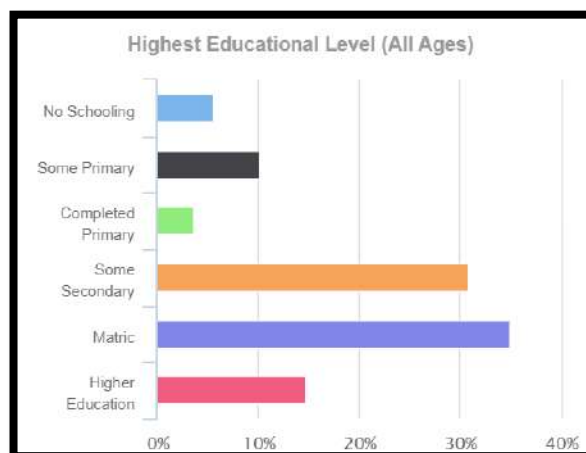


Figure 11: Education level (*Source: Stats SA 2011 Census*)

Between 2001 and 2011 there has been an increase in the number of households that have access to electricity, piped water and formal dwellings. The Figure below shows that majority of people in the municipality depend on the regional or local scheme water supply and the groundwater from boreholes.

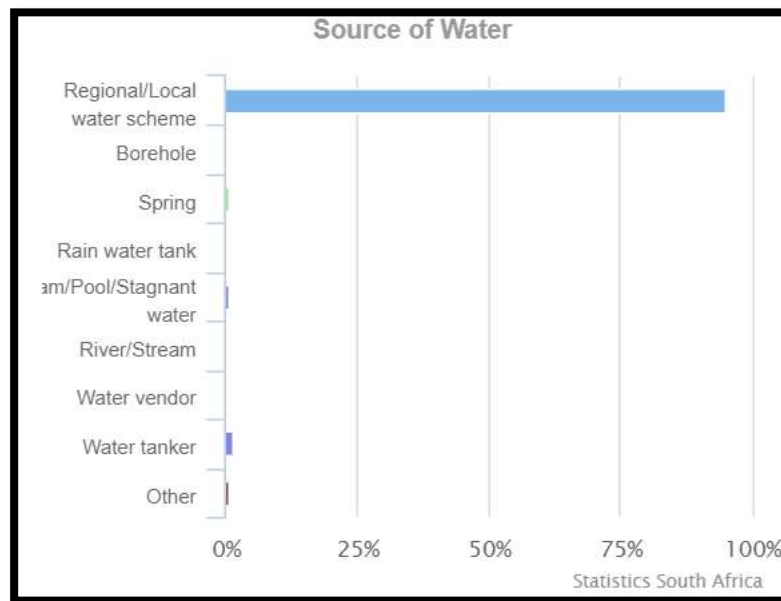


Figure 12: Sources of Water (Source: Stats SA 2011 Census)

The figure below shows the average household income in 2011. It shows that a greater number of people are earning in the R19601 to R38200 income category. This reflects inequality level which undermine efforts to address poverty levels in the municipality.

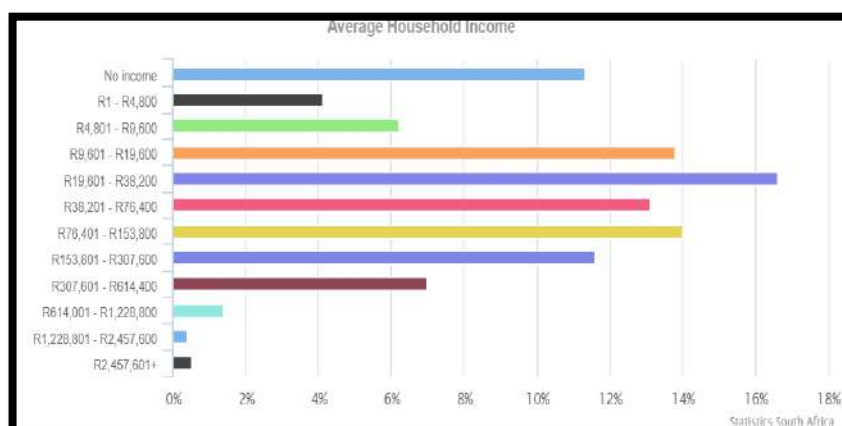


Figure 13: Household Annual Income (Source: Stats SA 2011 Census)

9.4.1.2. Description of the current land uses.

The proposed prospecting area is characterised by predominantly rural and mixed land uses, including subsistence agriculture, livestock grazing, and dispersed communal residential settlements under traditional land tenure systems. Large portions of the area remain covered by natural savanna vegetation and grasslands used for grazing, with some areas supporting forestry plantations. The landscape also includes rivers and wetlands with surrounding buffer vegetation, as well as basic infrastructure such as rural roads and access tracks, reflecting a primarily agriculture-based and community-oriented land-use pattern.

9.4.1.3. Environmental and current land use map

(Show all environmental, and current land use features).

The environmental and current land use of the proposed area is shown on the map below

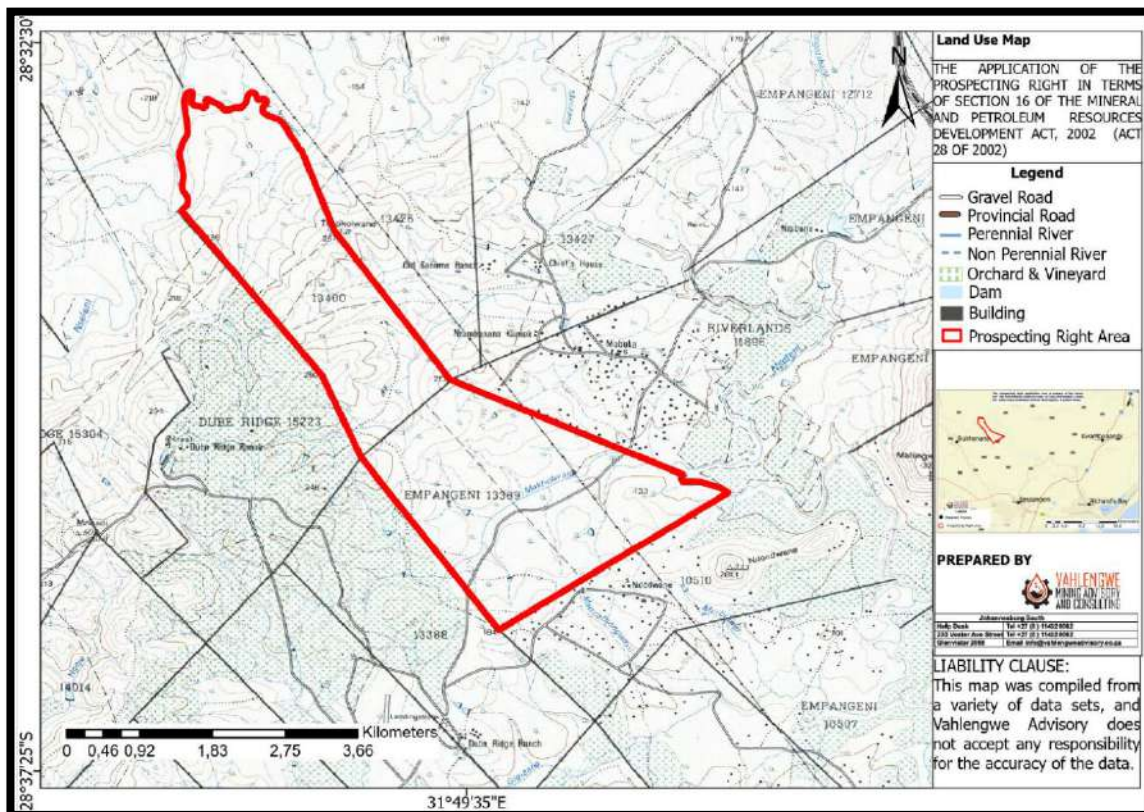


Figure 14: Environmental and Land use map

9.4.2. Impacts and risks identified including the nature, significance, consequence, extent, duration and probability of the impacts, including the degree to which these impacts.

(Provide a list of the potential impacts identified of the activities described in the initial site layout that will be undertaken, as informed by both the typical known impacts of such activities, and as informed by the consultations with affected parties together with the significance, probability, and duration of the impacts. Please indicate the extent to which they can be reversed, the extent to which they may cause irreplaceable loss of resources, and can be avoided, managed, or mitigated).

Project activities

The prospecting activities will include the following activities:

- Establishment of the office and equipment storage site.
- Installation of mobile offices and ablution facilities.
- Construction of temporal access road to the camp.
- Drilling; and
- Rehabilitation and closure.

Impacts associated with the proposed project.

- Topsoil disturbance and soil erosion due to the vegetation clearance during the site establishment and drill sites establishment during the operational phase of the proposed project.
- Disturbance on the flora and fauna.
- Dust generation and noise disturbance due to the movement of the vehicles and operating equipment.
- Soil contamination and groundwater resources contamination due to the hydrocarbon spillages from the fuel storages and/or leakages from the operating vehicles.
- Impacts of socio-economic environments such as the farming and grazing lands; and
- Impacts on cultural, heritage and palaeontological resources

9.4.3. Methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks.

(Describe how the significance, probability, and duration of the aforesaid identified impacts that were identified through the consultation process was determined to decide the extent to which the initial site layout needs revision).

Criteria to Consider when Determining Severity of impacts:

The ranking of impacts/determination of significance is estimated using two criteria, namely Consequence and Probability. These consider the contributing factors / criteria listed in the legislation. The definitions of each are provided below.

The **Consequence** of an impact resulting from an aspect is expressed as a combination of:

- **Nature** of impact: An indication of the extent of the damage (negative impacts) or benefit (positive impacts) the impact inflicts on natural, cultural, and/or social functions (environment).
- **Extent** of impact: A spatial indication of the area impacted (i.e., how far from activity the impact is realised).
- **Duration** of impact: A temporal indication of the how long the effects of the impact will persist, assuming the activity creating the impact ceases. For example, the impact of noise is short

lived (impact ceases when activity ceases) whereas the impact of removing topsoil exists for a much longer period.

- **Frequency** of the impact occurring: An indication of how often an aspect, because of a particular activity, is likely to occur. Note that this does not assess how often the impact occurs. It applies only to the aspect. For example, driving takes place daily whilst other activities take place monthly while the resultant frequency of the impacts occurring will vary based on several factors.

Magnitude/Severity of an impact determines to what extent will the environment be destroyed or its functions be altered by the activity.

Significance of the impact is an indication of the importance of the impact in terms of both the physical extent and the time scale. It indicates the level of mitigation required.

Table 8: Environment impact assessment criteria.

CONSEQUENCE	Nature of Impact:		
	Low	Impacts affect the environment in such a way that natural, cultural. and / or social functions and processes are not affected.	1
	Low-Medium	Impacts affect the environment in such a way that natural, cultural. and / or social functions and processes are affected insignificantly.	2
	Medium	Impacts affect the environment in such a way that natural, cultural. and / or social functions and processes are altered.	3
	Medium-High	Impacts affect the environment in such a way that natural, cultural. and / or social functions and processes are severely altered. Impacts affect the environment in such a way that natural, cultural	4
	High	and / or social functions and processes will temporarily or permanently cease.	5
	Scale/Extent of Impact:		
	Local	The impacted area will only extend as far as the activity being conducted, e.g., the activity footprint	1
	Site	Impact occurs within a 20km radius of the site.	2
	Regional	Impact occurs within a 100km radius of the site.	3
	National	Impact occurs within South Africa.	4
	Duration of Impact:		
	Short-term	The impact will either disappear with mitigation or will be mitigated through the natural processes in shorter time span.	1
	Medium-term	The impact will last up to the end of the project phases, where after it will be negated. The impact will cease within 5 years if the activity is stopped.	3
	Long-term	The impact will last for the entire operational phase and after the operational life of the operation but will be mitigated by direct human action or by natural processes thereafter.	4
	Permanent	Intervention will not occur in such a way or in such a time span. that the impact can be considered transient.	5
	Frequency of the Occurrence of the Impact:		
	Annually or less	Impact occurs at least once in a year or less frequently.	1
	6 months	Impact occurs at least once in 6 months.	2
	Monthly	Impact occurs at least once a month.	3
	Weekly	Impact occurs at least once a week.	4
	Daily	Impact occurs daily.	5
PROBABILITY	Probability of the Occurrence of the impact:		
	Improbable	The possibility of the impact materializing is very low either. because of design or historic experience.	1
	Probable	The possibility of the impact materializing will occur to the extent that provision must be made thereof.	2
	Highly Probable	It is most	4
	Definite	The impact will occur regardless of any prevention measures.	5
	Magnitude of the impacts:		

SIGNIFICANCE	Low	The impact alters the affected environment in such a way that the natural processes are not affected.	2
	Medium	The affected environment is altered; however, the functions and processes continue in a modified way.	6
	High	Function or process of the affected environment is disturbed to the extent where it temporarily or permanently ceases.	8
	Significance of the impact: Sum (Duration, Extent, Duration) x Probability		
	Negligible	The impact is non-existent or unsubstantial and is of no or little importance to any stakeholder and can be ignored.	< 20
	Low	The impact is limited in extent, with low to medium intensity and whatever the probability of the occurrence may be, the impact will not have a material effect on the decision and is likely to require the management intervention with increased costs.	< 40
	Moderate	The impact is of importance to one or more stakeholders, and its intensity will be medium or high; therefore, the impact may materially affect the decision, and management intervention will be required.	< 60
	High	The impact could render development options controversial or the project unacceptable if it cannot be reduced to acceptable levels; and/or the cost of management intervention will be a significant factor in mitigation	> 60

This rating system is weighted in such a way as to set impacts that are very likely to occur, but have very little consequence, as negligible significance. Similarly, impacts with serious consequences but that are unlikely to occur are rated lower, than impacts with serious consequences that are likely to occur.

Table 9: Impacts and risks identified.

Element	Impacts	Mitigation	Post-mitigation					
			Extent	Duration	Probability	Significance	Reversibility	Replaceability
Soils and Land Capability	Soil compaction, erosion and contamination which may disrupt the land purposes for the current land use	- Rehabilitate each site as soon as the drilling is completed. - Conducting preventative soil erosion control measures.	Site	Short-term	Possible	Low	Reversible	Replaceable
Vegetation	Loss of vegetation cover due to clearance during the site preparation. Vehicle movement and compaction of soil minimising plant growth of indigenous flora. Alteration of natural environment and habitat loss. Spreading of invasive alien plants. The altered environment will also favour species that are better adapted to disturbed/transformed areas. Exposed disturbed area with no indigenous vegetation. Long-term or permanent degradation and modification of the receiving environment resulting to the loss of important habitats.	- Environmental awareness and training to the contractors. - Drillers to comply with all EMP procedures. - Drilling sites to be in less sensitive areas as far as possible. - Rehabilitate the disturbed areas as far as possible. - Vehicles should only use designated roadways to access the site. - Have a biodiversity protocol and rehabilitation plan in place that will be implemented upon closure. - Invasive plant material should be disposed by incineration, or alternatively, composting to break down seeds. If seedbank persists, invasive alien plant management and eradication measures should be implemented. - Implement effective rehabilitation measures upon closure. - No fires to be made in the prospecting area.	Site	Short-term	Possible	Low	Reversible	Replaceable

Animal life	Loss of priority fauna species from important habitats. Loss of resident fauna through increased disturbance. Displacement of resident fauna species through increased disturbance.	- Implementing noise monitoring measures and management. - If any animals are encountered, they must not be killed or injured but should rather be removed or chased away from the site. - Avoid vegetation clearance during the breeding season.	Site	Short-term	Possible	Low	Reversible	Irreplaceable
Surface Water	Surface water resources contamination due to hydrocarbons spills, siltation, and disruption to natural drainage systems	- Conducting concurrent rehabilitation - Immediate cleaning after every hydrocarbon spill with a safe disposal method. - Implementing measures to prevent hydrocarbons spills. - Conducting prospecting activities in safe buffer zones (30m) from the water resources.	Local	Medium-term	Probable	Moderate	Irreversible	Replaceable
Ground water	Changes in runoff and infiltration during the operation phase leading to reduce groundwater recharge. Groundwater contamination from fuel & hydrocarbons leakages and spillages from the storage and transporting vehicles. Baseflow reduction caused by proposed activity.	- Implementing measures to minimise the removal of vegetation and opportunities for revegetation will be maximised. - Implement groundwater monitoring to detect groundwater contamination. - Implementation of the mitigation measures to minimise hydrocarbon spills. - Conducting prospecting activities in low groundwater sensitivity area.	Site	Short-term	Probable	Low	Irreversible	Replaceable
Air Quality/ Dust	Dust generation by vehicle movement on dust roads and during drilling operations.	- Implement management measures to minimise the generation of dust such as dust suppression. - Ensure compliance to speed limits.	Site	Short-term	Highly Probable	Low	Irreversible	Replaceable

Noise	Noise nuisance will be created by the drilling rig, operating equipment, and vehicle movement.	- Ensure vehicles and equipment is maintained. - Silencers should be fitted on all engines.	Site	Short-term	Probable	Low	Irreversible	Replaceable
Cultural Heritage	Destruction of archaeological remains. Disturbance of graves. Disturbance of buildings and structures older than 60 years old. Destruction public monuments and plaques.	- Use chance find procedure to cater for accidental finds. - Maintaining a 100m buffer from all identified 'no-go' areas with heritage resources. - Encountered heritage resources, including fossils, graves, or human remains must be reported to the relevant authorities.	Site	Short-term	Improbable	Low	Reversible	Replaceable
Visual	Visual disturbance of the movement of drilling equipment and other vehicles.	Rehabilitate drill sites and access tracks.	Site	Short-term	Probable	Low	Reversible	Irreplaceable
Socio-economic	Disruption to the economic agricultural practices.	Practice concurrent rehabilitation to minimise the time and financial resources to rehabilitate the area to return to its continuous economic practices.	Site	Short-term	Probable	Low	Irreversible	Replaceable
Safety	Equipment theft and property vandalism	- controlled access to the site by deploying security personnel who would also conduct security patrols to monitor the perimeters of the project site. - All project infrastructure should be contained in a safe and secured area.	Local	Short-term	Probable	Low	Reversible	Replaceable
Health	Health impact due to dust inhalation, occupational injuries.	- Implementation of the dust generation mitigation measures and dust monitoring measures - Issue with instructions to wear the appropriated personal protective equipment (PPE) to the working personnel.	Local	Medium term	Probable	Moderate	Reversible	Replaceable

		Place safety signs and put barricades where there's possible danger to health and safety of the community.						
Waste Generation	Waste nuisance and littering	- Ensure implementation of the waste management programme with the application of waste classification and separation. - Proper waste collection and disposal. - Conduct environmental awareness training.	Site	Short Term	Probable	Low	Reversible	Replaceable
Traffic and access	Prospecting activities will generate very limited additional traffic. Prospecting vehicles are to access the property via existing roads and tracks only.	- Comply with traffic regulations. - Ensure compliance to speed limits.	Site	Short Term	Probable	Low	Reversible	Replaceable

9.4.4. The positive and negative impacts that the proposed activity (in terms of the initial site layout) and alternatives will have on the environment and the community that may be affected.

(Provide a discussion in terms of advantages and disadvantages of the initial site layout compared to alternative layout options to accommodate concerns raised by affected parties).

The impacts assessed has highlighted potential risks, important management strategies and control measures associated with the Project. It is considered there are opportunities to substantially enhance and improve the current and on-going impacts by undertaking a well-planned and effective prospecting operation. The project has associated positive and negative impacts, and such impacts are described in the table below:

Table 10: Positive and Negative impacts

Aspect	Description
Positive	
Soils and Land Capability	Potential for neighbouring communities to benefit from assistance with shared land management responsibilities.
Animal Life	The opportunity of implementing processes around feral animal control.
Socio-economic	Opportunities for indigenous employment and economic development. Requirement for the supply of the goods and services from the local businesses; and Requirement for short-term accommodation and thus benefiting the house rental and accommodation sector.
Waste	Supporting local recycling centre and local scrap metal merchant; and Metals such as steel and copper wire will be collected in designated areas prior to removal from site for recycling.
Negative	
Soils and Land Capability	Landscape disturbance. Soil compaction and soil erosion due to the movement of heavy vehicles in the on-site; and Soil contamination due to hydrocarbon spillages from the fuel storages and vehicles.
Flora and Fauna	Introduction of alien vegetation; and Loss of flora and fauna and habitat destruction
Surface water resources	Erosion and sedimentation leading to soil scouring and increased turbidity of water courses and drainage lines downstream.
Groundwater resources	Contamination of groundwater due to chemicals and hydrocarbons seepage
Noise	Noise nuisance due to moving vehicles and equipment
Air Quality/Dust	Dust creation during clearance, placement of infrastructure and the drilling operations
Visual	Increased visual intrusion due to operation infrastructure and the movement of the operating equipment and vehicles
Socio-economic	Project is unsustainable in terms of job security due to the life of project
Cultural and Heritage Resources	Indigenous resources, values, and aspirational impacts
Waste	Waste generation including the domestic, scrap and hazardous waste
Health and Safety	Inheritance of occupational health problems and exposure to occupational hazards
Traffic and Access	Addition to the existing traffic of the movement of vehicles

Table 11: Positive and negative impacts of the proposed activity.

Impact	Rating Pre-Mitigation	Construction	Operation	Decommission	Rating post-mitigation
Positive (+)	Low	Job creation	• Employment opportunities and job security • Support to local businesses • Income generation for accommodation business sector • Supporting local recycling centre and local scrap metal merchant	• Employment opportunities	Low
Negative (-)	Low	• Visual nuisance • Health and Safety impacts • Surface and groundwater contamination • Impacts on traffic. • Disturbance on the landscape • Waste generation	• Visual nuisance • Health and Safety impacts • Surface and groundwater contamination • Impacts on traffic. • Unsustainable job security • Disturbance on the landscape • Waste generation	• Visual nuisance • Health and Safety impacts • Surface and groundwater contamination • Impacts on traffic. • Job losses	Low
Negative (-)	Medium	• Habitat disturbance • Vegetation disturbances • Loss of biodiversity • Soil erosion • Soils contamination • Visual nuisance to moving equipment and vehicles. • Noise disturbances	• Habitat disturbance • Vegetation disturbances • Loss of biodiversity • Alien vegetation species invasion • Soil erosion • Impacts on groundwater quality. • Soils contamination • Visual nuisance due to moving equipment and vehicles. • Noise disturbances	• Habitat disturbance • Vegetation disturbances due to vegetation clearance • Alien vegetation species invasion • Soil erosion • Impacts on groundwater quality. • Waste generation • Visual nuisance due to moving equipment and vehicles	Medium

9.4.5. The possible mitigation measures that could be applied and the level of risk.

(With regard to the issues and concerns raised by affected parties provide a list of the issues raised and an assessment/ discussion of the mitigations or site layout alternatives available to accommodate or address their concerns, together with an assessment of the impacts or risks associated with the mitigation or alternatives considered).

All possible mitigation measures that could be applied to risks regarding the site layout are discussed and considered as part of the EIA process. The proposed mitigation measures for the assumed risks are outlined on this report.

9.4.6. Motivation where no alternative sites were considered.

The prospecting activities are intended to be conducted in search of the coal deposits. The mineral occurs in specific areas limited to geological formation. The historical data shows that there could be the occurrence of coal in the area, and therefore, the prospecting activities are ought to be undertaken in the proposed site. The proposed site has existing access roads that will be used during the operational phase of the project and minimal infrastructure will be established due the site location.

9.4.7. Statement motivating the alternative development location within the overall site. (Provide a statement motivating the final site layout that is proposed)

Based on the different studies conducted, it has been concluded that all invasive prospecting activities will not be undertaken in sensitive areas wherein considerate buffer zones (100m) will be created from all identified environmental sensitive and 'no-go' area.

9.5. Full description of the process undertaken to identify, assess and rank the impacts and risks the activity will impose on the preferred site (In respect of the final site layout plan) through the life of the activity.

(Including (i) a description of all environmental issues and risks that were identified during the environmental impact assessment process and (ii) an assessment of the significance of each issue and risk and an indication of the extent to which the issue and risk could be avoided or addressed by the adoption of mitigation measures.)

Environmental Impact Assessment (EIA):

Environmental impacts can have both negative and positive consequences for the environment and its inhabitants. These effects can have an impact on the air, land, water, fish, wildlife, or the entire ecosystem. Environmental impact assessment is a method of assessing the environmental consequences and potential negative effects of changes.

Humans' activities have a wide range of effects on the physical environment, including overpopulation, pollution, the use of fossil fuels, and deforestation. These types of changes have resulted in climate change, soil erosion, poor air quality, and undrinkable water. These negative consequences can influence human behaviour and lead to mass migrations or battles over clean water.

The purpose of the EIA Phase is to investigate the potential negative and positive impacts of a proposed project activities on the environment. The potential impacts will then be quantified to assess the significance that an impact may pose on the receiving environment. The objectives of the EIA process are to:

- Ensure that the potential biophysical and socio-economic impacts of the proposed project, are taken into consideration during the decision-making process.
- Ensure that the project activities to be undertaken do not have a substantial detrimental impact on the environment by presenting management and mitigation measures that will avoid and/or reduce those impacts.
- Ensure that I&APs are informed, including the landowner, about the proposed Project and the public participation process is properly followed.
- Ensure that I&APs are given an opportunity to raise concerns, and make input to understand their needs and expectations; and
- Provide a process aimed at enabling authorities to make an informed decision, especially in respect of their obligation to take environmental and social considerations into account when making those decisions.

The EIA process will assess the overall aspects affected by the proposed project in relation to the activities to be conducted. A sensitivity report has been conducted to determine the sensitivity of the proposed area to make sound decision on the consideration and implementation of the mitigation measures of the impacts posed by the proposed activity.

Using the significance criteria, impacts can be assigned a rating of a potential risk, uncertain risk, and significant risk.

- **Extreme**

These are unacceptable risks that are primarily critical in nature in terms of the extent and long-term environmental harm, permanent sacred site damage, fatality, and massive economic impacts that are effectively regarded as a possibility to almost certain to occur. Such risks significantly exceed the risk acceptance threshold and necessitate comprehensive control measures as well as additional urgent and immediate attention to the identification and implementation of risk-reduction measures.

- **High**

Typically refer to significant to critical consequences, such as significant environmental or heritage damage, as well as significant safety, social, or economic consequences that are likely to cut across the possible to almost certain likelihood ratings. These are also likely to exceed the risk acceptance threshold, and while proactive control measures have been planned or implemented, a very close monitoring regime and additional actions to reduce risk are required.

- **Medium**

As the classification suggests, medium level risks encompass a range of risk combinations ranging from relatively low consequence / high likelihood to mid-level consequence / low likelihood scenarios across environmental, social, and economic domains. Because they are effectively positioned on the risk acceptance threshold, these risks are likely to necessitate active monitoring.

- **Low**

These risks are below the risk acceptance threshold and although they may require additional monitoring in certain cases are not considered to require active management. In general, such risks represent relatively low likelihood and low to mid-level consequence scenarios.

- **Very Low**

Impacts risks that are below the risk acceptance threshold and would at the most require additional monitoring and in many cases would not require active management. These risks can include unlikely to rare events with minor consequences and in essence relate to situations around very low probabilities of relatively minor impacts occurring.

The probability of occurrence has been categorised within the context of reasonable timeframes and frequencies given the nature of the anticipated project life. The following table defines the levels of likelihood and severity for the types of consequences that comprise the risk rating determination:

Table 12: Likelihood rating system

Rating	Likelihood	Definitions
5	Almost certain	The event is expected to occur in most circumstances (The event is likely to occur once per year).
4	Likely	The event will probably occur in most circumstances (The event is likely to occur once every 1 – 2 years).
3	Possible	The event might occur at some time (The event is likely to occur once every 2 – 5 years).
2	Unlikely	The event could occur at some time (The event is likely to occur once every 5 – 10 years).
1	Rare	The event may occur only in exceptional circumstances (The event is unlikely to occur in any 10-year period).

Risk Analysis Matrix

The risk controls are linked to the level of risk and the opportunity for risk reduction to meet the project rehabilitation objectives and goals, which are linked to an environmentally and socially responsible operation, and these requirements are part of the regulatory obligations and impact assessment

guidelines. The table below summarizes the qualitative risk matrix used, as well as the risk levels for the various consequence and likelihood combinations.

Table 13: Risk Analysis Matrix

	Severity of Consequence					
Likelihood of Consequence		Critical (5)	Major (4)	Significant (3)	Moderate (2)	Minor (1)
	Almost Certain (5)	Extreme	Extreme	High	High	Medium
	Likely (4)	Extreme	High	High	Medium	Medium
	Possible (3)	Extreme	High	Medium	Medium	Low
	Unlikely (2)	High	Medium	Medium	Low	Very Low
	Rare (1)	Medium	Medium	Low	Low	Very Low

The impact assessment will focus on the invasive activities of the project since they will have the potential to impact on the biophysical and the social environment of the proposed area. These activities include:

- Vegetation clearance for site (camp and drill sites) establishment.
- Installation of mobile offices and facilities.
- Construction of temporal access roads to the site camp and drill sites.
- Drilling; and
- Rehabilitation of the overall site and closure.

The impact assessment is furthermore separated into three distinct phases, namely:

- Site establishment/construction phase.

The site establishment will include the clearance of vegetation to establish the camp and drill sites. Various aspects of the environment will be subjected to the disturbances due to this activity.

- Operational phase; and

The operational phase will include the drilling operation whereby the drill cores will be logged and taken to the lab for analysis.

- Decommissioning.

This phase will entail the removal of all temporal infrastructure and the rehabilitation of all the disturbed area at the prospecting site

Table 14: Identified and assessed impacts and risks the activity will impose on the preferred site.

Aspect	Impact	Mitigation Measures	*C	*L	*R
Vegetation	- Loss of vegetation cover due to clearance during the site preparation. - Vehicle movement and compaction of soil minimising plant growth of indigenous flora. - Alteration of natural environment and habitat loss. - Spreading of invasive alien plants. The altered environment will also favour species that are better adapted to disturbed/transformed areas. - Exposed disturbed area with no indigenous vegetation. - Long-term or permanent degradation and modification of the receiving environment resulting to the loss of important habitats. - Loss of vegetation cover due to clearance during the site preparation. - Vehicle movement and compaction of soil minimising plant growth of indigenous flora. - Alteration of natural environment and habitat loss. - Spreading of invasive alien plants. The altered environment will also favour species that are better adapted to disturbed/transformed areas. - Exposed disturbed area with no indigenous vegetation. - Long-term or permanent degradation and modification of the receiving environment resulting to the loss of important habitats.	- Environmental awareness and training to the contractors. - Drilling sites to be located in less sensitive areas as far as possible. - Rehabilitate the disturbed areas as far as possible. - Vehicles should only use designated roadways to access the site. - Have a biodiversity protocol and rehabilitation plan in place that will be implemented upon closure. - Invasive plant material should be disposed by incineration, or alternatively, composting to break down seeds. If seedbank persists, invasive alien plant management and eradication measures should be implemented. - Implement effective rehabilitation measures upon closure.	Pre – Mitigation		
			2	3	M
			Post – Mitigation		
			1	3	L
Animal Life	- Loss of priority fauna species from important habitats. - Loss of resident fauna through increased disturbance. - Displacement of resident fauna species through increased disturbance.	- Environmental awareness and training for workers about the animal life on site. - Killing of animals on site will be strictly prohibited and animal found on site must be safely removed from the operation. - Implementing noise monitoring measures and management. - Avoid vegetation clearance during the breeding season.	Pre – Mitigation		
			2	3	M
			Post – Mitigation		
			1	3	L
Soils and Land Capability	- The removal of vegetation associated with the prospecting activities will allow for increased surface water runoff, which may lead to change in topographical characteristics of the area. - Land clearance during establishment of infrastructure will disturb the natural sequence of soil layers thereby changing the soil and land capability. - The movement of heavy vehicles in the operation area will result in compaction of soil, water runoff and soil erosion especially during the rainy season.	- Removal of vegetation must be undertaken in a phased approach to limit the number of exposed areas at a time. - Regular roads maintenance of eroded shoulders. - A cleaned-up of any hydro-carbon spills on soil must be undertaken by trained personnel using commercially available emergency clean-up kits.	Pre – Mitigation		
			3	3	M
			Post – Mitigation		
			1	3	L

	The equipment and vehicles may contaminate the soil due to hydrocarbon spillages.				
Surface water resources	- Contamination of water resources and deterioration of water quality; and - Disturbance of free drainage and runoff.	- Remediate using commercially available emergency clean up kits; and - Re-profiling and rehabilitation of the disturbed landscapes. - Implementing temporary erosion control measures.	Pre – Mitigation		
			3	3	M
			Post – Mitigation		
			2	2	L
Groundwater resources	- Changes in runoff and infiltration during the operation phase leading to reduce groundwater recharge. - Groundwater contamination from fuel & hydrocarbons leakages and spillages from the storage and transporting vehicles. - Baseflow reduction caused by proposed activity.	- Implementing measures to minimise the removal of vegetation and opportunities for revegetation will be maximised. - Implement groundwater monitoring to detect groundwater contamination. - Implementation of the mitigation measures to minimise hydrocarbon spills. - Conducting prospecting activities in low groundwater sensitivity area.	2	2	L
Noise	- Increase in ambient noise levels during the operational phase; - Disturbances to faunal species behaviour during the operational phase.	- Limiting the site establishment activities working hours to daylight hours (07h00 to 17h00) and not undertaking such activities at all on Sundays and public holidays. - Applying an operating buffer of a minimum 50m, but preferably 100m between drill site and any dwellings.	Pre – Mitigation		
			3	3	M
			Post – Mitigation		
			2	3	M
Air Quality/Dust	- Possible dust generation in some areas including the drilling during operations. - Heavy dust deposition can have detrimental effects on plants if the leaves are smothered to the extent where transpiration and photosynthesis are affected. - Health impacts on livestock and people in proximity to the project site due to fine particulate emissions during construction and operational phases.	- Conduct dust fall-out monitoring. - Enforcing the speed limits to reduce dust created by moving vehicles. - Haul roads in use will be subjected to dust suppression management measures. - Implement concurrent rehabilitation activities to minimise the number of exposed surfaces that would result in dust generation. - It must be noted that the speed limit for driving within a community and prospecting right shall be limited to 40Km/h on exposed surfaces.	Pre – Mitigation		
			2	3	M
			Post – Mitigation		
			1	3	L
Visual	- Visual disturbance due to site clearance. - Dust generated during site establishment. - View disturbance due to the operating of the equipment	- Ensure that all exposed surfaces are subjected to dust suppression. - Clearing of vegetation must be undertaken within the demarcated boundaries of the designated area only.	Pre – Mitigation		
			3	3	M
			Post – Mitigation		
			2	2	L

Socio-economic	- The effect of this prospecting activity for employment and socio-economic regime would be positive, but very limited in extent and duration. - Disturbance on the current commercial activities.	- Skill development and transfer. - Maximise procurement of goods and services from local providers.	Pre – Mitigation		
			1	3	L
			Post – Mitigation		
Cultural and Heritage Resources	- Destruction of archaeological remains. - Disturbance of graves. - Disturbance of buildings and structures older than 60 years old. - Destruction public monuments and plaques.	- Use chance find procedure to cater for accidental finds. - Maintaining a 100m buffer from all identified 'no-go' areas with heritage resources. - Encountered heritage resources, including fossils, graves, or human remains must be reported to the relevant authorities.	2	2	L
			Post – Mitigation		
			1	2	VL
Waste	- Waste Generation including general, scrap and hazardous waste. - If this waste is not stored correctly, can lead to environmental pollution including soil and water resources.	- Classification and separation of the waste into general or hazardous must be implemented onsite into different coloured and labelled bins. - Uncontrolled disposal of waste must strictly be prohibited on site	Pre – Mitigation		
			2	2	L
			Post – Mitigation		
Safety	Theft of equipment and the damage of infrastructure.	- Ensure that there is a controlled access to the site by deploying security personnel who would also conduct security patrols to monitor the perimeters of the project site thereby providing an increased security presence. - Consult with the local police branch to establish standard operating procedures for the control and/or removal of loiterers. - All project infrastructure should be contained in a fenced and secured area to prevent unauthorized access and potential health and safety risks.	Pre – Mitigation		
			2	3	M
			Post – Mitigation		
Health	The dust generation with potentially particulate matter, which can be inhaled, causing respiratory diseases.	- All area that are sources of dust must be subjected to dust suppression. - Continuous dust monitoring should be carried out throughout the project undertakings. - All employees will be issued with and instructed to wear the appropriated personal protective equipment (PPE).	Pre – Mitigation		
			2	3	M
			Post – Mitigation		
			1	3	L
			Post – Mitigation		
			1	3	L
*C – Consequences *L – Likelihood of consequences *R – Residual Risks VL – Very Low L – Low M – Medium H - High					

10. Assessment of each identified potentially significant impact and risk.

(This section of the report must consider all the known typical impacts of each of the activities (including those that could or should have been identified by knowledgeable persons) and not only those that were raised by registered interested and affected parties).

Table15: Assessment of the potentially significant impact and risk

NAME OF ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	SIGNIFICANCE	MITIGATION TYPE	SIGNIFICANCE
-Site establishment -Construction of access roads -Prospecting activities (Drilling)	<u>Vegetation</u> Destruction of natural vegetation Loss of threatened plant species Invasion of alien and invasive vegetation Exposure to erosion Loss of biodiversity	Vegetation (flora)	Construction, Operational, and Decommissioning	Moderate	Environmental awareness and training to the contractors. Drilling sites to be located in less sensitive areas as far as possible. Rehabilitate the disturbed areas as far as possible. Vehicles should only use designated roadways to access the site. Have a biodiversity protocol and rehabilitation plan in place that will be implemented upon closure. Invasive plant material should be disposed by incineration, or alternatively, composting to break down seeds. If seedbank persists, invasive alien plant management and eradication measures should be implemented. Implement effective rehabilitation measures upon closure.	Low
	<u>Animal Life</u> Loss of priority fauna species Loss of resident fauna through increased disturbance. Displacement of resident fauna species.	Animal life (fauna)	Construction, Operational, and Decommissioning	Moderate	Environmental awareness and training for workers about the animal life on site. Killing of animals on site will be strictly prohibited and animal found on site must be safely removed from the operation. Implementing noise monitoring measures and management.	Low

					Avoid vegetation clearance during the breeding season.	
	Noise Noise nuisance due to the drilling activities and movement of operating equipment and vehicle	Air quality Animal life	Construction, Operational, and Decommissioning	Low	Conducting regular equipment maintenance to minimise noise generated by the operating equipment. Limiting the operation times to daylight hours (07h00 to 17h00) on Mondays to Fridays, Saturdays (07h00 to 14h00) and no activities to be conducted on Sundays and public holidays. Maintaining a buffer of 100m between the operation area and dwellings.	Low
	Visual Visual disturbance to the surrounding due to the project activities Visual impact on observers travelling along the roads and residents	Aesthetic beauty of the surrounding Social practices around the area	Construction, Operational, and Decommissioning	Low	Minimise unvegetated areas as far as possible. Concurrent rehabilitation of all disturbed areas.	Low
	Air Quality Dust generation	Dust fall & nuisance from prospecting activities	Construction, Operational, and Decommissioning	Low	Implementation of the dust suppression system. Low vehicle speeds enforcement on unpaved surfaces. Maintain a buffer of 500m- 1000m between operational site and dwellings.	Low
	Soils and land Capability Soil Compaction leading to erosion and sedimentation. Destruction on current land use	Soil and vegetation Land use	Construction, Operational, and Decommissioning	Moderate	Provide adequate erosion control measures where required. No mixing of fertile soils with sub soils during construction. Implement concurrent and re-vegetate all disturbed with locally indigenous species as soon as possible.	Low

	<u>Surface water</u> Sedimentation and siltation of water courses Alteration of natural drainage patterns Contamination of water resources Degradation of surface quality	Surface water quality	Construction, Operational, and Decommissioning	Moderate	Remedy the possible effects of alteration to natural drainage lines. Implementing the hydrocarbon spillages management plan. Ensure that wastewater is appropriately managed. Implement the erosion control measures.	Low
	<u>Groundwater resources</u> Changes in runoff and infiltration Groundwater contamination from fuel & hydrocarbons leakages and spillages Baseflow reduction	Groundwater quality	Construction, Operational, and Decommissioning	Moderate	Implementing measures to minimise the removal of vegetation and opportunities for revegetation will be maximised. Implement groundwater monitoring to detect groundwater contamination. Implementation of the mitigation measures to minimise hydrocarbon spills. Conducting prospecting activities in low groundwater sensitivity area.	Low
-Site establishment -Construction of access roads -Prospecting activities (Drilling)	<u>Health and Safety</u> Health and safety of employees and surrounding communities	Human health and safe working environment	Construction, Operational, and Decommissioning	Moderate	All employees or sub-contractors entering site must be inducted to ensure the awareness of the developed health and safety plan. Appoint a health and safety representatives to be appointed during operations. Conduct daily inspections and observations of on-site activities shall take place. All incidents to be reported, recorded, investigated, and mitigated. Employees or sub-contractors must be informed as to what required PPE is applicable in working sections and must always be equipped with appropriate PPE. Safety signs to be provided in areas considered as high-risk areas. Provided adequate first aid services on site; and	Low

					Promote ongoing health and safety awareness campaigns.	
-Site establishment -Construction of access roads -Prospecting activities (Drilling)	<u>Socio-economic</u> Increased employment opportunities Local economic development	Economic activities such as the commercial farming Land uses	Construction, Operational, and Decommissioning	Moderate	Conduct consultation with local communities through the appropriate channels to ensure the use of local skills and businesses where possible. Ensure local employment and local services providers are appointed where possible from the local area; and Ensure that goods and services are procured from within the local area as far as possible.	Low
-Site establishment -Construction of access roads -Prospecting activities (Drilling)	<u>Heritage</u> Destruction of archaeological remains. Disturbance of graves. Disturbance of buildings and structures older than 60 years old. Destruction public monuments and plaques.	Loss of heritage & palaeontological resources	Construction, Operational, and Decommissioning	Low	Use chance find procedure to cater for accidental finds. Maintaining a 100m buffer from all identified 'no-go' areas with heritage resources. Encountered heritage resources, including fossils, graves, or human remains must be reported to the relevant authorities.	Low
-Site establishment -Construction of access roads -Prospecting activities (Drilling)	<u>Traffic Management</u> Construction vehicles and access roads Operation staff transportation trips, maintenance, and delivery trips	Pressure on public transport infrastructure Socio-economic conditions	Construction, Operational, and Decommissioning	Low	The surface quality of the road is not negatively impacted resulting from vehicle movement. Sections of existing road surfaces which have been impacted on by the vehicle movement and Existing road surfaces must be utilised and maintained within baseline levels.	Low
-Site establishment -Construction of access roads -Prospecting activities (Drilling)	<u>Waste Management</u> General waste generation and hazardous waste generation	Soil contamination Contamination of water resources Impacts on human health	Construction, Operational, and Decommissioning	Low	Promoting the reduction, re-use, or recycle of waste where prevention is not possible; Disposal of waste to local waste disposal sites; Littering should be strictly prohibited; and Implement waste classification and separation system.	Low

11. Summary of specialist reports.

(This summary must be completed if any specialist reports informed the impact assessment and final site layout process and must be in the following tabular form):

A Screening Report for an Environmental Authorization was generated from the DFFE Web-based Environmental Screening Tool (Appendix 4). The following is a summary of the environmental sensitivities at the site where the proposed prospecting activities are to be undertaken. Consequently, the drilling activities will be undertaken on an area where there are no sensitivities.

Table 16: Environmental Sensitivity of the proposed area.

THEME	Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
Agriculture Theme	X			
Animal Species Theme		X		
Aquatic Biodiversity Theme	X			
Archaeological and Cultural Heritage Theme				X
Civilian Aviation Theme		X		
Defence Theme				X
Palaeontology Theme	X			
Plant Species Theme			X	
Terrestrial Biodiversity Theme	X			

Specialist studies were conducted, and mitigation measures will be implemented accordingly.

12. Environmental impact statement

12.1. Summary of the key findings of the environmental impact assessment.

Most of the prospecting activities are non-invasive and hence will have no environmental or social impact. The invasive activities that entail the site establishment and the drilling of approximately 10 drill holes will have a minimal environmental and social impact as the overall site establishment, and the drill sites will be confined to an area of approximately 0.6 hectares and 0.9 hectares respectively

The assessed impact ratings after implementation of the mitigation measures described above are as follows:

Table 17: Summary of the Environmental Impact Assessment

Aspects	Activity Phases	Impact significance	
		Pre – Mitigation	Post – Mitigation
Flora and Fauna	Construction, Operational, and Decommission	Moderate	Low
Noise	Construction, Operational, and Decommission	Low	Low
Visual	Construction, Operational, and Decommission	Low	Low
Air Quality/Dust	Construction, Operational, and Decommission	Low	Low
Soils and Land Capability	Construction, Operational, and Decommission	Moderate	Low
Surface and Groundwater Resources	Construction, Operational, and Decommission	Moderate	Low
Health and Safety	Construction, Operational, and Decommission	Moderate	Low
Socio – Economic	Construction, Operational, and Decommission	Moderate	Low
Cultural and Heritage Resources	Construction, Operational, and Decommission	Low	Low
Traffic	Construction, Operational, and Decommission	Low	Low
Waste	Construction, Operational, and Decommission	Low	Low

Most of the identified impacts will occur for a limited period and the extent of the impacts will be localised. All the identified impacts can be suitably mitigated with the residual impact ratings ranging from **low** to **negligible** significance. After drilling activities have been completed and the drill pads rehabilitated to predrilling status, the land will be returned to its pre-prospecting impacts state.

12.2. Summary of the positive and negative impacts and risks of the proposed activity and identified alternatives.

Table 18: Summary of the positive and negative impacts and risks of the proposed activity and identified alternatives

Proposed Activity	Aspects
Non – Invasive Activities	No impacts on site
Positive	
Invasive Activities: Site establishment, Operation and decommission	Potential for neighbouring communities to benefit from assistance with shared land management responsibilities.
	The opportunity of implementing processes around feral animal control.
	• Opportunities for indigenous employment and economic development. • Requirement for the supply of the goods and services from the local businesses; and • Requirement for short-term accommodation and thus benefiting the house rental and accommodation sector.
	• Supporting local recycling centre and local scrap metal merchant; and

	Metals such as steel and copper wire will be collected in designated areas prior to removal from site for recycling.
	Potential for neighbouring communities to benefit from assistance with shared land management responsibilities.
	The opportunity of implementing processes around feral animal control.
Negative	
Invasive Activities: Site establishment, Operation and decommission	- Soil compaction and soil erosion due to the movement of heavy vehicles in the on-site; and - Soil contamination due to hydrocarbon spillages from the fuel storages and vehicles.
	- Introduction of alien vegetation; and - Loss of flora and fauna and habitat destruction.
	Erosion and sedimentation leading to soil scouring and increased turbidity of water courses and drainage lines downstream.
	Contamination of groundwater due to chemicals and hydrocarbons seepage.
	Noise nuisance due to moving vehicles and equipment.
	Dust creation during clearance, placement of infrastructure and the drilling operations.
	Increased visual intrusion due to operation infrastructure and the movement of the operating equipment and vehicles.
	Project is unsustainable in terms of job security due to the life of project.
	Indigenous resources, values, and aspirational impacts.
	Waste generation including the domestic, scrap and hazardous waste.
	Inheritance of occupational health problems and exposure to occupational hazards.
	Addition to the existing traffic of the movement of vehicles

12.3. Proposed impact management objectives and the impact management outcomes for inclusion in the EMPr;

Based on the assessment and where applicable the recommendations from specialist reports, the recording of proposed impact management objectives, and the impact management outcomes for the development for inclusion in the EMPr as well as for inclusion as conditions of authorisation.

The objectives of the EMPr will be to:

- Provide sufficient information to strategically plan the prospecting activities as to avoid unnecessary social and environmental impacts.
- Ensure that the prospecting activities are conducted in a sustainable manner.
- Develop an approach that will ensure compliance with relevant legislations; and
- Provide a management plan that is effective and practical for implementation.

Through the implementation of the proposed mitigation measures it is anticipated that the identified environmental impacts can be managed and mitigated effectively.

- Heritage/cultural resources can be managed by avoidance of known resources and through consultation with landowners/stakeholders. Contractor personnel will also be briefed of these

sensitivities and consequences of any damage/removal of such features; Should the exploration program advance to the drilling stage, a phase 1 heritage assessment will be undertaken prior to identification of drill sites once areas of drilling interest have been determined.

- Noise generation can be managed through consultation and restriction of operating hours and by maintaining equipment and applying noise abatement equipment if necessary.
- Visual intrusion can be managed through consultation with landowners/stakeholders and by suitable siting of drill pads and use of screens (natural vegetation or shade cloth etc).
- Dust generation can be managed by limiting as far as possible the exposure of surfaces, application of dust suppression methods on exposed surfaces and use of water during drilling.
- Soil disturbance and clearance of vegetation at drill pad areas will be limited to the absolute minimum required and disturbed areas will be re-vegetated with locally indigenous species as soon as possible.
- Protecting biodiversity by conducting the ecological impact assessment prior to any invasive activities being conducted to ensure that impacts of protected and vulnerable species are prevented and where impacts cannot altogether be prevented minimised and mitigated.
- Manage as far as possible the soil, surface water and groundwater contamination by hydrocarbons by conducting proper vehicle maintenance, refuelling with care to minimise the chance of spillages and by having a spill kit available on each site where prospecting activities are in progress.
- Conduct an appropriate public consultation and conflict resolution during stakeholder consultation phases. All prospecting personnel will be made aware of the local conditions and sensitivities in the prospecting area and that they always treat residents with respect and courtesy.

12.4. Aspects for inclusion as conditions of Environmental Authorisation.

(Any aspects which must be made conditions of the Environmental Authorisation)

It is the opinion of the EAP that the following conditions should form part of the authorisation:

- Maintain a buffer of 100m from sensitive areas.
- Maintain a minimum 500m (preferably 1000m) buffer from any infrastructure or dwelling.
- Conduct a heritage survey of the identified drill sites and access routes once these are known and prior to any activities being undertaken at these sites.
- Conduct an ecology and wetland survey of any identified drill sites and access routes that may fall within any critical endangered ecosystems; and
- Landowners and land occupiers should be engaged (re-consulted) at least 1 month prior to any site activities being undertaken once drill sites are known.

12.5. Description of any assumptions, uncertainties, and gaps in knowledge.

(Which relate to the assessment and mitigation measures proposed)

The location of site camp and drill sites is not yet known and will be identified through the phased approach of the prospecting programme. This assessment is therefore based on a desktop approach at a broad scale and assuming that the site camping and drilling could occur anywhere within the proposed prospecting area.

Once camp and drill sites have been identified, specific focus will be given to ecological and Heritage screening and assessment along possible access routes to ensure that valued ecological components, threatened species and Heritage artefacts are not inadvertently damaged. In addition, landowners will be engaged with regards to the progress of the operation and to discuss the proposed invasive prospecting activities and identified locations with the landowner at that point in time.

12.6. Reasoned opinion as to whether the proposed activity should or should not be authorised.

12.6.1. Reasons why the activity should be authorized or not.

The applicant is committed to conduct the prospecting activities in a sustainable manner and to comply with the prescribed environmental legislations to protect the environment and manage as far as possible the impacts associated with the project. Therefore, the applicant will ensure that:

- The prospecting program will be developed in a phased manner commencing with non-invasive activities to bring refinement to understanding of the geological anomaly.
- The environmental impacts associated with the prospecting activities are deemed to be minimal provided that the proposed mitigation is implemented.
- If the success exceeds expectations/assumptions, the financial guarantee will be reviewed annually and variation in the planned work programme will be revised in line with Section 102 of the MPRDA.
- With appropriate care and consideration, the impacts resulting from the prospecting activities can be suitably avoided, minimised, or mitigated.
- With implementing the appropriate rehabilitation activities, the impacts associated with the prospecting activities can be reversed; and
- Without implementation of prospecting activities, the knowledge concerning the potential mineral resource within the prospecting right area will not be confirmed.

12.6.2. Conditions that must be included in the authorisation.

The following conditions could form part of the authorisation:

- Maintain a 100m buffer from sensitive areas; • Maintain a 500m (preferably 1000m) buffer from any infrastructure or dwelling.
- Conduct a heritage survey of the identified drill sites and access routes across undisturbed land once they are known and before any activities are carried out at these sites.
- Conduct an independent ecology and wetland survey of the identified camp and drill sites, as well as access routes to be built on undeveloped land. A special emphasis should be placed on assessing any critical endangered ecosystems in the prospecting area; and
- Once the camp and drill sites have been determined, landowners and land occupiers should be consulted before any site activities begin.

Table19: Closure components to the prospecting activities

Components	Extent	Description
1.Dismantling of processing plant and related structures	0m ³	There will not be a processing of the material for this project
2(A). Demolition of steel buildings and structures	0m ²	There will be no steel structures
2(B). Demolition of reinforced concrete buildings and structures	0m ²	Only mobile offices and ablutions will be put on site and removed upon closure of the project
3. Rehabilitation of access roads	150m ²	There are temporary access roads that will require rehabilitation
4(A). Demolition and rehabilitation of electrified railway lines	0m	There are no electrified railway lines
4(B). Demolition and rehabilitation of non-electrified railway lines	0m	There are no non-electrified railway lines
5. Demolition of housing and/or administration facilities	0m ²	There is no housing that will require demolition
6. Opencast rehabilitation including final voids and ramps	0	No excavation will be required to be undertaken
7. Sealing of shafts, audits, and inclines	0m ³	There are no shafts, audits nor inclines on site
8(A). Rehabilitation of overburden and spoils	0ha	The spoils from the drilling will be used to backfill the drillholes.
8(B). Rehabilitation of waste deposits and evaporation ponds (non-polluting potential)	0ha	There is no processing waste deposits and evaporation ponds
8(C). Rehabilitation of processing waste deposits and evaporation ponds (polluting potential)	0ha	There will be no wastewater being generated on site
9. Rehabilitation of subsided areas	0ha	The prospecting activities are not associated with subsidence
10. General surface rehabilitation	0,205ha	The area that will require rehabilitation will include the site camp, drill sites and access roads
11. River diversions	0m	The prospecting area is not associated with river diversions
12.Fencing	0m	Fencing would not be required

13. Water management	0ha	There are water circulation dams that needs to be rehabilitated
14. 2 to 3 years of maintenance and aftercare	0ha	All disturbances will be subjected to rehabilitation

12.7. Specific Information required by the competent Authority.

12.7.1. Compliance with the provisions of sections 24(4) (a) and (b) read with section 24 (3) (a) and (7) of the National Environmental Management Act (Act 107 of 1998). the EIA report must include the: -

12.7.1.1. Impact on the socio-economic conditions of any directly affected person.

(Provide the results of Investigation, assessment, and evaluation of the impact of the mining, bulk sampling, or alluvial diamond prospecting on any directly affected person including the landowner, lawful occupier, or, where applicable, potential beneficiaries of any land restitution claim, attach the investigation report as an **Appendix**.)

A public consultation process will be undertaken as part of the environmental authorisation process. This process will provide Interested and Affected Parties (I&APs), including landowners and lawful occupiers, with an opportunity to raise concerns and provide input on the proposed development. All issues and concerns raised will be recorded and addressed in the Public Participation section of this report, and appropriate mitigation measures will be considered to accommodate stakeholder expectations and inform the decision-making process

12.7.1.2. Impact on any national estate referred to in section 3(2) of the National Heritage Resources Act.

(Provide the results of Investigation, assessment, and evaluation of the impact of the mining, bulk sampling or alluvial diamond prospecting on any national estate referred to in section 3(2) of the National Heritage Resources Act, 1999 (Act No. 25 of 1999) with the exception of the national estate contemplated in section 3(2)(i)(vi) and (vii) of that Act, attach the investigation report as **Appendix 2.19.2** and confirm that the applicable mitigation is reflected in 2.5.3; 2.11.6. and 2.12. herein).

The Phase 1 Heritage Impact Assessment (HIA) studies that were conducted states that the area also reflects colonial-era developments such as farming expansion, the establishment of Empangeni as a magistrate's seat in 1894, and the construction of the Zululand Railway in 1903. While no fatal flaws were identified, the assessment confirmed that the project triggers several provisions of the KwaZulu-Natal Amafa and Research Institute Act, 2018, requiring careful consideration of heritage resources including graves, archaeological sites, and cultural landscapes.

Mitigation measures recommended include conducting detailed surveys to identify and record archaeological, historical, and cultural sites, implementing chance finds procedures during construction to protect unearthened graves or artifacts, liaising with local communities and stakeholders to ensure cultural concerns are addressed, and applying conservation or preservation strategies where significant heritage resources are found. The report emphasizes integrating heritage management into the development process, proposing monitoring, documentation, and protective measures to minimize adverse impacts while allowing the project to proceed in a way that respects both tangible and intangible heritage.

12.8. Other matters required in terms of sections 24(4) (a) and (b) of the Act.

(The EAP managing the application must provide the competent authority with detailed, written proof of an investigation as required by section 24(4)(b)(i) of the Act and motivation if no reasonable or feasible alternatives, as contemplated in sub-regulation 22(2)(h), exist. The EAP must attach such motivation as an **Appendix**).

The proposed prospecting activities (including the drilling) requested as part of this authorisation is the viable way a mineral resource can be identified and used to generate a SAMREC compliant resource which is a minimum requirement to determine whether it is viable to invest in a future mine. Therefore, the proposed prospecting activities to be undertaken will be part of the feasibility studies to determine whether the minerals of interest will be economically viable to mine.

PART B

ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

13. Environmental Management Programme Introduction.

13.1. Details of the EAP

(Confirm that the requirement for the provision of the details and expertise of the EAP is already included in PART A, section 2 herein as required).

This has already been covered. Refer to Part A, Section 2 of this document.

13.2. Description of the Aspects of the Activity

(Confirm that the requirement to describe the aspects of the activity that are covered by the environmental management programme is already included in PART A, section (5) herein as required).

This has already been covered. Refer to Part A, Section 5 of this document.

13.3. Land use Map

(Provide a map (**Attached as an Appendix**) at an appropriate scale which superimposes the proposed activity, its associated structures, and infrastructure on the environmental sensitivities of the preferred site, indicating any areas that any areas that should be avoided, including buffers)

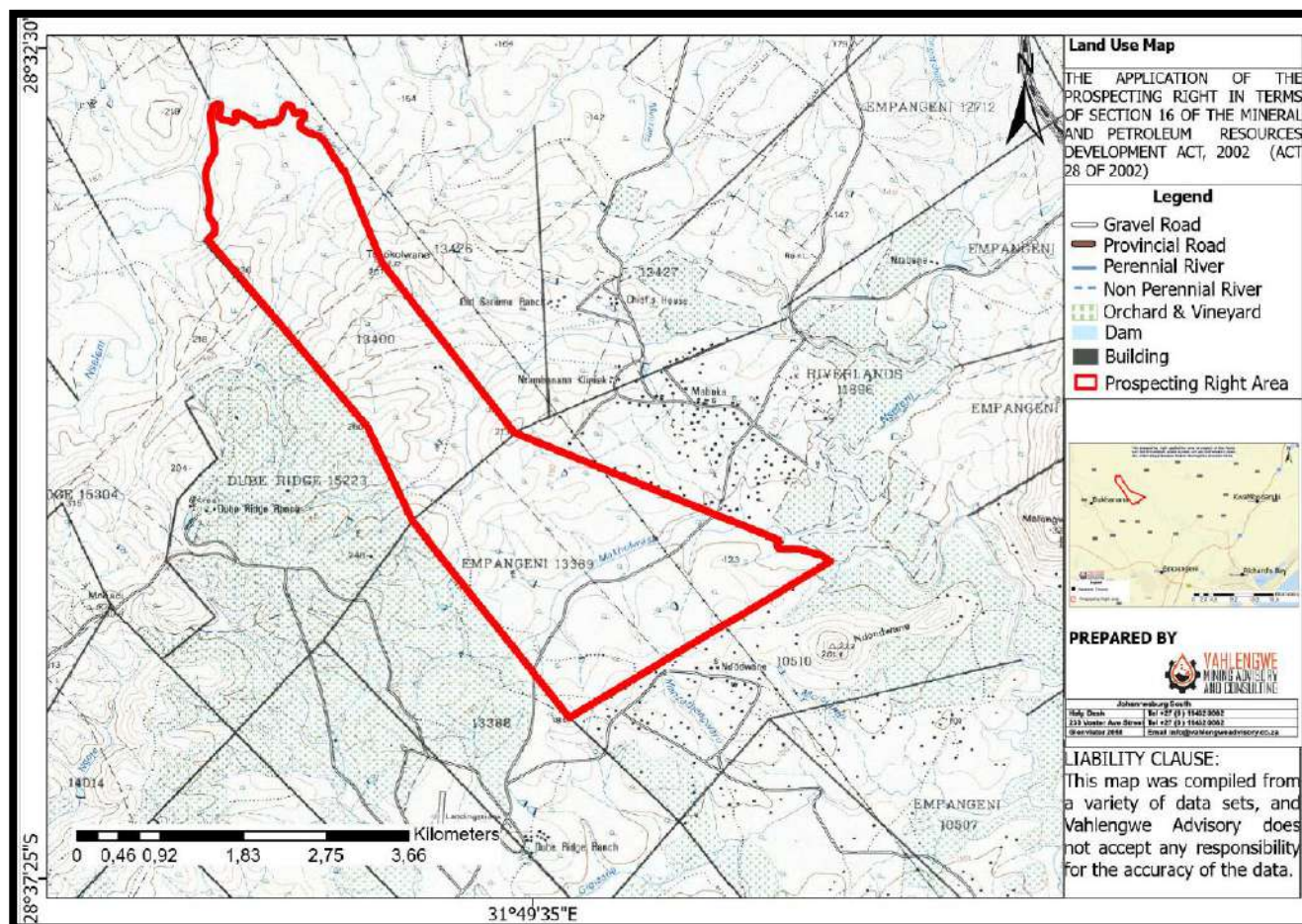


Figure 20: Land use Map

14. Description of Impact management objectives including management statements

The proposed impact management objectives and management statements are informed by the environmental setting of the site where the proposed prospecting activities will be undertaken, and the desired state post rehabilitation of the site.

14.1. Determination of closure objectives

The vision, and consequent objectives and targets for rehabilitation, decommissioning, and closure, are intended to reflect the local environmental and socio-economic context of the project, as well as to reflect both the corporate requirements and stakeholder expectations.

The receiving environment within which the prospecting activities will be undertaken include the following key land-uses:

- Nature Conservation.
- Agricultural activities; and
- Livestock Grazing

In practice, the post-closure land-use has been determined by the pre-prospecting land use applicable to the precise area of the invasive prospecting activities. Given that the exact locations of the intended prospecting activities have been identified and assessed, it can be said that the closure plan will sufficiently address the objectives for the preferred alternative. This EMPr, on the other hand, aims to address the key closure objectives, which are likely to remain consistent over most prospecting activities.

The Rehabilitation plan shall outline the closure objectives, which are focused at restoring the landform, land use, and vegetation units to their pre-prospecting state, unless the landowner requests a specified, justifiable replacement land use. As a result, the disturbed prospecting areas' planned end land use and closure objectives will be specified in consultation with the relevant landowner. Evidence of such consultation will be given with an application for Closure Certificate. The overall goal of the rehabilitation plan is to rehabilitate the area to as close as its pre-prospecting condition as possible. This will be accomplished through a series of established objectives:

- Ensuring that the area is safe for people and animals. This entails sealing boreholes and rehabilitating any areas that may pose a safety hazard.
- Recreating a free draining landform which entails earthworks infilling, reshaping, and levelling of all the disturbed landscapes to recreate as close as possible the original topography and to ensure a free draining landscape.
- Re-vegetation which involves either reseeding or allowing natural succession depending on the type of vegetation in the area, climate, and the landscape class; and
- Verification of rehabilitation success, which involves monitoring of rehabilitation and ensuring that area is eligible for closure.

14.2. Volumes and rate of water use required for the operation.

The water required for prospecting activities will be obtained through an arrangement with an existing authorised water user, which might be either the landowner or the local municipality. Prior to drilling, the department in responsible for water resources shall be consulted about any water-related agreement with either the landowner or the local municipality. No water will be abstracted in terms of section 21(a) of National Water Act, 1998 (Act No. 36 of 1998).

14.3. Has a water use licence been applied for?

None of the proposed planned prospecting activities fall under the scope of Section 21 of the National Water Act of 1998, (Act No. 36 of 1998). As a result, no water use licence application is required for the proposed prospecting activities.

14.4. Impacts to be mitigated in their respective phases.

Measures to rehabilitate the environment affected by the undertaking of any listed activity.

Table 20: Impacts Mitigation

Activities	Phase	Size and Scale of Disturbance	Mitigation Measures	Compliance with Standards	Time Period for Implementation
Site Clearance	- Construction - Operation	0.205 ha, short term and localized	- Minimize clearance of vegetation as much possible. In instances where it is possible, cut vegetation instead of clearing to minimize soil disturbance. - Use of hand cutting techniques wherever possible and minimise the usage of heavy machines when clearance of vegetation is undertaken to prevent soil disturbance. - Any larger fauna species discovered prior to and during vegetation clearance should be given the opportunity to relocate away from the machinery that will be used for construction and prospecting activities. - Sensitive areas should be demarcated and treated as No-Go areas. - Methods for minimizing potential harm to fauna species should be used during vegetation clearance. To maximize the potential for mobile species to move to adjacent areas, clearing must be gradual and slow, beginning from the interior of the site and continuing outwards towards the boundary. - Indigenous vegetation, even secondary communities should not be fragmented under any circumstances or further disturbed. - To avoid the spread of exotic or invasive species or the unlawful collection of plants, no plant species, whether indigenous or exotic, shall be brought into or taken from the proposed project area. - Utilize local labour if possible. - Vehicle movement should be restricted to provided access roads. - Implement alien vegetation management. - Implementing mitigation measure to prevent and manage hydrocarbon spills. - Conducting water quality and quantity monitoring. - No prospecting activities to be conducted at or near sensitive water resource areas.	NEMA MPRDA NEMBA NEMAQA Dust regulations NWA	Throughout prospecting
Site Access	- Construction - Operation	Short term and localized	- When on site, the Applicant and/or contractors must take into consideration not to interfere with current land uses and practices. - All site employees and visitors must be taken through a site induction, which includes basic environmental awareness as well as site-specific environmental requirements such as site sensitivities and appropriate protocols/procedures. Wherever possible, the Contractor's Environmental Officer should present or facilitate this induction.	NEMA OHS and MHSA	Throughout prospecting
Establishment Of site infrastructure	Operation	0.205 ha, short term and localized	- Vehicles and machinery must use existing access routes as far as possible to prevent unnecessary construction of new routes. - Ensure proper and adequate drainage. - Dust suppression should be undertaken when required to reduce the usage of water. Dust suppression strategies should be in accordance with applicable standards for PM₁₀ AND PM_{2.5}. - Ensure that prospecting is in accordance with occupational health and safety regulations.	NEMA MPRDA NEMBA NEMAQA Dust regulations NWA	Throughout prospecting process

			- All drill sites must be protected, with security access control and warning signs to ensure no person or animal can access these sites. - All laydown, chemical toilets should be restricted to least sensitive areas. - Noise must be kept to an absolute minimum during all the prospecting phases to minimize the impact of the development on the fauna that lives on the site. - Permanent structures should not be permitted on site. Buildings should preferably be prefabricated or constructed from reusable/recyclable materials. - Contractors working on the project should have spill kits available to ensure that any fuel or oil spills are cleaned up and disposed of properly.		
Storage of hazardous substances	- Construction - Operational	Short term and localized	- To prevent pollution of the environment or harm to humans or animals, all hazardous substances such as fuel, grease, oil, brake fluid, hydraulic fluid must be handled, stored, and disposed of in a safe and responsible manner. Appropriate spillage prevention measures must be implemented. - If there are any major spills of hazardous materials, they must be reported in accordance with Section 30 of the NEMA. - All chemicals and toxicants used in the construction must be stored away from sensitive areas and in a bunded area.	NWA NEMWA NEMA	Throughout prospecting process
Waste management	- Construction - Operation	Short term and localised	- Waste generated on-site must be classified and separated using the color-coding method. - Waste management must be prioritized, and all waste must be properly collected and disposed of. - Recyclable waste must not be stored on site for extended periods to prevent risk of environmental pollution. - To prevent rodents and pests from entering the site, it is recommended that all waste be removed on a weekly basis. - A Waste Management System must be put in place, with adequate waste storage in a form of covered containers, waste separation for recycling, and frequent removal of non-recyclable waste for permanent disposal at an appropriately licensed waste disposal facility. On-site waste disposal will be prohibited.	NEMWA	Throughout prospecting activities
Storage of construction vehicle	- Construction - Operation	Short term and localised	- Any equipment that may leak and is not required to be transported on a regular basis must be placed on watertight drip trays to catch any possible pollutant spills. The drip trays must be large enough to accommodate the equipment. - Drip trays must be cleaned on a regular basis and must not overflow. All spilled hazardous substances must be collected and disposed of properly at a properly licensed facility. - Soil compacting must be avoided as much as possible, and the use of heavy machinery must be restricted in areas of the intended prospecting sites. - Storage spaces must be located outside of the buffer zones.	NWA	Throughout prospecting activities
Transportation / access to and from drill sites	- Construction - Operation	short term and localized	- Drill sites should be located along existing access roads whenever possible to minimize the need for additional access roads. - All prospecting/operational and access must make use of the existing roads as far as possible. - Under no circumstances may the contractor damage any existing structures on the where the prospecting activities are to be undertaken - On-site vehicles must be restricted to approved access routes and locations on the site in	NEMA NEMBA CARA NEMAQA NWA Dust Regulations	Throughout prospecting

			order to reduce excessive environmental disturbance to the soil and vegetation on site. • Damage to public roads caused by prospecting activities must be repaired in consultation with the appropriate municipal authorities.		
Prospecting boreholes	Operation	0.1 ha, short term and localized	• To minimize the period of disturbance on fauna and flora, the duration of prospecting activities should be kept as short as possible. • To minimize the disturbance footprint, vegetation clearance for prospecting sites should be kept to a minimum. • Always adhere to approved plans to avoid encroachment on the sensitive areas. • The recommended buffer zones must be strictly adhered to. Buffer zones must be clearly demarcated and monitored as No-Go areas. • Adequate sanitary ablution facilities on the servitude must be provided for all personnel throughout the project area. • Prepare action plans and train contractors and staff in the case of spills, leaks, or other impacts to aquatic systems. • To prevent soil compaction, soil compacting must be avoided as much as possible, and the use of heavy machinery must be restricted in areas outside of the intended prospecting sites. • Dust-reducing mitigation measures must be implemented and strictly enforced, particularly for all roads and spoils. This includes watering exposed soft soil surfaces and not conducting activities on windy days, which increase the risk of dust generation. • Any potentially noisy activities or work should be undertaken at suitable times of the day. These works should not be carried out at night or on weekends. • Noise must be kept to an absolute minimum during the evenings and at night to minimize all possible disturbances to amphibian species and nocturnal mammals. • Outside lights should be directed away from sensitive environments such as wetlands. Fluorescent and mercury vapor lighting should be avoided, and instead use sodium vapor (yellow) illumination whenever possible. • To avoid migrating, nesting, and breeding seasons, prospecting activities and operations should be scheduled during the least sensitive periods. • The holes need to be sealed to ensure that no fauna species can fall in the drill hole. • On-site vehicles must be restricted to approved access routes and areas on the site in order to reduce excessive environmental disturbance to the soil and vegetation on the site. • Workforce should be kept within defined boundaries and to agreed access routes. • No invasive prospecting activities to be undertaken within 50m of a watercourse. • Should any watercourse be affected, then the necessary water use licences should be obtained from the Department of Water and Sanitation • No ablution or site laydown areas are to be located within 150m of a watercourse.	SANS 10103 Noise Regulations NEMAQA Dust Regulations NWA	Throughout prospecting and decommissioning
Borehole closure	• Decommissioning • Closure	Short term and localised	• When drilling and groundwater is encountered with, all affected prospecting boreholes that will not be required for any useful purposes should be closed and sealed with cement to minimize possible cross flow and contamination between aquifers. • Because of the very high pH of the material and the chemicals contained within cement and liquid concrete, they are hazardous to the natural environment. Consequently, the contractor must ensure that: ○ Concrete shall not be mixed directly on the ground.	NWA NEMWA NEMA	Throughout Decommissioning and Closure

			○ The visible residues of concrete, whether solid or from washings, must be physically removed and disposed of as waste as soon as possible. ○ All excess aggregate shall also be removed.		
Waste removal	Decommissioning	Short term and localised	• Excess or waste material or chemicals, including drilling muds, must be removed from the site and, if possible, recycled (for example, oil and other hydrocarbon waste products). Any waste materials or chemicals that cannot be recycled must be disposed of at a waste facility that is properly licensed.	NEMWA	Decommissioning
Surface infrastructure removal	Decommissioning	Short term and localised	• All infrastructure, equipment, and other items erected during prospecting activities shall be removed from the site. • Soil compaction should be avoided as much as possible. Heavy machinery use must be prohibited in areas outside of proposed prospecting sites to reduce soil compaction.	• MPRDA • Rehab Plan	Decommissioning
Rehabilitation	Rehabilitation	All disturbed areas	• Areas of indigenous vegetation, even secondary communities outside of the direct project footprint, should under no circumstances be fragmented or disturbed further. • Clearing of vegetation should be minimized and avoided where possible. • Maintain small patches of natural vegetation within the prospecting site to accelerate restoration and succession of cleared patches. • Areas that are denuded during prospecting 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. • All structure footprints to be rehabilitated and landscaped concurrently as the prospecting activities progress is complete. • Topsoil must also be utilised, and any disturbed area must be re-vegetated with plant and grass species which are endemic to this vegetation type. • Progressive rehabilitation will enable topsoil to be returned more rapidly, thus ensuring more recruitment from the existing seedbank. • Any woody material removed can be shredded and used in conjunction with the topsoil to augment soil moisture and prevent further erosion	• NEMA • OHS and MHSA • MPRDA Rehab Plan	Decommissioning
Consultation	• Planning • Construction • Operation	Medium term, localised	• Stakeholder engagement will continue throughout the prospecting process to ensure that the community and landowners are kept informed and could address their concerns.	• NEMA	Throughout Planning, construction and operation

14.5. Impact Management Actions and Outcomes

Table 21: Impact management actions and outcomes.

Activity	Potential impact	Aspects affected	Phase	Mitigation type	Standard to be achieved
Site Clearance	- Deterioration and damage to existing access roads and tracks - Dust generation - Clearance of vegetation - Invasion by alien species - Soil erosion and compaction - Impact on Flora and Fauna - Impact on heritage resources	- Topography - Soil - Air Quality - Surface Water - Groundwater - Transportation - Visual receptor - Heritage resources	- Construction - Operation	Avoid and control through implementation of EMPr mitigation measures such as speed limit enforcement and vehicle maintenance	- NEMA - NEMBA - CARA - Threatened or Protected Species (TOPS) regulations - NEMAQA - Dust regulations - NWA - NHRA
Storage of construction vehicles	- Soil compaction - Contamination of surface and ground water - Spillage of oils, fuels, and chemicals - Soil contamination or pollution	- Surface water - Groundwater - Soils	- Construction - Operation	- Avoid through implementation of EMPr mitigation measures such as communication with landowners. - Control through implementation of ESMS	- NWA - DWAF best Practice Guidelines - NEMA
Storage of hazardous substances	Spillage of oils, fuels, and chemicals	- Surface water - Groundwater - Soil - Pollution	- Construction - Operation	Avoid through implementation of EMP mitigation measures	- NEMA - NEMBA - NWA
Waste management	Generation and disposal of waste	Pollution	- Construction - Operation	Avoid through implementation of EMPr mitigation measures	- NEMA - NEMWA
Transportation to and from drill sites	- Disturbance and Loss of fauna and flora - Wear and tear of existing roads - Dust generation from increased traffic.	- Fauna and Flora - Air quality	- Construction - Operation - Decommissioning	Avoid and control through implementation of EMPr mitigation measures such as speed limit enforcement, vehicle maintenance.	- NEMA - NEMBA - CARA - Threatened or Protected Species (TOPS) regulations - NEMAQA - Dust regulations - NWA
Prospecting boreholes	- Vegetation clearance - Removal of topsoil - Land use conflict - Dust generation	- Ecology - Topography - Access/footprint - Soil disturbance - Noise	- Construction - Operation - Decommissioning	Control through implementation of EMPR mitigation measures	- SANS10103 - Noise Regulations - NEMAQA - Dust regulations - NWA

	- Disturbance of wildlife and communities in close vicinity - Damage to local roads - Disturbance or damage of terrestrial biodiversity resources - Influx of people who are seeking jobs. - Wastewater discharge - Spillage and leaks of hydrocarbons and Waste disposal. - Disruption of the heritage resources	- Air Quality - Socioeconomics - Groundwater - Heritage resources			NHRA
Borehole closure	Erosion due to removal of vegetation and topsoil. .	Erosion	Rehabilitation and Closure	Control through implementation of EMPr mitigation measures	- NEMA - NEMBA - NWA
Rehabilitation	- Erosion - Loss of habitat - Disturbance to wildlife and communities in close vicinity	- Topography - Land use - Soil disturbance - Ecology	Rehabilitation	Control through implementation of EMPr mitigation measures	MPRDA in accordance with Rehabilitation plan
Monitoring of rehabilitated sites	- Erosion - Disturbance to flora and fauna.	- Topography - Land use - Soil - Disturbance of Ecology	Post-closure	Control through adhering to monitoring requirements	MPRDA and regulations

15. Financial Provision

15.1. Determination of the amount of Financial Provision

15.1.1 Describe the closure objectives and the extent to which they have been aligned to the baseline environment described under the Regulation.

The general goals of the prospecting closure include securing beneficial and widely agreed-upon post-prospecting land uses. Removal of all generated wastes constructed infrastructure, and materials, re-vegetation of disturbed and cleared areas, rehabilitation of access roads to ensure the growth of existing grasses and plant species, and clean-up of hydrocarbon spillages should all form part of the closure plan. The following are the primary closure objectives:

- All existing structures and facilities are physically stable, capable of withstanding foreseeable environmental conditions and events, pose no threat to health and safety, and perform their intended long-term functions.
- Contaminants must not be released or transported from the site at levels that are hazardous to human health or biota, or that are otherwise unacceptable.
- The biological environment is restored to a natural, balanced, self-sustaining ecosystem that compatible with the planned post-prospecting land use. Other closure measures must create physical, chemical, and hydrological conditions that allow for such long-term ecosystems.
- Ensure that the site has been made visually appealing.
- Closure of the prospecting activities must ensure the quantity and quality of the site's natural resources.
- Maximize the desired post-prospecting land use.
- Mechanisms for post-closure monitoring are in place for the outstanding liability and risks.

15.1.2. Confirm specifically that the environmental objectives in relation to closure have been consulted with landowner and interested and affected parties.

This Basic Assessment Report and Environmental Management Programme will be made available to each registered stakeholder for review and comment. All comments will be captured in the CRR and included into the report.

15.1.3. Provide a rehabilitation plan that describes and shows the scale and aerial extent of the main mining activities, including the anticipated mining area at the time of closure.

Because of the nature of the activities, the impacts will be confined and temporary. The management programme is created in such a manner that concurrent rehabilitation is attainable. Following the completion of planned invasive activities, Molobedu Makoweni will ensure that the site is returned to its former state by carrying out the following measures:

- Decommissioning of all infrastructures that were used on site during the prospecting activities.
- The whole drill site will be inspected for any signs of hydrocarbon spillages. Any identified soil which has been polluted because of the drilling activities will be remedied and waste disposed of in a registered landfill site.
- Ensure that no waste material (plastics, papers, pipes) is left behind on the drill site.
- Any area compacted because of the drill rig will be ripped and any furrows created by accessing or leaving the site for the drilling activity will be filled in to ensure that no future erosion shall occur on site.

15.1.4. Explain why it can be confirmed that the rehabilitation plan is compatible with the closure objectives.

The impacts will be limited and temporary due to the nature of the activities. The management strategy is structured in such a way that concurrent rehabilitation is possible. The most impacted areas will be those where drilling will take place. The activities in this case will be temporary, and a detailed management programme has been developed to address any potential consequences.

15.1.5. Calculate and state the quantum of the financial provision required to manage and rehabilitate the environment in accordance with the applicable guideline.

A financial provision of approximately **R44854.00** has been budgeted for the prospecting programme over eight (8) years, for rehabilitation activities.

The financial provision calculations were undertaken in terms of the guidelines provided within the “DMR Guideline Document for The Evaluation of The Quantum of Closure-Related Financial Provision Provided by a Mine” (DMR, 2005). The closure components for the prospecting activities are summarised on the table.

15.1.6. Confirm that the financial provision will be provided as determined.

Should Prospecting Right be granted, Molobedu Makoweni (Pty) Ltd will make provision for the estimated closure cost by means of a Bank Guarantee or any other means available and accepted by the Competent Authority.

16. Mechanisms for monitoring compliance with and performance assessment against the environmental management programme and reporting thereon, including

16.1. Monitoring of Impact Management Actions

16.2. Monitoring and reporting frequency

16.3. Responsible persons

16.4. Time period for implementing impact management actions

16.5. Mechanism for monitoring compliance

Table 22: Compliance Monitoring and Frequency

Source Activity	Impacts Requiring Monitoring Programmes	Functional Requirements for Monitoring	Roles and Responsibilities	Monitoring and Reporting Frequency and Time Periods for Implementation
Desktop studies and acquisition of historic data	None	None	None	None
Geological field mapping	None	None	None	None
Remote sensing and Geophysical Surveys	None	None	None	None
Site establishment -Vegetation clearance -Alien vegetation removal -Vehicle and equipment movement -Placing of infrastructure	- Disturbance of Flora and Fauna. - Impacts on soils and land capability. - Contamination of water resources and deterioration of water quality	- Document control. - Site Inspections and checklists; and - Report reviews and Development of actions plans	- Contractors Environmental Representative. - Environmental specialist, ECO; and - Senior Environmental Management Officer	- Control of documents, site visit and reporting. - Monthly site visits. - Monthly Reports; and - Annual Performance Assessment

	• Groundwater quality deterioration. • Noise and dust generation; and • Visual and topography disturbance			
Target Prospecting Boreholes	• Alien vegetation management. • Noise nuisance. • Air quality due to dust generation; and • Surface and groundwater management	• Site Inspections and checklists; • Report reviews and development of corrective action plans. • Inspection of surface water features; and • Survey of groundwater users and use within 5km of the invasive prospecting sites.	• Contractors Environmental Representative. • Environmental specialist. • ECO. • Senior Environmental Management; and • Geohydrologist (if required)	• Control of documents site visit and reporting. • Monthly site visits. • Monthly Reports Annual Performance; and • Prior to invasive prospecting activities and monitoring post-prospecting.
Ablutions - Chemical Toilets	• Groundwater contamination; and • Health impacts on workers	• Site Inspections and checklists	• Contractor Environmental Representative	• Daily inspections and checklists
Access Route (Existing roads to be utilised)	• Dust generation	• Site Inspections and checklists	• Contractors Environmental Representative	• Monthly inspections and checklists
Temporary general waste storage (General/domestic waste)	• Visual disturbances; • Soils contamination; and	• Site Inspections and checklists	• Contractors • Environmental	Monthly inspections and checklists

	• Surface water and Groundwater contamination		Representative	
Temporary hazardous waste storage (Hazardous waste – Sealed Container)	• Surface water and groundwater contamination; and • Soils contamination	• Site Inspections and checklists	• Contractors • Environmental Representative	Weekly inspections and checklists
Undertake decommissioning and rehabilitation as per the rehabilitation plan	• Alien vegetation management. • Fire management plan. • Noise generation; and • Air quality	• Site Inspections and checklists; and • Report reviews and development of corrective action plans	• Contractors Environmental Representative. • Environmental specialist, ECO; • Senior Environmental Management Officer; and • Surface water specialist	• Monthly site visits; and • Monthly Reports and Annual Performance Assessments
Monitoring of rehabilitation efforts	• All Impacts Identified in the EMPr	• Site Inspections and checklists	• ECO; and • Independent Environmental Auditor	• Monthly reports

17. Indicate the frequency of the submission of the performance assessment/ environmental audit report.

Annual environmental performance audit report will be undertaken alternating between internal and independent EAP after the granting of the authorisation. It requires the holder of the authorisation to ensure compliance with all the conditions of the EA and/or the EMPr, and of which the conduct of the proposed activities must be audited against these conditions. It is also recommended that an internal audit specified in the previous section be carried out on an annual basis, at least before the independent audit. This audit report must then be submitted to the competent authority. This audit report must adhere to the following conditions:

- Be prepared by an **independent** person with the relevant environmental auditing expertise.
- Provide verifiable findings, in a structured and systematic manner, on-
 - (i) the level of performance against and compliance of an organization or project with the provisions of the requisite environmental authorisation or EMPr and, where applicable, the closure plan; and
 - (ii) the ability of the measures contained in the EMPr, and where applicable the closure plan, to sufficiently provide for the avoidance, management and mitigation of environmental impacts associated with the undertaking of the activity.
- Contain the information set out in Appendix 7 of GN R. 326; and
- Be conducted and submitted to the competent authority at intervals as indicated in the environmental authorisation.

The purpose of this audit report is also defined in the regulations and is as follows:

- Determine the ability of the EMPr, and where applicable the closure plan, to sufficiently provide for the avoidance, management and mitigation of environmental impacts associated with the undertaking of the activity on an ongoing basis and to sufficiently provide for the avoidance, management and mitigation of environmental impacts associated with the closure of the project area; and
- Determine the level of compliance with the provisions of environmental authorisation, EMPr and where applicable the closure plan.

18. Environmental Awareness Plan and Training.

Training and environmental awareness is an integral part of a complete EMPr. The overall aim of the training will be to ensure that all site staff are informed of their relevant requirements and obligations pertaining to the relevant authorizations, licenses, permits and the approved EMPR and protection of the environment.

The applicant and contractor must ensure that all relevant employees are trained and capable of carrying out their duties in an environmentally responsible and compliant manner and can comply with

the relevant environmental requirements. To obtain buy-in from staff, individual employees need to be involved in:

- Identifying the relevant risks.
- Understanding the nature of risks.
- Devising risk controls; and
- Given incentive to implement the controls in terms of legal obligations.

The applicant shall ensure that adequate environmental training takes place. All employees shall be given an induction presentation on environmental awareness. Where possible, the presentation needs to be conducted in the language of the employees. All training must be formally recorded, and attendance registers retained. The environmental training should, as a minimum, include the following:

- General background and definition to the environment.
- The importance of compliance with all environmental policies.
- The environmental impacts, actual or potential, of their work activities.
- Compliance with mitigation measures proposed for sensitive areas.
- The environmental benefits of improved personal performance.
- Their roles and responsibilities in achieving compliance with the environmental policy and procedures and with the requirement of the applicant's environmental management systems including emergency preparedness and response requirements.
- The potential consequences (legal and/or other) of departure from specified operating procedures.
- The mitigation measures required to be implemented when carrying out their work activities.
- Discussions are required on sensitive environmental receptors within the project area to inform contractors and site staff of the presence of Red / Orange List species, their identification, conservation status and importance, biology, habitat requirements and management requirements of the Environmental Authorisation and within the EMPr; and
- All operational risks must be identified, and processes established to mitigate such risk, proactively. Thus, the applicant needs to inform the employees of any environmental risks that may result from their work, and how these risks must be dealt with to avoid pollution and/or degradation of the environment.

In the case of new staff (including contract labour) the contractor / applicant shall keep a signed register of attendance for proof and record of adequate environmental induction training.

18.1. Manner in which the applicant intends to inform his or her employees of any environmental risk which may result from their work.

Environmental awareness could be fostered by induction course for all personnel on site, before commencing site visits. Personnel should also be alerted to environmental concerns associated with their tasks for the area in which they are working. Courses must be given by suitably qualified personnel and in a language and medium understood by personnel. The environmental awareness training programme will include the following:

- Occupational Health and Safety Training (OHS)
- Environmental Awareness Training on EMPr management actions.

Environmental awareness training will focus on the following specific aspects and be undertaken in “Toolbox talk “topics prior to site access:

- Waste collection and disposal.
- Sensitive environmental receptors.
- Identification of Red/ Orange List species, conservation status and importance, biology, habitat requirements and management requirements of the environmental authorisation and EMPr; and
- EMPr management options and application.

18.2. Manner in which risks will be dealt with to avoid pollution or degradation.

The broad measures to control or remedy any causes of pollution or environmental degradation because of the proposed prospecting activities taking place are provided below:

- Contain potential pollutants and contaminants (where possible) at source.
- Handling of potential pollutants and contaminants (where possible) must be conducted in bunded areas and on impermeable substrates.
- Ensure the timeous clean-up of any spills.
- Implement a waste management system for all waste stream present on site; and
- Investigate any I&AP claims of pollution or contamination because of prospecting activities

It is of critical importance that the broad measures to control or remedy any causes of pollution or environmental degradation are applied during onsite prospecting activities.

19. Specific information required by the Competent Authority

(Among others, confirm that the financial provision will be reviewed annually).

In accordance with the provisions of Regulation 23(3) of the EIA 2014 Regulations (as amended) the EIA should include all information required as set out in Appendix 3 and in terms of Regulation 23(4) the Environmental Management Plan (EMP) should contain all information required as set out in Appendix 4. The EIA report must include the following:

- Details of the EAP who prepared the report and the expertise of the EAP, including a

curriculum vitae.

- A plan, which locates the proposed activity or activities applied for as well as the associated structures and infrastructure at an appropriate scale.
- A description of the scope of the proposed activity.
- A description of the policy and legislative context within which the development is located, and an explanation of how the proposed development complies with and responds to the legislation and policy context.
- A motivation for the need and desirability for the proposed development, including the need and desirability of the activity in the context of the preferred location.
- A full public participation process including a CRR in the BAR.
- Impact Assessment, including methodology, of the necessary environmental aspects, including the nature, significance, extent, duration, and probability of the impacts occurring, positive and negative impacts, including mitigation and monitoring measures.
- An assessment of the proposed alternatives.
- A complete EMPr.
- The financial provision for the environmental liability which will be reviewed annually.
- An impact statement from the EAP, specific information the Competent Authority may require, and conditions for approval; and
- An EAP oath regarding the correctness of information provided in the report.

20. UNDERTAKING

The EAP herewith confirms.

- the correctness of the information provided in the reports; ☒
- the inclusion of comments and inputs from stakeholders and I&APs; ☒
- the inclusion of inputs and recommendations from the specialist reports where relevant; and
- that the information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested and affected parties are correctly reflected herein ☒.



Signature of the environmental assessment practitioner:

Vahlegwe Mining Advisory and Consulting (Pty) Ltd

Name of company:

11 April 2026

Date:

Appendix 1:

CVs of the EAP

SUNDAY MISHACK MABASO

12 Thaxted Ave Mulbarton 2190 · Tel ; 011 432 0062 Cel: 074 569 7312 & 082 461 4251
Email - sunday@vahlengweadvisory.co.za · LinkedIn Profile - Sunday Mabaso ·X @SundayMabaso

BIOGRAPHY

Mr. Sunday Mabaso is the founder and CEO of Vahlengwe Mining Advisory and Consulting established in April 2021 to provide a broad range of services in the mining industry ranging from application of mineral rights, environmental and waste management, water use licensing, community engagements to compliance monitoring in terms of the MPRDA, MHSA, NEMA, NWA amongst other legislation governing the mining industry. He's got over 30 years mining experience including 20 years (2000 – 2021) with the Department of Mineral Resources and Energy (DMRE) where he served his last seven years as Regional Manager (3 years in Northern Cape and 4 years in Gauteng) before his resignation to advance his career in business. His areas of expertise include Environmental Management, Mining Legislation, Mine Economics, and Social and Labour Plans and community engagements. He contributed to various strategic committees, task teams in the South African Mining industry including "Mining Phakisa" in 2015, the development of the "South Africa's Exploration Implementation Plan" published by Minister of Mineral Resources and Energy in 2022.

He started his mining career in 1994 where he proceeded to attain a National Diploma in Mine Surveying and a National Higher Diploma in Mineral Resource Management from Technikon Witwatersrand in 1999 and 2000 respectively, a Graduate Diploma (GDE) in Mining Engineering from University of Witwatersrand in 2009 and a Master of Business Administration (MBA) from Milpark Business School in 2021. Sunday also completed a Post Graduate Certificate in Climate Change and Energy Law from University of the Witwatersrand in 2021, a Certificate in Energy Efficiency and Sustainability from the University of Cape Town (UCT) in 2022 and Certificate in Mine Closure and Land Rehabilitation from University of Pretoria (UP) in 2022.

Sunday is a registered member of the Institute of Directors of South Africa (IoDSA), the Southern Institute of Mining and Metallurgy (SAIMM) and is an Environmental Assessment Practitioner registered with EAPASA, also a member of the International Association of Impact Assessment South Africa (IAIASa). A committee member of the Environmental, Social and Governance (SAMESG) working group of the SAMCODES Standard Committee (SSC) responsible for developing the South African Mineral Reporting Codes. He has authored opinion and journal articles about South African mining legislation with interests focused on social and

environmental impacts on mine communities affected by mining operations, past and present. Some of his articles are published in academic journals and books internationally.

ACADEMIC JOURNAL PUBLICATIONS

Mabaso SM. (2025) The impact of gold mine closures and future planning for sustainable development in the Witwatersrand Goldfields: Mine Closure Conference 2025, 19-20 February 2025, The Southern Institute of Mining and Metallurgy: ISBN 9781-1-7764673-8-9

Mabaso, SM. (2023) Legacy Gold Mine Sites & Dumps in the Witwatersrand: Challenges and Required Action. Natural Resources, 14, 65-77. <https://doi.org/10.4236/nr.2023.145005>

Mabaso, SM. (2023). Social and Environmental Challenges caused by Legacy Gold Mining in Johannesburg: Government's Action Plan. eBook: ISBN: 978-81-19491-53-7. DOI: 10.9734/bpi/npgees/v9/10672F

Ramontja, T. and Mabaso, S. 2022. Evolution of South Africa's Mining Regulatory Framework as it Relates to the Empowerment and Participation of Mining Communities. https://doi.org/10.1007/978-3-031-07048-8_6

PROFESSIONAL AFFILIATIONS

- The Southern Institute of Mining and Metallurgy (SAIMM) No 709244
- EAPASA: Environmental Assessment Practitioner (EAP) No 2022/4485
- International Association of Impact Assessment South Africa (IAIAsa) No 7442
- Institute of Directors in South Africa (M.Inst.D, 69334063)
- Land Rehabilitation Society of Southern Africa (LaRSSA)
- International Society for Development and Sustainability (ISDS)

COMMITTEES

- South African Mineral Reporting Codes (SAMCODES) Standards Committee, 2016 to 2021
- SAMCODES-ESG Subcommittee – 2021 to date

EXPERIENCE

01 MAY 2021 – DATE

FOUNDER AND PRINCIPAL CONSULTANT: VAHLENGWE MINING ADVISORY AND CONSULTING
CORE SERVICES

- MPRDA and NEMA
- Mining Charter
- Environmental, Social and Governance - ESG
- Mine Closure and Rehabilitation
- Waste Management
- Community engagements
- Compliance Inspections

- Assistance to junior and small-scale miners

01 AUGUST 2014 – 30 APRIL 2021

REGIONAL MANAGER, DEPARTMENT OF MINERAL RESOURCES AND ENERGY

(NORTHERN CAPE –AUGUST 2014 TO APRIL 2017 AND GAUTENG – MAY 2017 TO APRIL 2021)

- Effective implementation and administration of the MPRDA
- Implementation and administration of Environmental Management policies and regulations in terms of NEMA and NEM: Waste Act
- Implementation and administration of Social and Labour Plans in terms of MPRDA
- Evaluation of Mining and Prospecting Work Programs and monitoring compliance
- Management of Land Use in mining areas to promote development and coexistence.
- Management of community development through implementation of the Mining Charter
- Promoting participation of Historically Disadvantaged South Africans in the mining economy and the value chain
- Management of relations and conflict resolutions between mining communities and mining companies
- Management of Financial and Administrative systems and procedures in the Regional Office
- Provide support and advisory to the Deputy Director General in the department

01 APRIL 2007 – 31 JULY 2014

DEPUTY DIRECTOR: MINE ECONOMICS, DEPARTMENT OF MINERAL RESOURCES

- Evaluating Mining/Prospecting Work programs for mineral rights applications and monitoring sustainability of mining operations in line with the MPRDA objectives.
- Conduct mine asset valuations for tax purposes and transfer of mining operations.
- Monitor compliance through inspections and issuing of compliance directives.
- Assisting junior coal miners to access export markets through the Quattro Task team.
- Assist new entrants and junior miners in the mining industry.

01 DECEMBER 2000 – 31 MARCH 2007

INSPECTOR OF MINES, DEPARTMENT OF MINERALS AND ENERGY

- Monitor compliance with the Mine Health and Safety Act in the mines.
- Provide technical advice on conflict between land development and mining operations.

25 JANUARY 2000 – 30 NOVEMBER 2000

SENIOR MINE SURVEYOR AND JUNIOR MINE PLANNER, TAVISTOCK COLLIERIES

05 AUGUST 1994 – 31 DECEMBER 2000

LEARNER OFFICIAL AND BURSAR, TAVISTOCK COLLIERIES

EDUCATION

JUNE 2022 TO NOVEMBER 2022

CERTIFICATE: MINE CLOSURE AND LAND REHABILITATION, UNIVERSITY OF RETORIA (UP)

- Closure Design
- Regional Planning considerations and operational mitigation
- Land preparation and soil management
- Land cover/surface stabilization-economic value
- Maintenance and land management systems
- Identifying closure planning challenges and problem areas
- Mine closure planning consideration

- Closure documents required Baseline environment and closure risks
- Closure success criteria and rehabilitation monitoring
- Financial provisioning and social planning

OCTOBER 2021 TO DECEMBER 2021

CERTIFICATE: ENERGY EFFICIENCY AND SUSTAINABILITY, UNIVERSITY OF CAPE TOWN (UCT)

- Energy-importance, Strategy and Challenges
- Energy Metrics, Economics and Efficiency
- Energy-efficient and Sustainable Buildings
- Energy-efficiency management and technologies in buildings
- Energy-efficiency management and technologies in industrial sector
- Energy auditing
- Energy Measurement Verification and Management Systems

MARCH 2021 TO JULY 2021

POST GRADUATE CERTIFICATE: CLIMATE CHANGE AND ENERGY LAW, UNIVERSITY OF WITWATERSRAND

- Climate Change and Energy
- Energy Law Concepts and Economics
- Theories of Energy and Climate Regulation
- Sources of Energy: Fossil Fuels
- Sources of Energy: Petroleum Sector
- Sources of Energy: Gas Sector
- The South African Electricity Supply Industry
- Climate Change Law and Policy Framework
- Energy, Climate Change & Just Transition
- Nuclear as a Source of Electricity
- Energy Efficiency and Demand Side Management
- Regulation of Energy Procurement

FEBRUARY 2018 TO JULY 2021

MASTER OF BUSINESS ADMINISTRATION, MILPARK BUSINESS SCHOOL

- Advanced Business Research Methodology
- Business Ethics and Corporate Governance
- Business in Emerging Markets
- Business Report Writing, Quantitative Analysis and Presentation Skills
- Dissertation
- General Management Environment
- Global Trade (Macro-economic – BRICS – Developing Markets)
- Integrated Business Strategy
- Leadership and Change Management
- Management Accounting and Finance (part 1)
- Management Accounting and Finance (part 2)
- Marketing and Sales Management
- Operations and Technology Management
- People Management
- Social Responsibility and Environmental Management

OCTOBER 2014 TO JANUARY 2015

**CERTIFICATE IN BASIC TRAINING FOR ENVIRONMENTAL MINERAL RESOURCE INSPECTORS,
UNIVERSITY OF PRETORIA**

- Constitutional Background
- NEMA and MPRDA framework legislation
- Sustainable Development Principles
- EIA process, Scoping reports, and review of EA applications and Integrated EAs
- NEMA: WASTE Act
- The National Water Act
- The Biodiversity Act
- Administrative Law
- Criminal Enforcement
- Special forms of Liability
- Powers of Environmental Mineral Resources Inspectors-EMRI
- Ethics, Health and Safety and relevant issues
- Sampling
- Inspections
- Investigations
- Appeals
- Exemptions and exceptional circumstances

MARCH 2006 TO NOVEMBER 2008

GRADUATE DIPLOMA IN MINING ENGINEERING, UNIVERSITY OF WITWATERSRAND

- Mineral Economics
- Mineral Policy and Investment
- Compliance and Reporting Rules in the Mining Industry
- Economic Geology of South African Coal
- Coal extraction and Exploitation
- Coal and the Environment

JULY 1999 TO JULY 2000

**NATIONAL HIGHER DIPLOMA, MINERAL RESOURCE MANAGEMENT, TECHNIKON
WITWATERSRAND**

- Mineral Engineering Management IV
- Mine Survey IV
- Mine Planning IV
- Mine Valuation IV
- Experiential Training

JULY 1996 TO MAY 1999

NATIONAL DIPLOMA, MINE SURVEYING, TECHNIKON WITWATERSRAND

SKILLS

- In-depth understanding of mine planning, valuation and mining economic value chain,
- Good communication skills
- Conflict resolution

- In-depth understanding of the regulatory and compliance regime in the mining industry
- Good decision making
- Ability to work under pressure.
- Time management
- Good Leadership and management

PERSONAL INFORMATION

I'm a male South African Tsonga speaking citizen, born on 29 November 1976 in Bushbuckridge, Mpumalanga Province where I started my primary schooling at Mpikaniso Primary school in 1983 and matriculated at Orhovelani High School in 1993. I'm currently married with four children and have been residing in Mulbarton, Johannesburg South since June 2017.

PERSONAL HOBBIES

My personal hobbies include playing golf, watching, and following soccer, rugby, and other national sporting codes. Mentoring my kids through schoolwork and sport. I spend more time outside work with my family to groom my kids to become better citizens and leaders of the future generation.

REFERENCES

Mr Mosa Mabuza
Chief Executive Officer
Council for Geoscience
012 841 1911
082449 8650
mmabuza@geoscience.org.za

Dr Thibedi Ramontja
Former Director General: DMRE
Currently Director: School of Mining
University of Witwatersrand
083 388 9122
thibedi.ramontja@wits.ac.za /
Ramontja2@gmail.com

Dr Tania Marshall
Director: School of Mining
University of Witwatersrand
082 611 3388
marshall.tania@gmail.com

**Environmental Assessment
Practitioners Association
of South Africa**



Registration No. 2022/4485

**Herewith certifies that
SUNDAY MISHACK MABASO
is registered as an**

Environmental Assessment Practitioner

**Registered in accordance with the prescribed criteria of Regulation 15. (1)
of the Section 24H Registration Authority Regulations
(Regulation No. 849, Gazette No. 40154 of 22 July 2016, of the
National Environmental Management Act (NEMA), Act No. 107 of 1998, as amended).**

Effective: 01 April 2026

Expires: 31 March 2027

Chairperson

Registrar



BRUNELLA KHANYILE MGIBA-MUTERO

073 692 2359 | khanyilemgiba07@gmail.com

Personal Profile

Khanyile is a highly motivated and detail-oriented Environmental Consultant with practical experience in conducting environmental impact assessments, environmental compliance audits, mine closure applications, and water use license submissions. She is committed to promoting sustainable development and is passionate about advancing environmental protection through sound environmental management practices.

Her achievements include ensuring effective compliance monitoring and enforcement in line with South African environmental legislation, with a strong working knowledge of the Mineral and Petroleum Resources Development Act (MPRDA), the National Environmental Management Act (NEMA), and related Strategic Environmental Management frameworks.

She understands EIA Regulations, Waste Management, and Air Quality legislation, and has successfully supported the implementation of Section 24G processes in terms of both Act No. 8 of 2004 and Act No. 62 of 2008, specifically as it relates to unlawful commencement of listed activities under Sections 24F and 7 or 12(3).

Key Skills

- Environmental Impact Assessments (BAR & S&EIR)
- Environmental Management Plans/Programmes (EMPrs)
- Water Use License Applications (WULA)
- Environmental Compliance Auditing
- Mine Closure Applications
- Report Writing & Technical Documentation
- Stakeholder Engagement & Communication
- Environmental Legislation (NEMA, NWA, MPRDA, NEMWA)
- GIS (basic proficiency)
- Filing & Project Administration

Professional Experience

Vahlengwe Mining Advisory and Consulting

Environmental Consultant

February 2023– Present [2 years and 4 months]

Responsibilities:

- Conducted EIAs (BAR & S&EIR) and compiled EMPs for mining and prospecting rights.
- Prepared Water Use License Applications in accordance with regulatory requirements.
- Participated in environmental and mining compliance audits
- Maintained a structured project filing system for audits and internal tracking.
- Liaised with clients and provided ongoing updates on project progress.

Project Experience as Compiler

Gomeza Trading (Pty) Ltd. NC 30/5/1/1/2/ 13760 PR

Prospecting Right Application for Tin, Nickel, Zinc, Lithium, Cobalt, Lead on the farm Severn No. 36 in Kuruman, Northern Cape Province.

Khutso Naketsi Communal Property Association (CPA). NW 30/5/1/1/2/14411 PR

Prospecting Right for gold in multiple portions on farm Scheerpoort 477 JQ in Brits North-West Province.

ATNM (Pty) Ltd. GP 30/5/1/3/2/10393 MP

Application for Mine Closure Certificate for a gold ore mining permit issued in respect of portion of portion 3, farm Vlakfontein 69 IR the Magisterial district of Benoni, Gauteng Province.

Barzani Mining (Pty) Ltd. NW 30/5/1/3/2/10778 MP

Mine Closure Certificate for chrome mining permit of a portion at farm Tweelaagte 175 JP in Mankwe, North-west Province.

Saqondisana Investment (Pty) Ltd. KZN 30/5/1/1/2/11694 PR

Prospecting Right Application for Coal of the farms including Mthembu, Lotmga, Kaisha, Osaka within the Estcourt District in Kwa-Zulu Natal Province.

Saqondisana Investment (Pty) Ltd. KZN 30/5/1/1/2/11861 PR

Prospecting Right for chrome, manganese, coal, gold of the farms including Fuleni Reserve, Mhlana (King Cetshwayo District) in Kwa-Zulu Natal Province.

Achievements

- Ensure compliance monitoring and Enforcement of South African Environmental Legislations.
- Good understanding of Mineral and Petroleum Resources Development Act, National Environmental Management Act and Strategic Environmental Management Acts
- Good understanding of Environmental Impact Assessment, Waste Management and Air Quality Regulations.
- The implementation of Section 24G read with S24F and 7 of NEMA (Amendment) (Act No 8 of 2004) and Section 24G read with S24F and 12(3) of NEMA (Amendments) (Act 62 of 2008)

Professional Registration

Candidate Environmental Assessment Practitioner (EAP) –Reference No: 2025/19982

SACNASP Student (169444)

Education

Higher Certificate in Life and Environmental Science [NQF Level 5]

University of South Africa [UNISA]

Completed – 2022

Bachelor of Arts in Environmental Management

University of South Africa [UNISA]

In Progress – 3rd year [to be completed in 2026]

Reference

Cecil Dau Senior Consultant [Vahlengwe Mining Advisory and Consulting]

076 267 0743

**Environmental Assessment
Practitioners Association
of South Africa**



Registration No. 2025/19982

Herewith certifies that

BRUNELLA KHANYILE MGIBA-MUTERO

is registered as an

Candidate Environmental Assessment Practitioner

**Registered in accordance with the prescribed criteria of Regulation 15. (1)
of the Section 24H Registration Authority Regulations
(Regulation No. 849, Gazette No. 40154 of 22 July 2016, of the
National Environmental Management Act (NEMA), Act No. 107 of 1998, as amended).**

Effective: 01 April 2026

Expires: 31 March 2027

Chairperson

Registrar



Appendix 2: Locality map and Regulation 2 (2)

The prospecting right application area in respect of the Farms
LOT 289 EMPANGENI 13389 GU AND LOT 285 EMPANGENI 13400
GU, within King Cetshwayo District Municipality, KwaZulu-Natal.



Bukhanana

KwaMbonambi

Empangeni

Richard's Bay



Legend

● Nearest Towns

□ Prospecting Right area

0 2,3 4,6 9,2 13,8 18,4 Kilometers

28°32'30"S

28°37'25"S

Diagram A- I represents the prospecting right area, in respect of the Farms LOT 289 EMPANGENI 13389 GU and LOT 285 EMPANGENI 13400 GU, in the King Cetshwayo District Municipality, KwaZulu-Natal Province.
A - B and E - F are long the Rivers.
1,160.0 ha



Molobedu Makoweni (Pty) Ltd

THE APPLICATION OF THE PROSPECTING RIGHT IN TERMS OF SECTION 16 OF THE MINERAL AND PETROLEUM RESOURCES DEVELOPMENT ACT, 2002 (ACT 28 OF 2002)

Legend

● Points location

■ Prospecting Right Area

Plan Approval

Applicant

Signature:.....

Date:.....

Surveyor

Signature:.....

Date:.....

Regional Manager

Signature:.....

Date:.....

Text



PREPARED BY



Johannesburg South

Help Desk Tel +27 (0) 11432 0062

230 Voster Ave Street Tel +27 (0) 11432 0062

Glenvista 2058 Email info@vahlangweadvisory.co.za

LIABILITY CLAUSE:

This map was compiled from a variety of data sets, and Vahlangwe Advisory does not accept any responsibility for the accuracy of the data.

Coordinate System: WGS 84

Name	POINT_X	POINT_Y
A	31,79426	-28,56054
B	31,80780	-28,55396
C	31,81145	-28,56281
D	31,82458	-28,57966
E	31,85060	-28,59028
F	31,85573	-28,59221
G	31,83001	-28,60772
H	31,81444	-28,58829
I	31,81001	-28,57909

0 0,63 1,25 2,5 3,75 5 Kilometers

31°49'35"E

Appendix 3:

Public Participation Process

Draft BAR
Molobedu Makoweni (Pty) Ltd
KZN 30/5/1/1/2/12129 PR



Appendix 3A:

Proof of newspaper advert

NOTICE IN TERMS OF SEC. 35

In the estate of the late VUSO ZEBLON VICTOR KUZWAYO Estate No: 3707/2022 Identity number: 430226 5453 08 0 Of: 12 MVUTSHINI AREA, HEMFANE, GINGINDLOVU,3800 Notice is hereby given in terms of Section 35 of the Deceased Estate Act that the First and Final Liquidation and Distribution Account will lay open for inspection at the Office of the Master of the High Court PIETERMARITZBURG as well as the Magistrate Court MTUNZINI for a period of 21 days as from the 10TH of APRIL 2026 Dated at BLOEMFONTEIN on this 23RD day of MARCH 2026.

JOHAN RAATH AGENT ON BEHALF OF EXECUTOR JOHAN RAATH ATTORNEYS 7 COLLINS ROAD ARBORETUM BLOEMFONTEIN TEL: 051 013 3444

10-04-2026

SR015393

NOTICE OF A BASIC ASSESSMENT (BA) PROCESS FOR THE PROPOSED EXPANSION OF AN EXISTING FUEL STORAGE FACILITY ON PORTION 1 OF ERF 16177, UMHLATHUZE LOCAL MUNICIPALITY, KING CETSHWAYO DISTRICT MUNICIPALITY

Bay Diesel Depo, the Applicant, is proposing an expansion of their current fuel storage facility on Portion 1 of Erf 16177. Currently approximately 74 000 litres of fuel are being stored in three (03) above-ground tanks. The Applicant is proposing to increase this capacity to approximately 480 000 litres to cater for the increase in demand. The expansion of the fuel storage facility will also consist of above-ground tanks to minimise environmental impact.

Environmental Authorisation Process Exigent Engineering Consultants have been appointed as the Environmental Assessment Practitioner (EAP) to undertake the EIA and the Public Participation Process (PPP). Notice is given for the Environmental Authorisation (EA) application to be submitted to the KwaZulu-Natal Department of Economic Development, Tourism and Environmental Affairs (DEDTEA) in terms of the EIA Regulations under Section 24(5), and 44 of the National Environmental Management Act (NEMA) (Act No. 107 of 1998), as amended. The listed activities triggered under Government Notice (GN) R327 is Listing notice 1, Activity 51.

Invitation to participate. To register as an Interested and or Affected Party and to obtain further information related to the proposed project, please contact Exigent Engineering Consultants by 12 May 2026.

Exigent Engineering Consultants Suvana Alakram PO Box 9514, Richards Bay, 3900 Tel: (082) 671 6686 E-mail: jacolette@exigent.co.za / suvana@exigent.co.za

Date of notice: 10 April 2026

10-04-2026

SR015454

0915 SALE IN EXECUTION

AUCTION

NOTICE OF SALE

IN THE HIGH COURT OF SOUTH AFRICA KWA-ZULU NATAL LOCAL DIVISION,

DURBAN CASE NO. 2025 - 171936 In the matter between: RESILIENT PROPERTIES (PTY) LIMITED Plaintiff and MANGXUBE (PTY) LIMITED 1st Defendant T/A WIMPY RICHARDS BAY ERIC THUTHUKANI MZIMELA 2nd Defendant

IN pursuance to default judgment obtained in the High Court of Durban on the 23 January 2026, and a warrant of execution issued thereunder, the goods hereunder will be sold in execution by Acting Sheriff Lower Umfolozi to the highest bidder on the 24 April 2026 at 11:00 AM at Unit 99 Alumina Storage, 133 Alumina Allee, Elton, Richards Bay, consisting of:

- Goods:
- 1 x several gray upholstered benches
 - 1 x Wooden and steel chairs variety
 - 1 x cream tables
 - 1 x red upholstered benches
 - 1 x red computer trolley
 - 1 x 2 baby feeding chairs
 - 6 x outside table and bench combos
 - 1 x jungle gym
 - 1 x stainless steel table in kitchen
 - 1 x various crockery, cutlery, and glasswave
 - 1 x Lunna wega barista machine
 - 1 x Hisense microwave
 - 1 x anvil electric waffle maker
 - 1 x coffee queen urn
 - 1 x stainless steel counter with 7 shelves + 1 drawer
 - 3 x stainless steel counter fridges
 - 1 x milkshake mixer
 - 1 x stainless steel electric grill station
 - 1 x egg frier and egg bath /frier
 - 1 x stainless chip warmer
 - 1 x chest freezer white
 - 1 x microwave oven
 - 1 x stainless steel toaster
 - 1 x bun toaster
 - 1 x stainless steel dishwasher
 - 1 x various small kitchen items and condiments baskets
 - 1 x entrance shelf for menus etc.
 - 1 x gas grill
 - 1 x soft serve machine
 - 1 x stainless steel chip frier

Take further notice that: 1. This sale in execution is conducted in accordance to the Consumer Protection Act 68 of 2008 as amended, in pursuant of an order granted against the defendant for money owing to the plaintiff. 2. The auction will be conducted by the Sheriff, G S NDLOVU, or his deputy. 3. Advertising costs at current publication rates and sales costs according to court rules apply. 4. Registration as a buyer is a pre-requisite subject to conditions, inter alia: 5. Directive of the Consumer Protection Act 68 of 2008; (url http://www.info.gov.za/view/downloadfileaction?id=99961). 6. Rules of the auction and conditions of sale may be inspected at the Sheriff's Office (37 Union Street, Empangeni) 24 hour prior to the auction. 7. All bidders are required to present their identification document together with their proof of residence for FICA compliance. 7. All bidders are required to pay R1,000.00 (refundable) registration fee prior to the commencement of the auction in order to obtain a buyer's card. 8. The sale will be strictly for cash or EFT. 9. Original proof of residence, copy of ID + deposit of R1,000.00 in cash. 10. Prospective buyers can register at the Sheriff's Office storeroom, UNIT 99 ALUMINA STORAGE, 133 ALUMINA ALLEE, ALTON, RICHARDS BAY from 8am in the morning. No unregistered buyers will be allowed to participate in the sale of execution.

DATED at UMHLANGA on this the 24th day of MARCH 2026.

KRITZINGER ELLISH

ATTORNEYS Attorneys for Plaintiffs S u i t e 5 , 2 n d F l o o r 72 Richefond Circle Umhlanga Tel: 031 301 4477 E-mail: ashleigh@keinc.co.za Ref: A Goss/RES2/0053

1 0 - 0 4 - 2 0 2 6

SR015471

AUCTION

NOTICE OF SALE

(THE SALE SHALL BE SUBJECT TO THE TERMS AND CONDITIONS OF THE MAGISTRATE'S COURT ACT NO 32 OF 1944 AND THE CONSUMER PROTECTION ACT NO 68 OF 2008 AND THE RULES PROMULGATED THEREUNDER)

IN THE REGIONAL COURT FOR THE REGIONAL DIVISION OF KWAZULU-NATAL HELD AT PONGOLA CASE NO: KZN/PON /RC05/2021 In the matter between:- NEDBANK LIMITED Plaintiff and ISARIAH JABULANI MBATHA First Defendant NOKUTHULA THULI MBATHA Second Defendant

The property which will be put up for auction on THURSDAY the 23rd APRIL 2026 at 11H00 at the Sheriff's office, No. 185 Piet Retief Street, Pongola with the reserve price of R150 000.00. DESCRIPTION: ERF 485 NCOTSHANE B, Registration Division HU, Province of

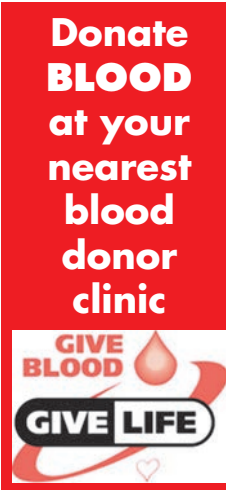
KwaZulu-Natal, in extent 632 (Six Hundred and Thirty Two) square metres; Held by Deed of Grant No.TG9796/1987KZ. SITUATE AT: 485 Ncotshane Township B, Pongola. (in the magisterial district of Pongola) The following information is furnished but not guaranteed:- IMPROVEMENTS: A single storey House with concrete block walls and Asbestos roof comprising of:- 4 Bedroom, 1 Lounge, 1 Dining room, 1 Kitchen and 1 Bathroom ZONING: Residential (not guaranteed) The sale shall be subject to the terms and conditions of the Regional Court and the rules made thereunder and the Purchaser (other than the Execution Creditor) shall pay a deposit of 10% of the purchase price in cash at the time of the sale. The full Conditions of Sale and rules of auction shall be inspected at the sheriff's office Pongola at 185 Piet Retief Street, Pongola. (Tel. 072 1298386). Take further notice that:- 1. This sale is a sale in execution pursuant to a judgment obtained in the above court. 2. The Rules of this auction and a full advertisement is available 24 hours before the auction at the sheriff's office Pongola at 185 Piet Retief Street, Pongola. 3. Registration as a buyer is a pre-requisite subject to the conditions, inter alia: (a) Directive of the Consumer Protection Act 68 of 2008 (URL http://www.info.gov.za/view/DownloadFileAction?id=99961)

(b) FICA-legislation in respect of proof of identity and address particulars; (c) Payment of a registration fee of R15,000.00 via EFT (refundable) prior to the commencement of the auction in order to obtain a buyers card; 4. Registration conditions; 5. Advertising costs at current publication rates and sale costs according to court rules apply. The office of the Sheriff for Pongola will conduct the sale with auctioneer Mirinda Galant or his/her deputy. DATED at UMHLANGA this 27th day of MARCH 2026.

Plaintiff's Attorneys, Livingston Leandy Inc, Ground Floor, 4 Pencarrow Crescent, La Lucia Ridge: Ref: 28M21202

10-04-2026

SR015452



• PUBLIC & LEGAL NOTICES •

PUBLIC NOTICE

RICHARDS BAY CLEAN AIR ASSOCIATION

ANNUAL GENERAL MEETING

In accordance with the provisions of Schedule 3, Article 3.2(b) of the Memorandum of Incorporation, Notice is hereby given that the Twenty-Ninth (29th) Annual General Meeting of the Richards Bay Clean Air Association will be held on Friday, 17 April 2026, at 11h00.

For more information kindly contact; Sandy Camminga Communications Officer 083 515 2384

sr015431-15-26©

• PUBLIC & LEGAL NOTICES •

MOLOBEDU MAKOWENI (PTY) LTD

ISAZISO SENQUBO YOKUHLOLA UMTHELELA WEZEMVELO ISIMEMO SOKUBHALISA NJENGEQEMBU ELINESITHAKAZELO NELITHINTILE FUTHI UPHAWULWE NGOMBIKO WOKUHLOLA OKUHLAKATHIWE.

ISAZISO SOKUGUNYAZWA KWEMVELO KWESICELO SELUNGELO LOKUHLOLA AMALAHLE EPLAZINI ILOTI 289 EMPANGENI 13389 GU, NELOTI 285 EMPANGENI 13400 GU, ESISE-KING CETSHWAYO DISTRICT, ESIFUNDAZWENI SAKWA-ZULU NATALE.

INOMBOLO YOKUBHEKISA YE-DMPR: KZN 30/5/1/1/2/ 12129 PR

Isaziso sinikezwa ngenhloso yokuqhuba inqubo yokuGunyazwa Kwezemvelo yokufaka isicelo se-llungelo lokuhlola amalahle leMolobedu Makoweni (Pty) Ltd ngokwemigomo yoMthetho Kazwelonke Wokuphathwa Kwemvelo - NEMA (uMthetho 107 ka-1998) njengoba uchitshiyelwe, kanye neMithethonqubo Yokuhlolwa Komthelela Wezemvelo (i-EIA), ka-2014. Isaziso sinikezwa bonke Abantu Abanentshisekelo Nabathintekayo (ama-I&AP) ngokwemigomo yeSigaba 39 kuya ku-44 se-GNR 982 (njengoba sichitshiyelwe). Inqubo ye-EIA izokwenziwa ngokwemigomo yalezi ziqondiso futhi ithunyelwe kuMnyango Wezokumbiwa Phansi Onekhono Wezinsizakusebenza Zezimbiwa Nephethiloli (i-DMPR).

INDAWO YESIZA ESICATSHAZWAYO.

Indawo yokuhlola itholakala ngamakhilomitha angu-19 eNyakatho yeMpangeni kanye namakhilomitha angu-21 eNtshonalanga yedolobha lakwaMbonambi, kusetshenziswa umgwaqo wokungena we-R34.

UMHLANGANO WOMPHAKATHI:

Kuzoba nomhlango womphakathi ukuze kuqhutshwe izingxoxo ngoMbiko Wokuhlola Owuhlaka ukuze kutholakale imibono kanye nemibono evela kumaqembu anentshisekelo nathintekayo (ama-I&AP), ngakho-ke niyacelwa ukuthi nibhalise amagama enu njenge-I&AP zingakapheli izinsuku eziyi-15, ngaleyo ndlela, ngaphambi/ngaphambi kuka-Ephreli 24, 2026.Uyacelwa futhi ukuthi uthumele imibono yakho zingakapheli izinsuku ezingama-30 kusukela ngosuku lesi saziso esashicilelwa ngalo. Qaphela ukuthi imibono yakho kumele ithunyelwe ngaphambi noma ngaphambi-11 Meyi, 2026 imininingwane engezansi:

Umeluleki : Vahlengwe Mining Advisory and Consulting Umuntu othintwayo : Sunday Mabaso Ikheli leposi : 238 Voster Ave, Glenvista Extension 3, Johannesburg South, 2058 Xhumana : +27 11 432 0062/ 0745697312 I-imeyili : info@vahlengweadvisory.co.za

sr015470-15-26©

ANNEXURE D NOTICE TO DISPLAY INTENTION TO APPLY FOR LIQUOR LICENCE IN TERMS OF SECTION (42)(1)(b)(iii) OF ACT KwaZulu-Natal Liquor Licensing Act, 2010 (Act No. 6 of 2010) KZNLA 3	
Name and surname of the applicant:	PHAKAMANI JAMES KHUMALO
Category of licence applied for: (on-/off-consumption/micro-manufacturer/special event):	OFF-CONSUMPTION
Type of premises for which licence is applied for: (type of licence)	LIQUOR STORE
Trading name of the premises:	VELABUSHA LIQUOR STORE
Address of the premises:	PO BOX 681 KWAMBONAMBI 3915
Date of display:	10 APRIL 2026
Expiry date of display:	12 MAY 2026

NB: Objections should be lodged with the local committee at King Cetshwayo District office from where the application emanates within 21 (working) days from the date of the display. For more enquiries you can contact Mr Ntobeko Zulu at Ntobeko.zulu@kznlqa.co.za

sr015455-15-26©

MOLOBEDU MAKOWENI (PTY) LTD

NOTICE OF ENVIRONMENTAL IMPACT ASSESSMENT PROCESS INVITATION TO REGISTER AS AN INTERESTED AND AFFECTED PARTY AND COMMENT ON THE DRAFT SCOPING REPORT.

NOTICE OF ENVIRONMENTAL AUTHORISATION FOR THE PROSPECTING RIGHT APPLICATION FOR COAL ON FARM LOT 289 EMPANGENI 13389 GU, AND LOT 285 EMPANGENI 13400 GU, SITUATED IN KING CETSHWAYO DISTRICT, KWA-ZULU NATAL PROVINCE.

DMPR REFERENCE NO: KZN 30/5/1/1/2/ 12129 PR

Notice is hereby given in the intent to conduct Environmental Authorization process for an application of a prospecting right for coal for Molobedu Makoweni (Pty) Ltd in terms of National Environmental Management Act - NEMA (Act 107 of 1998) as amended, and the Environmental Impact Assessment (EIA) Regulations, 2014. Notification is hereby given to all Interested and Affected Parties (I&APs) in terms of Section 39 to 44 of GNR 982 (as amended). The EIA process would be undertaken in terms of these guidelines and to be submitted to the Competent Authority Department of Mineral and Petroleum Resources (DMPR).

PROPOSED SITE LOCATION

The prospecting area is situated 19 km North of Empangeni and 21 km West of KwaMbonambi town, using R34 access road.

PUBLIC MEETING:

Public meeting will be held to facilitate discussions on the Draft Scoping Report to obtain comments and inputs from the Interested and Affected Parties (I&APs), therefore you are requested to register your names as I&AP within 15 days, thus, on/before **24th of April 2026**. You are further requested to submit your comments within 30 days from the date this notice was published. Take note that your comments must be submitted on or before the **11th of May 2026** to the details below:

Consultant : Vahlengwe Mining Advisory and Consulting
Contact person : Sunday Mabaso
Postal address : 238 Voster Ave, Glenvista Extension 3, Johannesburg South, 2058
Contact : +27 11 432 0062/ 0745697312
E-mail : info@vahlengweadvisory.co.za

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MOLOBEDU MAKOWENI (PTY) LTD

INVITATION TO REGISTER AS AN INTERESTED AND AFFECTED PARTY AND COMMENT ON THE DRAFT BASIC ASSESSMENT REPORT (DBAR).

NOTICE OF PUBLIC PARTICIPATION FOR PROSPECTING RIGHT FOR COAL, IN RESPECT OF THE FARMS LOT 278 EMPANGENI 14015 GU, LOT 254 EMPANGENI 14014 GU, AND PORTION 4 & RE OF LOT 272 EMPANGENI 12922 GU, SITUATED IN KING CETSHWAYO DISTRICT MUNICIPALITY, KWAZULU-NATAL PROVINCE.

DMPR REFERENCE NO.: KZN 30/5/1/1/2 12120 PR

Notice is hereby given of the intent to conduct an environmental authorization process for an application of a prospecting right of coal for Molobedu Makoweni (Pty) Ltd in terms of the National Environmental Management Act - NEMA (Act 107 of 1998) as amended, and the Environmental Impact Assessment (EIA) Regulations, 2014.

THE ABOVE ACTIVITIES TRIGGERED:

• GN R 983 (Listing Notice No. 1 (as amended)): Activity 20 Any activity including the operation of that activity which requires a prospecting right in terms of section 16 of the Mineral and Petroleum Resources Development Act, as well as any other applicable activity as contained in this Listing Notice or in Listing Notice 3 of 2014, required to exercise the prospecting right.

SITE LOCATION

The prospecting right is located in respect of LOT 278 Empangeni 14015 GU, LOT 254 Empangeni 14014 GU, and Portion 4 & RE OF LOT 272 Empangeni 12922 GU, located within the King Cetshwayo District and uMhlathuze Local Municipalities, KwaZulu-Natal (KZN) Province.

PUBLIC MEETING:

A public meeting will be held to facilitate discussions on the Draft EIA and EMPr to obtain comments and inputs from the Interested and Affected Parties (I&APs); therefore, you are requested to register your names as I&APs within 15 days, thus, on/before **April 24, 2026**. You are further requested to submit your comments within 30 days from the date this notice was published. Take note that your comments must be submitted on or before **May 11, 2026**, to the details below:

Consultant : Vahlengwe Mining Advisory and Consulting
Contact person : Sunday Mabaso
Postal address : 238 Voster Ave, Glenvista Extension 3, Johannesburg South, 2058
Contact : +27 11 432 0062/ 0745697312
E-mail : info@vahlengweadvisory.co.za

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Appendix 3B:

Background Information Document & I&AP registration form

BACKGROUND INFORMATION DOCUMENT

ENVIRONMENTAL AUTHORISATION FOR THE PROSPECTING RIGHT APPLICATION OF COAL ON THE FARM LOT 289 EMPANGENI 13389 GU, LOT 285 EMPANGENI 13400 GU, SITUATED IN KING CETSHWAYO DISTRICT, KWA-ZULU NATAL PROVINCE.

DMPR REFERENCE NO: KZN 30/5/1/1/2/ 12129 PR

PURPOSE OF THIS DOCUMENT

This Background Information Document (BID) has been prepared as part of the notification and consultation process required in terms of the National Environmental Management Act (NEMA) (Act 107 of 1998). It describes the following:

- Background information regarding the proposed project.
- Information about the site and the proposal being considered.
- Public participation process; and
- Suggestions on how the stakeholders including the I&APs can participate on the process.

APPOINTED ENVIRONMENTAL ASSESSMENT PRACTITIONERS.

Vahlengwe Mining Advisory and Consulting as an Environmental Assessment Practitioner (EAP) will conduct Environmental Authorization process for the prospecting right application for coal prospecting activities in respect of the farm lot 289 Empangeni 13389 GU, lot 285 Empangeni 13400 GU, situated in King Cetshwayo district, Kwa-Zulu Natal Province.

PROJECT PROPERTY AND LOCATION.

The proposed project is situated 19 km North-West of Empangeni and 21 km West of KwaMbonambi town, using R34 access road.

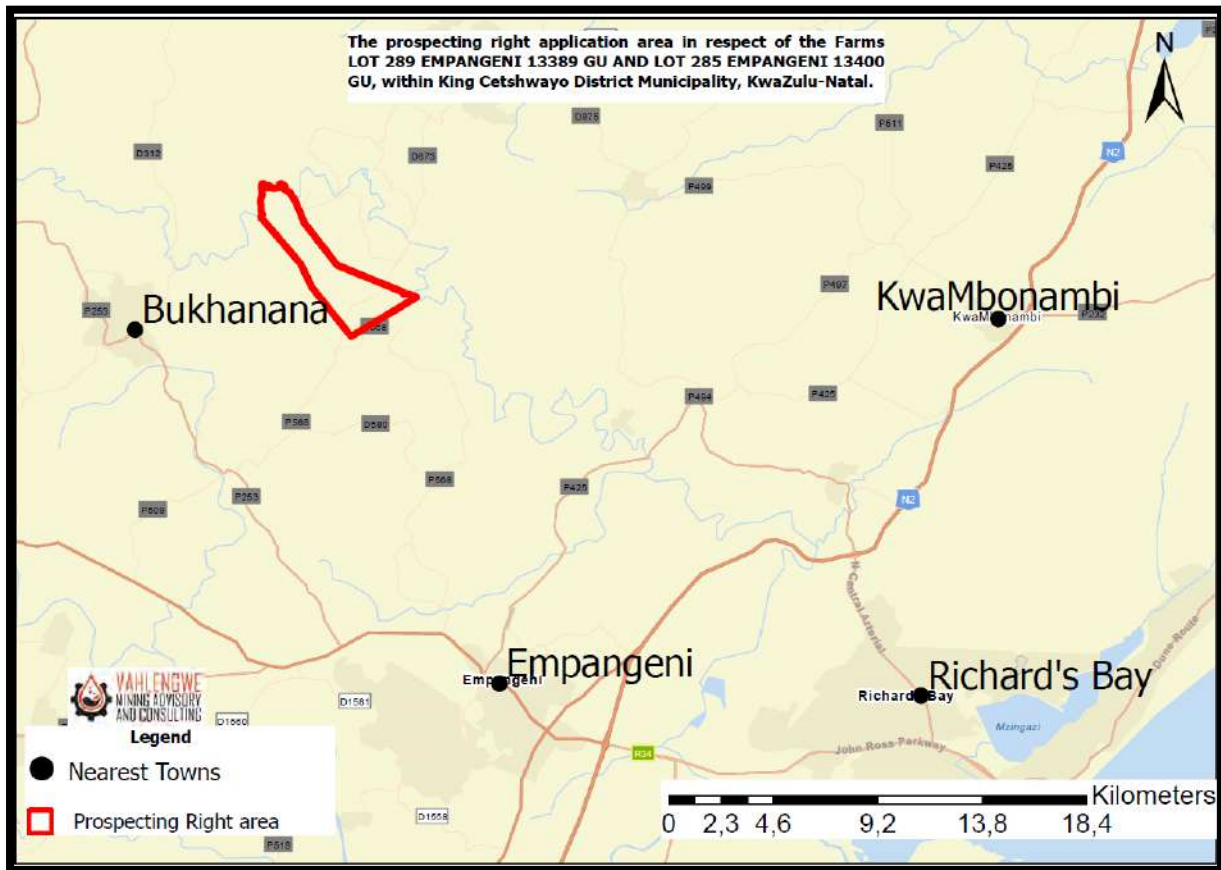


Figure 1: Locality Map

PUBLIC PARTICIPATION PROCESS.

The purpose of public consultation process is to enable landowners, lawful occupiers, directly affected individuals, and/or other Interested and Affected Parties (I&APs) to raise any issues, concerns and or comments regarding the prospecting activities. A proof of consultation report will be developed and submitted to the Department of Mineral and Petroleum Resources (DMPR). The proposed project requires Environmental Impact Assessment process in terms of the National Environmental Management Act, 1998 (Act 107 of 1998) (as amended).

Following step will be followed while conducting public participation.

- Issuing of notification of this project to:
 - Owners and occupiers of the farms as well as those adjacent to the site
 - Municipal Councillor
 - The municipality which has jurisdiction, and any organ of state having jurisdiction

- Placing an advert in a local newspaper
- Placing a notice on the site notice
- Meetings with landowners and key I&APs, as required
- Public review of Basic Assessment Report and Environmental Management Programme

PUBLIC INVOLVEMENT

Public involvement is an essential component of the process. It addresses the right of Interested and affected Parties (I&APs) to be informed of the proposed activities.

All Interested and Affected parties (I&APs) are invited to submit their issues, concerns, and comments regarding the proposed prospecting activities to Molobedu Makoweni via email, registered post or telephonically. The Interested and Affected parties (I&APS) Form is made available below for you to fill in your personal details and comments, kindly do so and submit it back to us.

HOW TO OBTAIN FURTHER INFORMATION.

Registering as I&APs will ensure that you are placed on a database to be informed of any progress regarding the project. You can do so by filling in the form below and return it to the relevant person listed below.

We encourage the I&APs to review the information presented to you in this Background Information Document (BID) and to register as an I&AP for the attached respondent sheet and return it to us.

PUBLIC CONSULTATION CONTACTS:

Name: : Sunday Mabaso
Postal address : 238 Voster Ave, Glenvista Ext 3, Glenvista, 2190
Contact : +27 11 432 0062 / +27 74 569 7312
E-mail : info@vahlengweadvisory.co.za

APPLICANT CONTACTS

Name : Niel Van Zyl
Postal Address : Plot 1 AH, Sapfo Valtaki, Gauteng 1020
Tel : +27 82 461 3787
E-mail : neil@exicon.co.za / vanzylp@gmail.com

Molobedu Makoweni (Pty) Ltd
Interested & Affected Party Registration Form

Project Reference No.: KZN 30/5/1/1/2/12129 PR

Name and surname	
Physical Address	
Contact Details	Telephone No.: Fax No.: Cell No.: E-mail Address:
<i>Please indicate any issues, comments and concerns with regard to the proposed project</i>	
<i>Please indicate in which aspects you would require more information</i>	
<i>Please indicate any I&APs whom you think should be contacted</i>	
To be registered as an I&AP for this project mail, or e-mail the completed registration form to: Sunday M Mabaso Postal address: 238 Voster Ave, Glenvista Ext 3, Glenvista, 2190 Contact : +27 11 432 0062/ +27 74 569 7312 E-mail : info@vahlengweadvisory.co.za	

Appendix 4:

Environmental Sensitivity Screening Report

**SCREENING REPORT FOR AN ENVIRONMENTAL AUTHORIZATION AS
REQUIRED BY THE 2014 EIA REGULATIONS – PROPOSED SITE
ENVIRONMENTAL SENSITIVITY**

EIA Reference number: KZN 30/5/1/1/2(12129) PR

Project name: Prospecting Right

Project title: Prospecting Right

Date screening report generated: 15/12/2025 13:23:20

Applicant: Molobedu Makoweni (Pty) Ltd

Compiler: Vahlengwe Mining Advisory and Consulting

Compiler signature: *khanyile*
.....

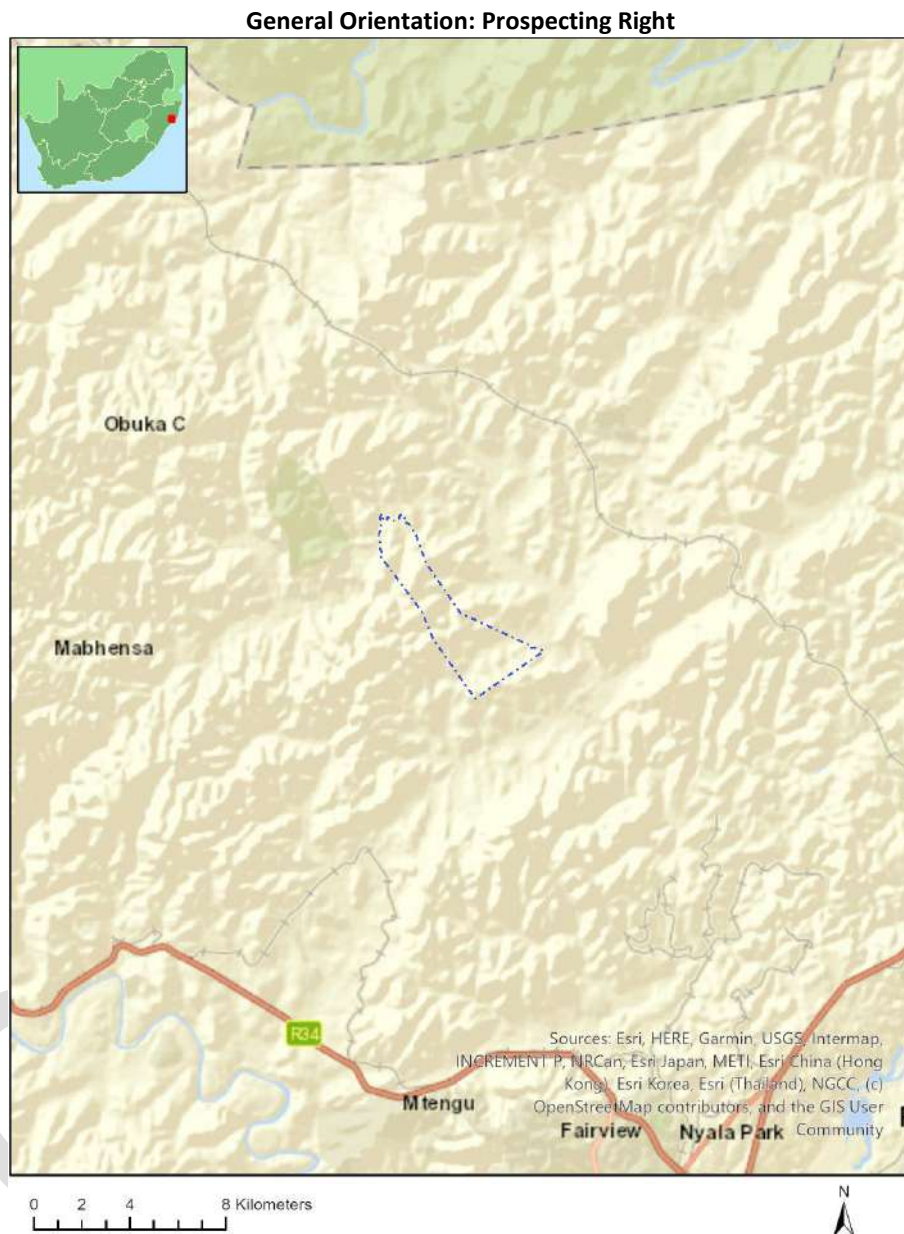
Application Category: Mining|Prospecting rights

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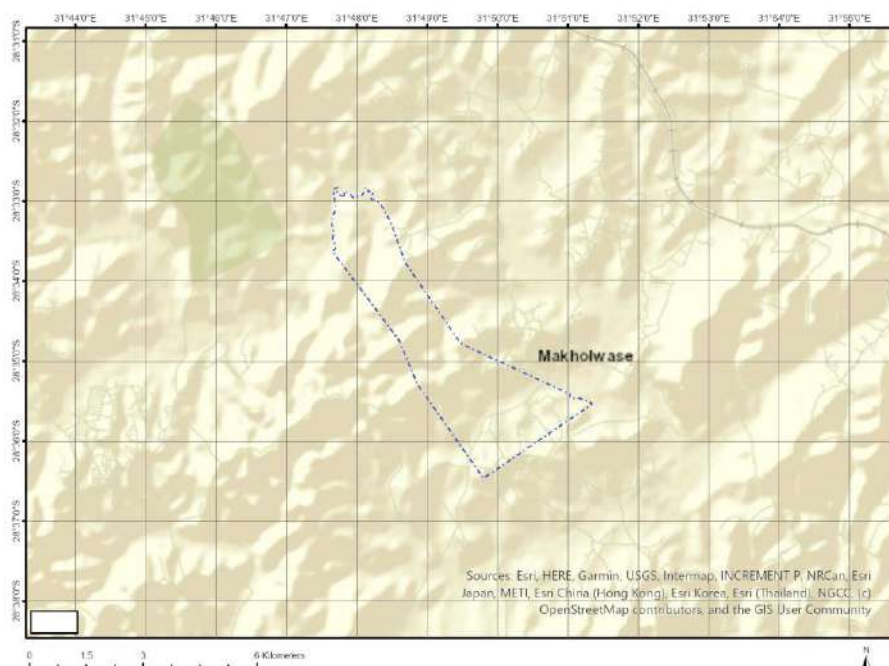
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Wind and Solar developments with an approved Environmental Authorisation or applications under consideration within 30 km of the proposed area	4
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Environmental screening results and assessment outcomes	5
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Proposed Project Location

Orientation map 1: General location



Map of proposed site and relevant area(s)



Cadastral details of the proposed site

Property details:

No	Farm Name	Farm/ Erf No	Portion	Latitude	Longitude	Property Type
1		13389	0	28°35'28.95S	31°49'56.68E	Farm
2		13400	0	28°33'55.49S	31°48'23.79E	Farm
3	LOT 285 EMPANGENI	13400	0	28°33'56.89S	31°48'23.54E	Farm Portion
4	LOT 289 EMPANGENI	13389	0	28°35'30.08S	31°49'56.69E	Farm Portion

Development footprint¹ vertices:

No development footprint(s) specified.

Wind and Solar developments with an approved Environmental Authorisation or applications under consideration within 30 km of the proposed area

No	EIA Reference No	Classification	Status of application	Distance from proposed area (km)
1	12/12/20/2387	Wind	Approved	9.3

¹ "development footprint", means the area within the site on which the development will take place and includes all ancillary developments for example roads, power lines, boundary walls, paving etc. which require vegetation clearance or which will be disturbed and for which the application has been submitted.

2	12/12/20/2387/AM1	Wind	Approved	9.3
3	14/12/16/3/3/2/2041	Solar PV	Approved	26.2
4	14/12/16/3/3/1/462	Solar PV	Approved	29.3
5	14/12/16/3/3/2/867	Solar PV	Approved	26.5

Environmental Management Frameworks relevant to the application

No intersections with EMF areas found.

Environmental screening results and assessment outcomes

The following sections contain a summary of any development incentives, restrictions, exclusions or prohibitions that apply to the proposed development site as well as the most environmental sensitive features on the site based on the site sensitivity screening results for the application classification that was selected. The application classification selected for this report is:

Mining | Prospecting rights.

Relevant development incentives, restrictions, exclusions or prohibitions

The following development incentives, restrictions, exclusions or prohibitions and their implications that apply to this site are indicated below.

Incentive, restriction or prohibition	Implication
Strategic Transmission Corridor-Expanded Eastern Corridor	https://screening.environment.gov.za/ScreeningDownloads/DevelopmentZones/Combined_EGI.pdf
Strategic Gas Pipeline Corridors-Phase 7: Coega to Richards Bay	https://screening.environment.gov.za/ScreeningDownloads/DevelopmentZones/Combined_GAS.pdf

Proposed Development Area Environmental Sensitivity

The following summary of the development site environmental sensitivities is identified. Only the highest environmental sensitivity is indicated. The footprint environmental sensitivities for the proposed development footprint as identified, are indicative only and must be verified on site by a suitably qualified person before the specialist assessments identified below can be confirmed.

Theme	Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
Agriculture Theme	X			
Animal Species Theme		X		
Aquatic Biodiversity Theme	X			
Archaeological and Cultural Heritage Theme				X
Civil Aviation Theme		X		
Defence Theme				X
Paleontology Theme	X			
Plant Species Theme			X	
Terrestrial Biodiversity Theme	X			

Specialist assessments identified

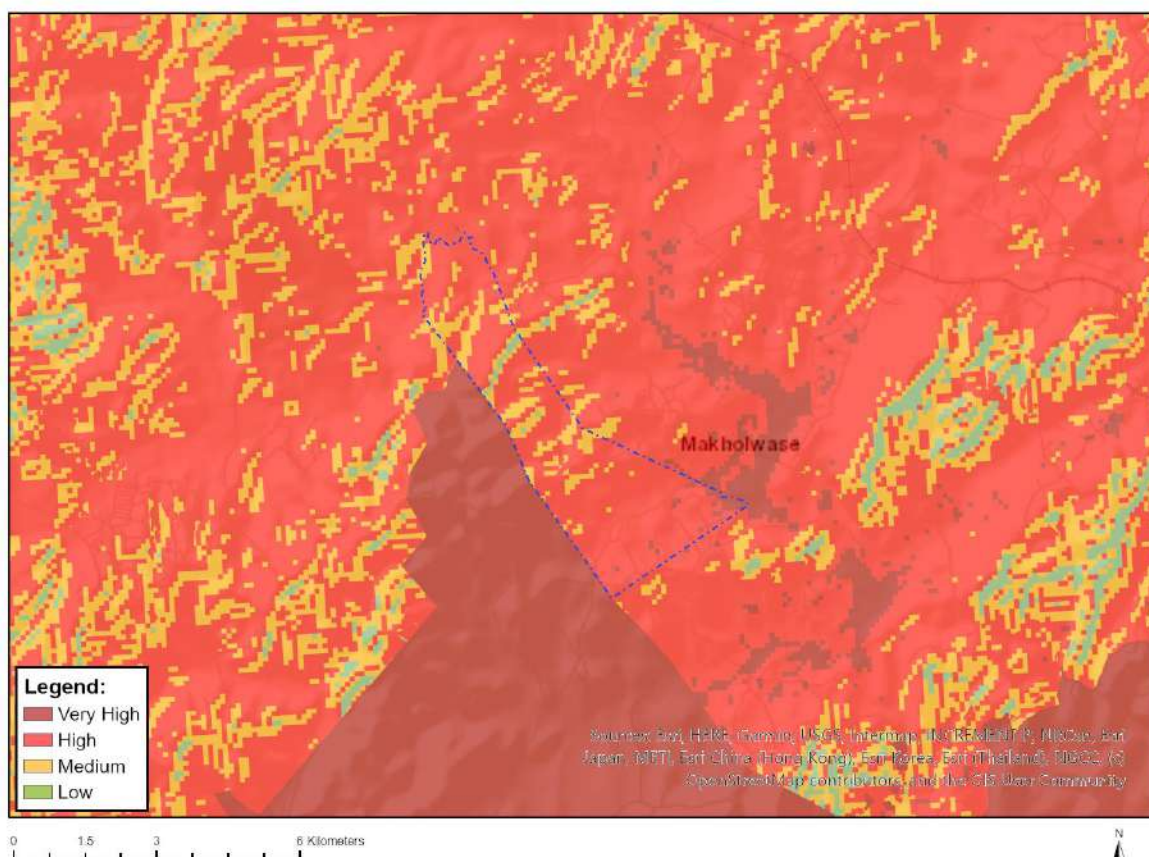
Based on the selected classification, and the known impacts associated with the proposed development, the following list of specialist assessments have been identified for inclusion in the assessment report. It is the responsibility of the EAP to confirm this list and to motivate in the assessment report, the reason for not including any of the identified specialist study including the provision of photographic evidence of the site situation.

No	Specialist assessment	Assessment Protocol
1	Agricultural Impact Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/Gazetted General Agriculture Assessment Protocols.pdf
2	Archaeological and Cultural Heritage Impact Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/GuidanceforHIA.pdf
3	Palaeontology Impact Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/GuidanceforPIA.pdf
4	Terrestrial Biodiversity Impact Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/Gazetted Terrestrial Biodiversity Assessment Protocols.pdf
5	Aquatic Biodiversity Impact Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/Gazetted Aquatic Biodiversity Assessment Protocols.pdf
6	Noise Impact Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/Gazetted Noise Impacts Assessment Protocol.pdf
7	Radioactivity Impact Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/Gazetted General Requirement Assessment Protocols.pdf
8	Plant Species Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/Gazetted Plant Species Assessment Protocols.pdf
9	Animal Species Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/Gazetted Animal Species Assessment Protocols.pdf

Results of the environmental sensitivity of the proposed area.

The following section represents the results of the screening for environmental sensitivity of the proposed site for relevant environmental themes associated with the project classification. It is the duty of the EAP to ensure that the environmental themes provided by the screening tool are comprehensive and complete for the project. Refer to the disclaimer.

MAP OF RELATIVE AGRICULTURE THEME SENSITIVITY

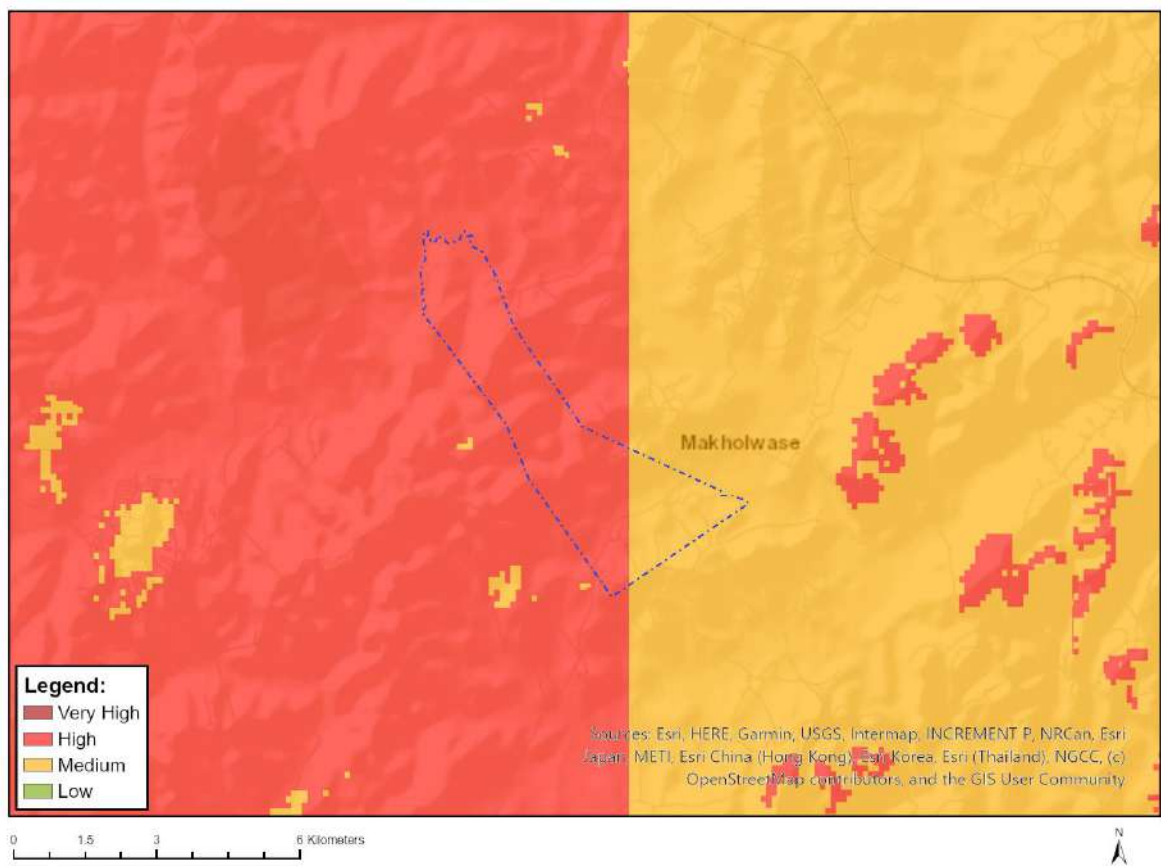


Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
X			

Sensitivity Features:

Sensitivity	Feature(s)
High	Subsistence_Farming_1
High	09. Moderate-High
High	08. Moderate
High	10. Moderate-High
Low	05. Low
Medium	07. Low-Moderate
Medium	06. Low-Moderate
Very High	Empangeni PAA
Very High	11. High

MAP OF RELATIVE ANIMAL SPECIES THEME SENSITIVITY



Where only a sensitive plant unique number or sensitive animal unique number is provided in the screening report and an assessment is required, the environmental assessment practitioner (EAP) or specialist is required to email SANBI at eiadatarequests@sanbi.org.za listing all sensitive species with their unique identifiers for which information is required. The name has been withheld as the species may be prone to illegal harvesting and must be protected. SANBI will release the actual species name after the details of the EAP or specialist have been documented.

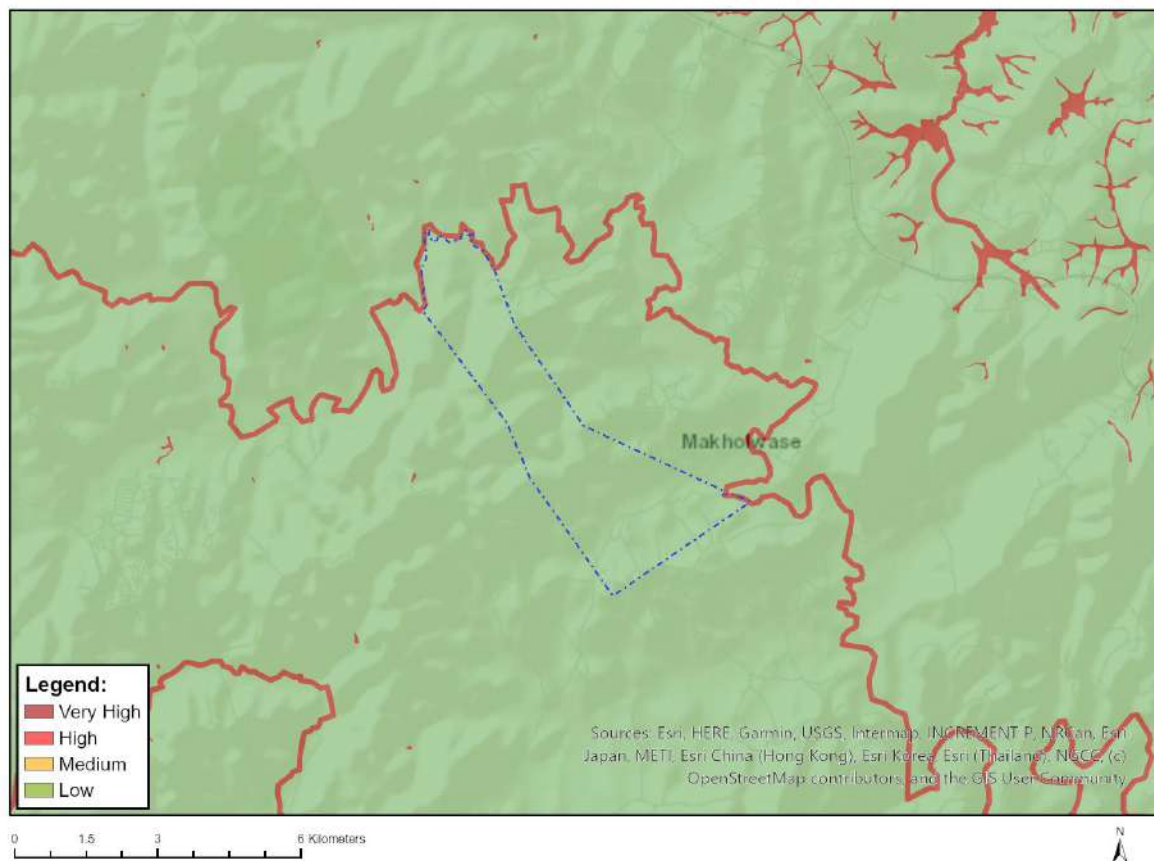
Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
	X		

Sensitivity Features:

Sensitivity	Feature(s)
High	Aves-Terathopius ecaudatus
High	Aves-Aquila rapax
High	Aves-Circus ranivorus
High	Aves-Torgos tracheliotos
High	Aves-Polemaetus bellicosus
High	Aves-Bucorvus leadbeateri
High	Aves-Gyps africanus
High	Aves-Stephanoaetus coronatus
Medium	Aves-Circus ranivorus
Medium	Aves-Terathopius ecaudatus
Medium	Aves-Aquila rapax
Medium	Aves-Gyps africanus
Medium	Aves-Stephanoaetus coronatus

Medium	Insecta-Deloneura millari millari
Medium	Insecta-Iolaus diametra natalica
Medium	Sensitive species 5
Medium	Mammalia-Lycaon pictus
Medium	Sensitive species 8
Medium	Reptilia-Crocodylus niloticus
Medium	Reptilia-Kinixys natalensis
Medium	Invertebrate-Arytropteris basalis
Medium	Invertebrate-Pomatonota dregii

MAP OF RELATIVE AQUATIC BIODIVERSITY THEME SENSITIVITY



Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
X			

Sensitivity Features:

Sensitivity	Feature(s)
Low	Low Sensitivity
Very High	Rivers

MAP OF RELATIVE ARCHAEOLOGICAL AND CULTURAL HERITAGE THEME SENSITIVITY

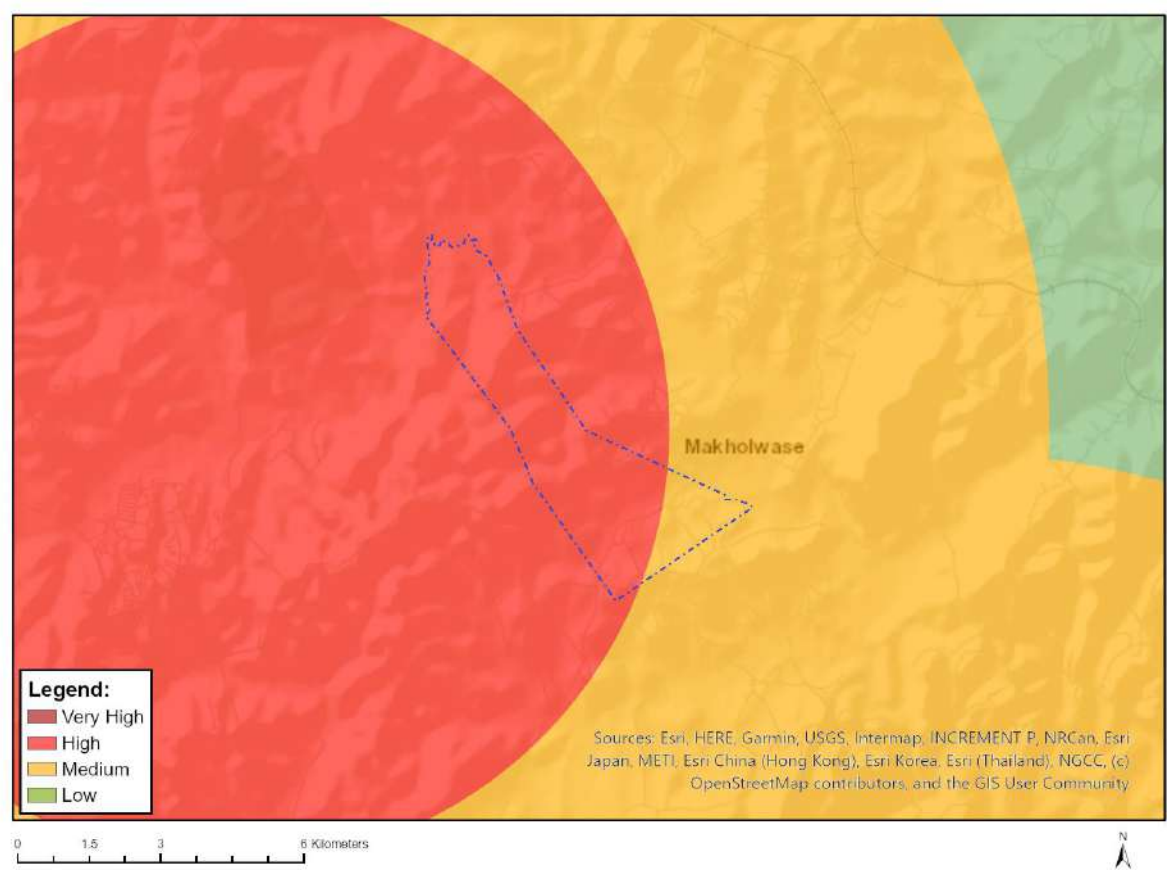


Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
			X

Sensitivity Features:

Sensitivity	Feature(s)
Low	Low Sensitivity

MAP OF RELATIVE CIVIL AVIATION THEME SENSITIVITY



Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
	X		

Sensitivity Features:

Sensitivity	Feature(s)
High	Within 8 km of other civil aviation aerodrome
Medium	Between 8 and 15 km of other civil aviation aerodrome

MAP OF RELATIVE DEFENCE THEME SENSITIVITY



Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
			X

Sensitivity Features:

Sensitivity	Feature(s)
Low	Low Sensitivity

MAP OF RELATIVE PALEONTOLOGY THEME SENSITIVITY



Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
X			

Sensitivity Features:

Sensitivity	Feature(s)
High	Features with a High paleontological sensitivity
Very High	Features with a Very High paleontological sensitivity

MAP OF RELATIVE PLANT SPECIES THEME SENSITIVITY



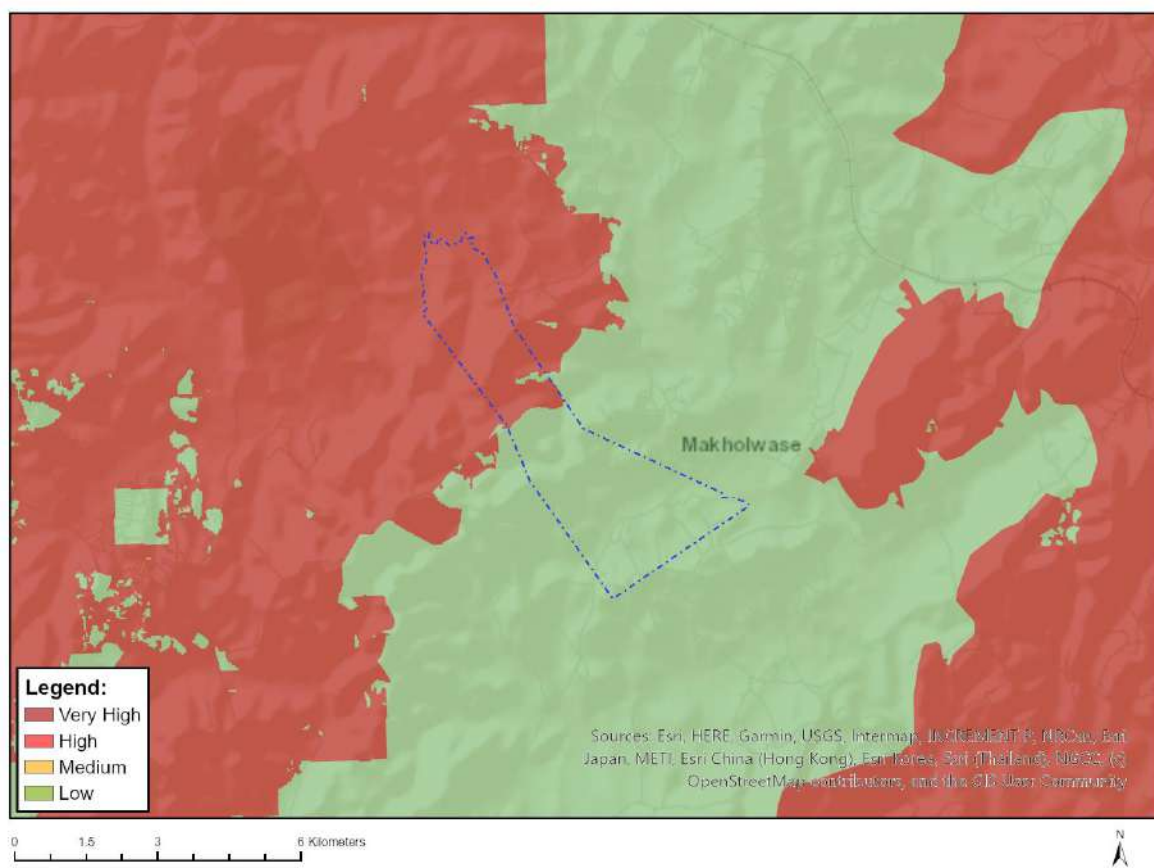
Where only a sensitive plant unique number or sensitive animal unique number is provided in the screening report and an assessment is required, the environmental assessment practitioner (EAP) or specialist is required to email SANBI at eiadatarequests@sanbi.org.za listing all sensitive species with their unique identifiers for which information is required. The name has been withheld as the species may be prone to illegal harvesting and must be protected. SANBI will release the actual species name after the details of the EAP or specialist have been documented.

Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
		X	

Sensitivity Features:

Sensitivity	Feature(s)
Low	Low Sensitivity
Medium	Salpinctium natalense
Medium	Sensitive species 1076
Medium	Oxygonum dregeanum subsp. streyi
Medium	Sensitive species 191

MAP OF RELATIVE TERRESTRIAL BIODIVERSITY THEME SENSITIVITY



Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
X			

Sensitivity Features:

Sensitivity	Feature(s)
Low	Low Sensitivity
Very High	CBA 1
Very High	ESA: Species
Very High	National Protected Area Expansion Strategy (NPAES)

Appendix 5:

Specialist Studies



Fundor Enviro Services

THE ENVIRONMENT IS OUR BUSINESS

Report Title:

**BIODIVERSITY ASSESSMENT FOR A PROSPECTING
RIGHT ON FARM LOT 289/285 EMPANGENI, UMHLATHUZE
LOCAL MUNICIPALITY, KWAZULU-NATAL**

DMRE Reference:

KZN 30/5/1/1/2/ 12129 PR

Date:

MARCH 2026

Prepared for:

Molobedu Makoweni (Pty) Ltd

PROJECT TITLE: BIODIVERSITY ASSESSMENT FOR A PROSPECTING RIGHT ON FARM LOT 289/285 EMPANGENI, UMHLATHUZE LOCAL MUNICIPALITY, KWAZULU-NATAL			
Date		March 2026	
Report Version		Final	
Report Reference			
GPS Location			
Closest Town		Empangeni, KZN	
DMRE Reference		KZN 30/5/1/1/2/ 12129 PR	
Verification	Name	Signature	Date
Author 1	Nkululeko Zondi Pr. Sci. Nat 122246 (MSc)		

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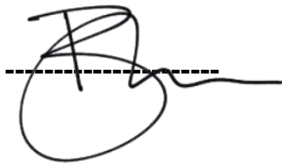
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DECLARATION OF CONSULTANTS' INDEPENDENCE

- Fundor Enviro Services (PTY) Ltd is an independent consultant and hereby declares that;
 - It acted as the independent specialist in this application,
 - it does not have any financial or other vested interest in the undertaking of the proposed activity,
 - have disclosed, to the applicant, EAP and competent authority, any material information that have or may have the potential to influence the decision of the competent authority or the objectivity of any report, plan or document required in terms of the NEMA, the Environmental Impact Assessment Regulation, 2010 and any specific environmental management Act;
 - have provided the competent authority with access to all information at its disposal regarding the application, whether such information is favourable to the applicant or not; and
 - ZN Geo Services (PTY) Ltd is aware that a false declaration is an offence in terms of regulation 48 of GN No. R. 982

A handwritten signature in black ink, consisting of a large, stylized 'Z' or 'G' shape with a horizontal line extending to the right, positioned above a dashed horizontal line.

26/02/2026

Date

EXECUTIVE SUMMARY

The proposed coal prospecting activity is located within the Zululand Lowveld and Northern Zululand Sourveld ecosystems, both of which are classified as Vulnerable, with the site exhibiting stronger ecological characteristics of the former. This context highlights a high level of ecological sensitivity, requiring careful planning and the implementation of stringent mitigation measures to minimise potential environmental impacts.

The site's designation as a Key Biodiversity Area (KBA), together with its classification as a Critical Biodiversity Area (CBA) and inclusion within a National Protected Area Expansion Strategy (NPAES) Priority Focus Area, confirms its significant conservation importance. These overlapping designations indicate that the area supports important biodiversity features and ecological processes that warrant a precautionary and highly controlled approach to development. Accordingly, the project must demonstrate strict adherence to the mitigation hierarchy, prioritising avoidance, followed by minimisation and rehabilitation, with the objective of achieving no net loss of biodiversity.

The proposed prospecting activity is limited in scale, comprising approximately 10 core drilling points with a combined footprint of approximately 0.012 hectares. Despite this relatively small physical footprint, the fact that the entire prospecting right area falls within a KBA elevates the ecological risk and necessitates a conservative approach to site selection and implementation.

While prospecting is generally less invasive than full-scale mining, it remains inappropriate in intact and undisturbed areas, particularly those located far from existing access routes. These ecosystems are characterised by their threatened status, ecological importance, and low resilience to disturbance. Any loss or modification of intact habitat could result in irreversible biodiversity impacts. It is therefore recommended that all prospecting activities be confined to areas adjacent to existing roads and that clearing of woody vegetation be strictly avoided.

Prior to mitigation, the ecological impact of the proposed activity is assessed as medium to high significance, primarily due to its location within sensitive and threatened ecosystem types. With the implementation of robust mitigation measures—including minimisation of the disturbance footprint, avoidance of intact habitats, control of alien invasive species, strict spill prevention protocols, and effective rehabilitation of disturbed areas—the impact significance can potentially be reduced to low to medium. Nonetheless, a degree of residual ecological risk remains, given the conservation status and sensitivity of the affected ecosystems.

1. INTRODUCTION

Molobedu Makoweni (Pty) Ltd has submitted an application for a Prospecting Right in terms of the Mineral and Petroleum Resources Development Act (Act No. 28 of 2002) (MPRDA) and associated Environmental Authorisation in terms of the National Environmental Management Act (Act No. 107 of 1998) (NEMA), as read with the 2014 Environmental Impact Assessment (EIA) Regulations (as amended). The proposed prospecting activity is located on Farm Lot 289/285 Empangeni, located approximately 32 kilometres North-West of Empangeni, KwaZulu-Natal Province. The area applied for under the ambit of this prospecting right application is approximately 1 166.63 hectares in extent.

In support of the Basic Assessment process, a biodiversity specialist study was commissioned to assess the potential impacts of the proposed prospecting activities on ecological features, habitats, and species of conservation concern. This report provides a baseline ecological assessment of the proposed development footprint and surrounding environment, identifies biodiversity sensitivities, and evaluates the significance of potential impacts, with recommendations for mitigation and management.

2. SCOPE OF WORK

The primary objective of this assessment is to evaluate the biodiversity and ecological sensitivity of the prospecting right application area, and to provide specialist input to inform the Basic Assessment Report (BAR) required for environmental authorisation. The scope of work covers both desktop analysis and a preliminary field-based verification of ecological features.

2.1 Scope of Work for Terrestrial Vegetation and Animal Assessment

For terrestrial plant assessment, this study will do the following:

- Supply background information on the site relating to conservation plans, protected areas and threatened ecosystems on or in proximity to the site;
- Describing and mapping the vegetation communities or groups found on the site and their conservation importance and function within the landscape;
- Discussion of plants of conservation concern that could be present on the site, as well as those confirmed to occur during the field survey;
- Map indicating confirmed or potential habitat for plant species that are of conservation concern, as well as ecologically sensitive vegetation groupings; and
- Assessment and report on the impacts of the proposed development on the vegetation on site, as well as mitigation measures to limit or negate these perceived impacts.

For terrestrial animal assessment, this study will do the following:

- To qualitatively and quantitatively assess the significance of the vertebrates' and invertebrates' habitat components and the current general conservation status of the property;
- To identify and comment on ecologically sensitive areas;
- To comment on connectivity with natural vegetation and habitats on adjacent sites;
- To provide lists of vertebrates that occur or might occur, and to identify species of conservation importance;
- To highlight the potential impacts of the proposed development on the vertebrates of the study site, and
- To provide management recommendations to mitigate negative and enhance positive impacts should the proposed development be approved.

2.2 Assumptions and limitations

This biodiversity assessment is based on available spatial data and a single site visit. The timing of the field survey falls within the summer season in KwaZulu-Natal, which, at the time of the study, was a hot and wet summer season. The dominant vegetation type in the area is tree cover; therefore, at the time of the site visit, the tree cover was healthy and green.

3. METHODOLOGY

The biodiversity assessment included a literature review and a field survey. The methodology used is provided below.

3.1 Literature review

A vegetation and animal literature search was conducted to document all known occurrences of plant species within the **QDS 2835_3145/2835_3140**.

Knowledge of key conservation areas in the region was shaped by insights from the KwaZulu-Natal Biodiversity Sector Plan, and the 2017 National Protected Areas Expansion Strategy (NPAES; Government of South Africa, 2016).

To comprehensively grasp the larger vegetation patterns in the adjacent landscape, we consulted the 2018 version of the Vegetation Map of South Africa, Lesotho, and Swaziland (VEGMAP) (SANBI, 2006–2018, 2018a). This map incorporates crucial recent updates specific to the region under investigation, as outlined by Dayaram et al. (2019). Additionally, conservation status and targets for various vegetation types were discerned through the National Biodiversity Assessment 2018.

3.2 Field survey

3.2.1 Terrestrial Vegetation Assessment

The field survey focused on identifying natural and untransformed vegetation, as well as unique features that could indicate local sensitivities, such as threatened and protected plants. This assessment was not an area-wide study but focused on 10 pre-determined points (50 m radius around) where the exploration would take place. Therefore, 50 m radial transects were assessed to determine the types of plants present. Within these transects, a timed random meander method was used. The survey was conducted towards the beginning of the winter season, and on the day of the assessment, it was raining (24 February 2026).

3.2.2 Terrestrial Animal Assessment

This assessment included observation of the presence or sign of wild animals associated with the recognised onsite habitat types. The following methods were employed for different groups:

- **Mammals:** Observations and spoor tracking.
- **Avifauna:** Point-count observations.
- **Herpetofauna and invertebrates:** Visual encounter surveys, active searching of termitaria and mole mounds.

3.3 Site Ecological Importance Assessment

3.3.1 Site Ecological Importance Assessment for Terrestrial Vegetation

The Site Ecological Importance evaluation was conducted following the SANBI: Species Environmental Assessment Guideline (2020). This evaluation aims to determine the following:

- The nature and the extent of the potential impact of the proposed development on species of conservation concern occurring on the proposed development site;
- The potential impact of the proposed development on the habitat of the species of conservation concern; and
- The potential impact of the proposed development on the habitat of the species of conservation concern; and
- Methods for the determination of Site Ecological Importance.

The criteria used are in Appendix B (Tables 1 to 7) of this assessment report.

3.3.2 Site Ecological Importance Assessment for Terrestrial Animals

The Site Ecological Importance evaluation was conducted following the SANBI: Species Environmental Assessment Guideline (2020). This evaluation aims to determine the following:

- The nature and the extent of the potential impact of the proposed development on species of conservation concern occurring on the proposed development site;
- The potential impact of the proposed development on the habitat of the species of conservation concern; and
- Methods for the determination of Site Ecological Importance.

The criteria used are in Appendix B (Tables 1 to 7) of this assessment report.

4. BACKGROUND TO THE STUDY SITE

4.1 Locality

The proposed prospecting area is located on Farm Lot 254/272/278 Empangeni 34 kilometres North-West of Empangeni, within the uMhlathuze Local Municipality in the King Cetshwayo District, KwaZulu-Natal Province (Figure 4.1). The total area of the proposed mining footprint is approximately 1 166.63 hectares.

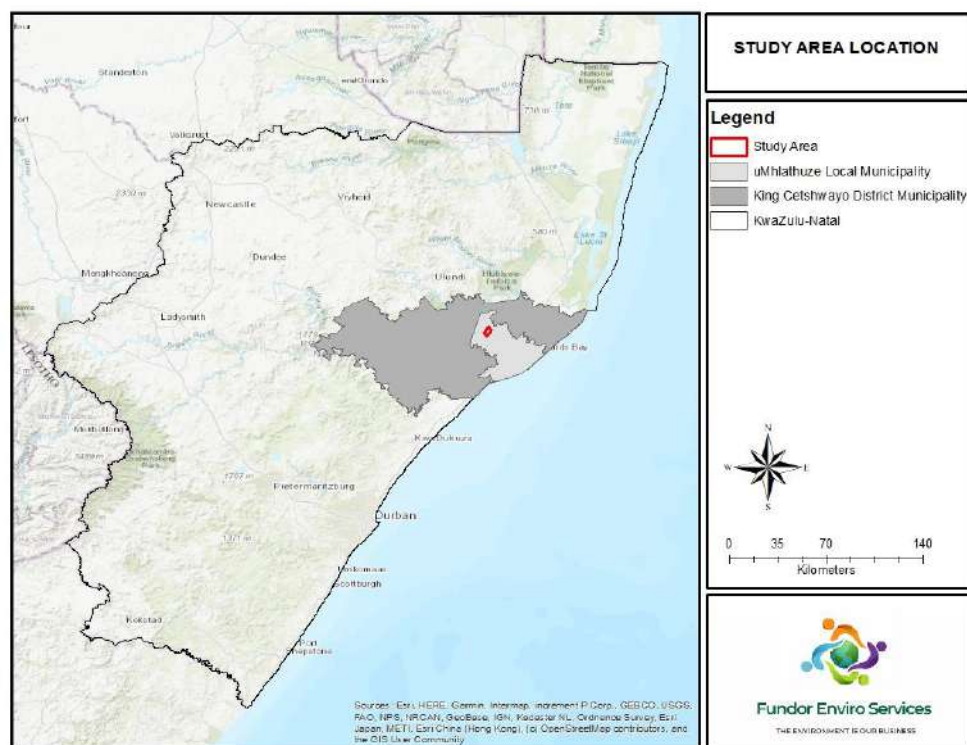


Figure 4.1: Location of the study area

4.2 Topography and the Existing Infrastructure

The intended activity is set to occur in an undulating landscape. The site's highest elevation reaches 255 meters above sea level, while the nearest lowest point sits at 85 meters above sea level (Figure 4.2).

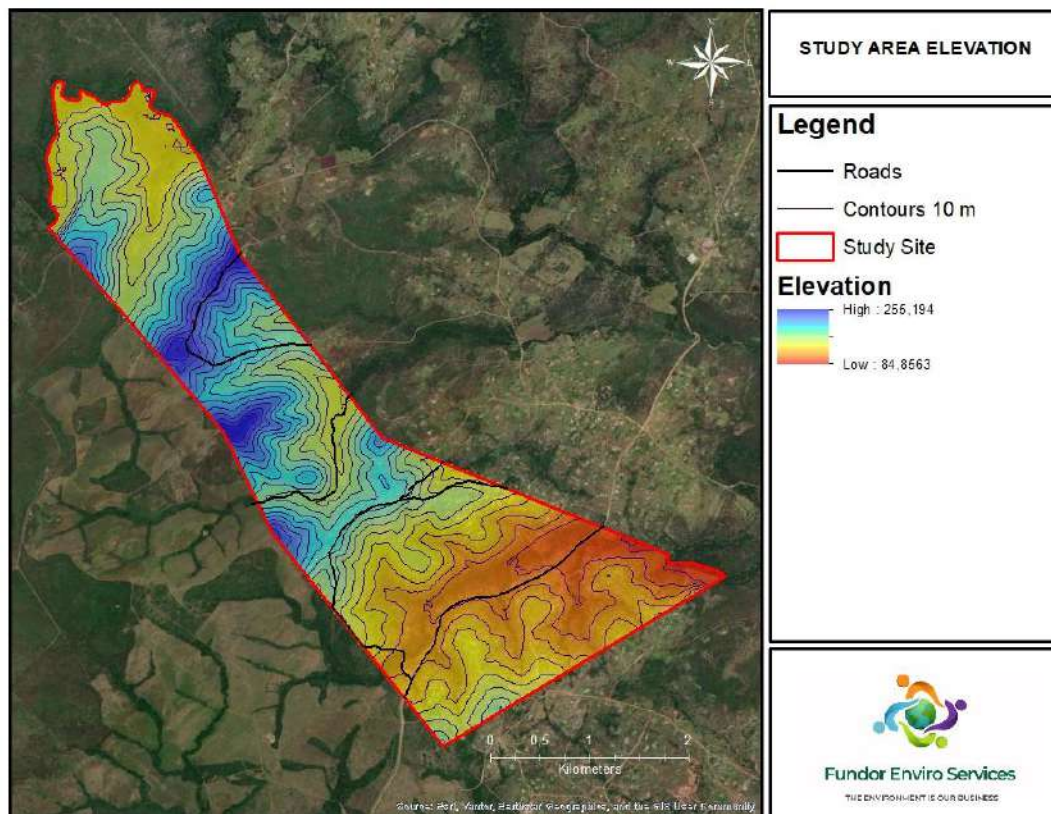


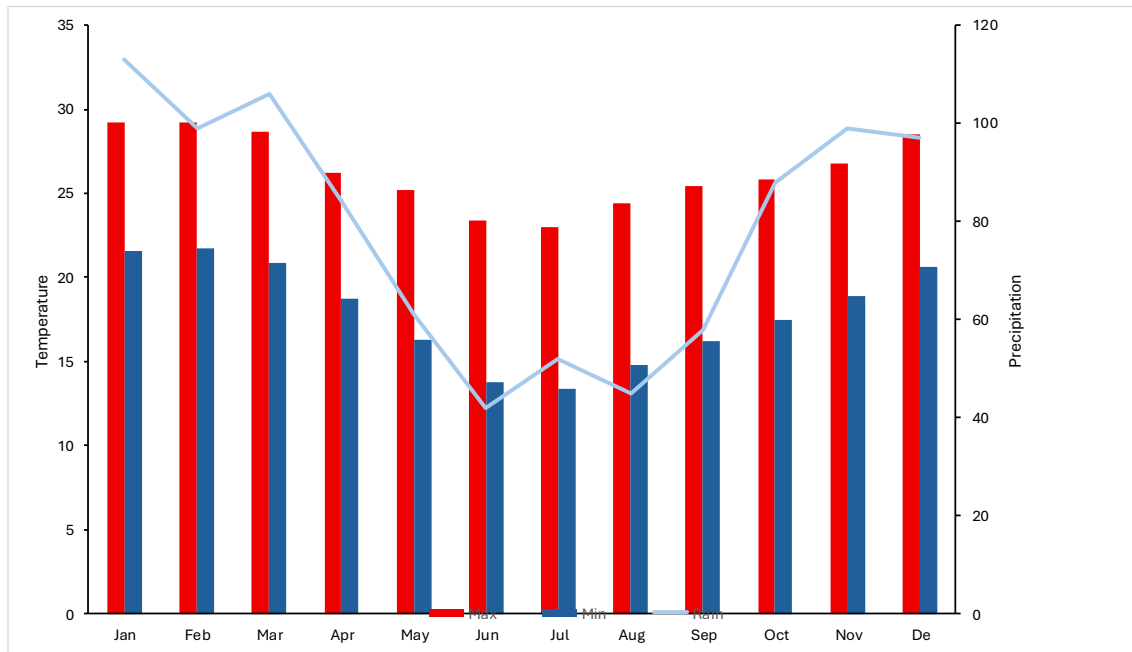
Figure 4.2: Topography of the study area

4.3 Geology and Soils

Black-clay soils and duplex soils derived from a distinct variety of clastic sediments of the Dwyka, Ecca, Beaufort and igneous rocks of the Lebombo Groups (all of the Karoo Supergroup). Also, well-drained soil forms occur especially on stony slopes. Land types Fb and Ea, with some Db and Dc.(Mucina & Rutherford, 2006 - 2018).

4.4 Climate

This region is well known for its temperature fluctuations, with temperatures ranging between 35 °C and 17 °C. Frost is frequent in this area. As a summer rainfall area, the overall mean annual precipitation is around 949 mm per year. This area experiences an orographic effect, which results in a locally higher precipitation than the adjacent areas (Mucina & Rutherford, 2006 - 2018). See Figure 4.3 for a climate chart of the study area.



Adapted from: en-Climate-data (2026)

Figure 4.3: Average temperatures and precipitation

5. VEGETATION ASSESSMENT

5.1 Study Area Vegetation Status

5.1.1 Vegetation Types and Conservation Statuses

According to the BGIS LUDS tool, the uMhlathuze Local Municipality is hectares in extent. About 37.07% of this municipality is in a natural state, and 62.73% has been transformed. The Municipality has three formal land-based provincial nature reserves, namely, Enseleni Nature Reserve, Richards Bay Game Reserve and Umlalaazi Nature Reserve. The Municipality does not have Ramsar sites.

5.1.2 Vegetation Types

There are three biomes in the municipality, namely the Indian Forests, Ocean Coastal Belt and the Savanna (Figure 5.1). Within these biomes, there are 10 vegetation types (Figure 5.2).

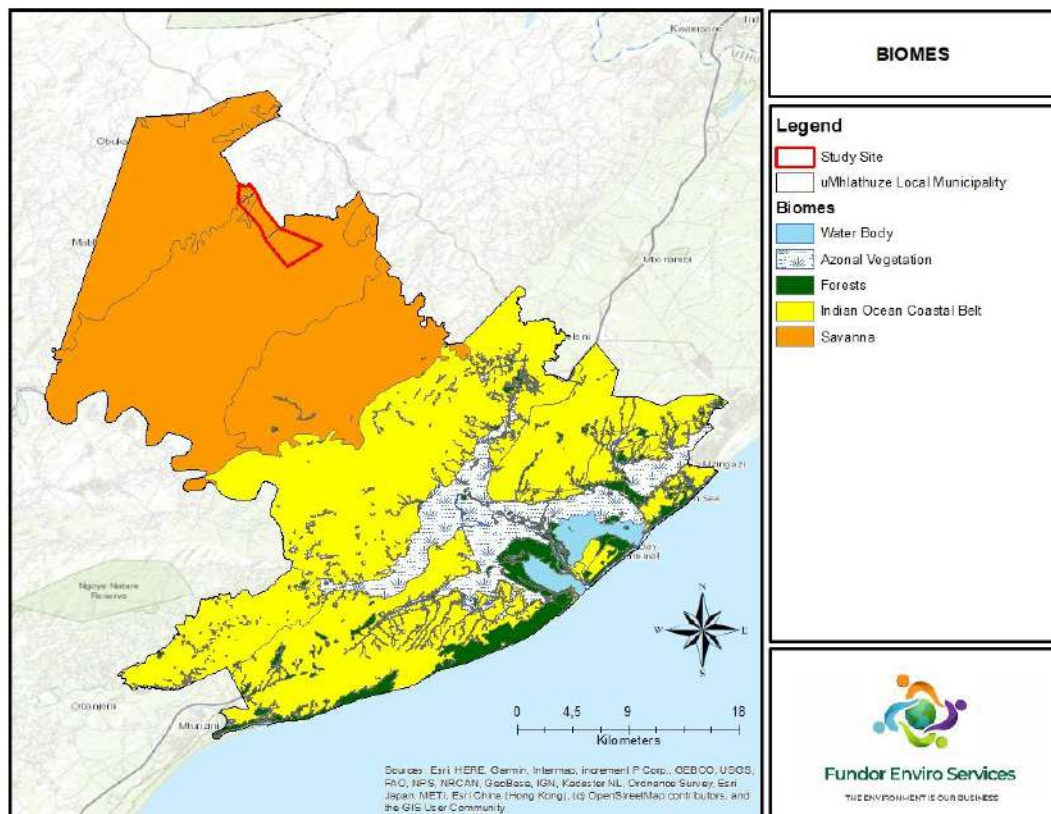


Figure 5.1: Biomes of uMhlathuze Local Municipality

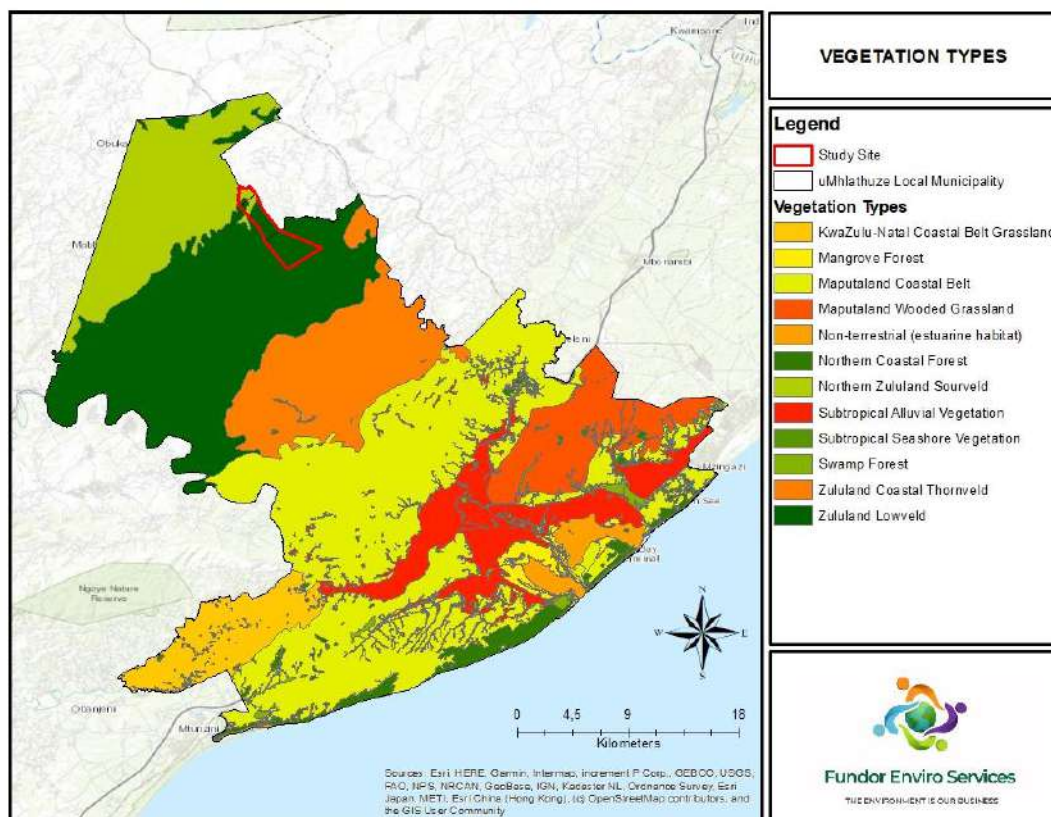


Figure 5.2: Vegetation types of uMhlathuze Local Municipality

5.1.3 Broad-scale Vegetation Patterns

Extensive flat or only slightly undulating landscapes supporting a complex of various bushveld units ranging from dense thickets of *Dichrostachys cinerea* and *Acacia* species, through park-like savanna with flat-topped *A. tortilis*, to tree-dominated woodland with broadleaved open bushveld with *Sclerocarya birrea* subsp. *caffra* and *A. nigrescens*. Tall grassveld types with sparsely scattered solitary trees and shrubs form a mosaic with the typical savanna thornveld, bushveld and thicket patches (Mucina & Rutherford, 2006 and 2018).

The site falls within the **Zululand Lowveld** and **Northern Zululand Sourveld** vegetation type of the Savanna Biome (see Figure 6) (Mucina & Rutherford, 2006, 2018). Table 1.1 lists plant types that occur in this vegetation type.

Table 1.1: Important taxa of the Zululand Lowveld vegetation

Tall Trees:	Small Trees:	Succulent Trees:	Tall Shrubs:	Low Shrubs
<i>Acacia burkei</i> (d)	<i>Acacia tortilis</i> subsp. <i>heteracantha</i> (d)	<i>Aloe marlothii</i> subsp. <i>marlothii</i>	<i>Dichrostachys cinerea</i> (d)	<i>Barleria obtusa</i>
<i>A. nigrescens</i> (d)	<i>A. gerrardii</i>	<i>Euphorbia grandidens</i>	<i>Euclea divinorum</i> (d)	<i>Crossandra greenstockii</i>
<i>Sclerocarya birrea</i> subsp. <i>caffra</i> (d)	<i>A. natalitia</i>	<i>E. ingens</i>	<i>Coptosperma supra-axillare</i>	<i>Felicia muricata</i>
	<i>A. nilotica</i>		<i>Crotalaria monteiri</i>	<i>Gymnosporia heterophylla</i>
	<i>A. senegal</i> var. <i>rostrata</i>		<i>Euclea crispa</i> subsp. <i>crispa</i>	<i>Indigofera trita</i> subsp. <i>subulata</i>
	<i>A. welwitschii</i> subsp. <i>welwitschii</i>		<i>E. schimperi</i>	<i>Justicia flava</i> ,
	<i>Boscia albitrunca</i>		<i>Galpinia transvaalica</i>	<i>J. protracta</i> subsp. <i>protracta</i>
	<i>Combretum apiculatum</i>		<i>Gardenia volkensii</i>	<i>Melhania didyma</i>
	<i>C. molle</i>		<i>Gymnosporia maranguensis</i>	<i>Orthosiphon serratus</i>
	<i>Ozoroa paniculosa</i>		<i>G. senegalensis</i>	<i>Pearsonia sessilifolia</i>
	<i>Phoenix reclinata</i>		<i>Jatropha zeyheri</i>	<i>Ruellia cordata</i>
	<i>Schotia brachypetala</i>		<i>Lycium acutifolium</i>	<i>Sida serratifolia</i>
	<i>Spirostachys africana</i>		<i>Olea europaea</i> subsp. <i>africana</i>	<i>Tetraselago natalensis</i>
	<i>Teclea gerrardii</i>		<i>Tarchonanthus parvicapitulatus</i>	
	<i>Ziziphus mucronata</i>		<i>Tephrosia polystachya</i>	
			<i>Triumfetta pilosa</i> var. <i>tomentosa</i>	
Succulent Shrubs:	Soft Shrub	Herbaceous Climber:	Graminoids:	Herbs:
<i>Euphorbia grandicornis</i>	<i>Pavonia columella</i>	<i>Fockea angustifolia</i>	<i>Dactyloctenium australe</i> (d),	<i>Acrotome hispida</i>
<i>E. trichadenia</i>			<i>Enteropogon monostachyus</i> (d)	<i>Argyrolobium rupestre</i>
<i>E. vandermerwei</i>			<i>Eragrostis capensis</i> (d)	<i>Aspilia mossambicensis</i>
			<i>E. curvula</i> (d)	<i>Chamaecrista biensis</i>

			<i>E. racemosa</i> (d)	<i>C. mimosoides</i>
			<i>Heteropogon contortus</i> (d)	<i>Corchorus asplenifolius</i>
			<i>Panicum maximum</i> (d)	<i>Felicia mossamedensis</i>
			<i>Sporobolus pyramidalis</i> (d)	<i>Gerbera ambigua</i>
			<i>Themeda triandra</i> (d)	<i>Helichrysum rugulosum</i>
			<i>Aristida bipartita</i>	<i>Hibiscus pusillus</i>
			<i>A. congesta</i>	<i>Kohautia virgata</i>
			<i>Bothriochloa insculpta</i>	<i>Lotononis eriantha</i>
			<i>Chloris mossambicensis</i>	<i>Senecio latifolius</i>
			<i>Cymbopogon caesius</i>	<i>Stachys aethiopica</i>
			<i>Digitaria natalensis</i>	<i>Tragia meyeriana</i>
			<i>Leptochloa eleusine</i>	<i>Vernonia capensis</i>
			<i>Panicum deustum</i>	
			<i>Schizachyrium sanguineum</i>	
			<i>Setaria incrassata</i>	
			<i>Sporobolus nitens</i>	
			<i>Trachypogon spicatus</i>	
			<i>Tristachya leucothrix</i>	
Succulent Herbs				
<i>Aloe parvibracteata</i>				

Table 1.2: Important taxa of the Northern Zululand Sourveld

Tall Trees:	Small Trees:	Succulent Shrub:	Woody Climber	Low Shrubs
<i>Gardenia volkensii</i>	<i>Acacia sieberiana</i> var. <i>woodii</i> (d)	<i>Aloe vanbalenii</i>	<i>Cryptolepis oblongifolia</i>	<i>Agathisanthemum bojeri</i>
<i>Gnidia caffra</i>	<i>A.natalitia</i>			<i>Chaetacanthus burchellii</i>
<i>G. kraussiana</i>	<i>A. nilotica</i>			<i>Crossandra fruticulosa</i>
	<i>A. tortilis</i> subsp. <i>heteracantha</i>			<i>C. greenstockii</i>

	<i>Plectroniella armata.</i>			<i>Diospyros galpinii</i>
				<i>Phyllanthus glaucophyllus</i>
				<i>Ruellia cordata</i>
				<i>Syncolostemon argenteus</i>
				<i>Tetraselago natalensis.</i>

Herbaceous Climber:	Graminoids:	Herbs:	Geophytic Herbs	Succulent Herbs:
<i>Cyphostemma schlechteri.</i>	<i>Eragrostis curvula (d)</i>	<i>Alepidea longifolia</i>	<i>Hypoxis hemerocallidea</i>	<i>Aloe minima</i>
	<i>Hyparrhenia hirta (d)</i>	<i>Argyrobium adscendens</i>	<i>Pachycarpus concolor.</i>	<i>A. parvibracteata</i>
	<i>Microchloa caffra (d)</i>	<i>Aster bakerianus</i>		<i>Senecio oxyriifolius.</i>
	<i>Themeda triandra (d)</i>	<i>Berkheya speciosa</i>		<i>Geoxylic Suffrutex:</i>
	<i>Tristachya leucothrix (d)</i>	<i>Chascanum hederaceum</i>		<i>Salacia kraussii.</i>
	<i>Alloteropsis semialata subsp. semialata</i>	<i>Crabbea hirsuta</i>		
	<i>Digitaria argyrograpta</i>	<i>Gazania krebsiana subsp. serrulata</i>		
	<i>D. tricholaenoides</i>	<i>Gerbera ambigua</i>		
	<i>Diheteropogon amplexans</i>	<i>Helichrysum mixtum</i>		
	<i>Elionurus muticus</i>	<i>H. nudifolium var. pilosellum</i>		
	<i>Loudetia simplex</i>	<i>Hemizygia pretoriae subsp. pretoriae</i>		
	<i>Trachypogon spicatus.</i>	<i>Hermannia grandistipula</i>		
		<i>Hypericum aethiopicum</i>		
		<i>Lichtensteinia interrupta</i>		
		<i>Pimpinella caffra</i>		
		<i>Senecio glaberrimus</i>		
		<i>S. latifolius</i>		
		<i>Stachys nigricans</i>		

		<i>Vernonia galpinii</i>		
		<i>V. oligocephala.</i>		

5.2 Fine-Scale Land Use and Vegetation Patterns

The proposed activity will involve drilling 10 geological cores. Each core size is 75.5 mm in diameter and about 100 metres in depth. This activity won't be concentrated on a single site; however, it will spread within the study site (see Figure 5.3). These points are either located closer to roads or farther from them. The cumulative distance of paths or roads that will be required to reach these points, and vegetation would need to be cleared for these roads to be made.

Regarding land cover and land use, the study area is dominated by tree cover, tree lines, freshwater ecosystems, and residential area. See Figure 5.3 for a vegetation map/land use map.

The site has two vegetation types: the Zululand Savanna Forest and the Gallery Savanna Forest. The Zululand Savanna Forest is characteristic of Zululand Lowveld vegetation. And the Gallery Savanna Forest is dominated by tall trees along the streams and rivers (see Figure 5.3). For analysis purposes, this study only assessed the Zululand Savanna Forest, where drill points will be placed.

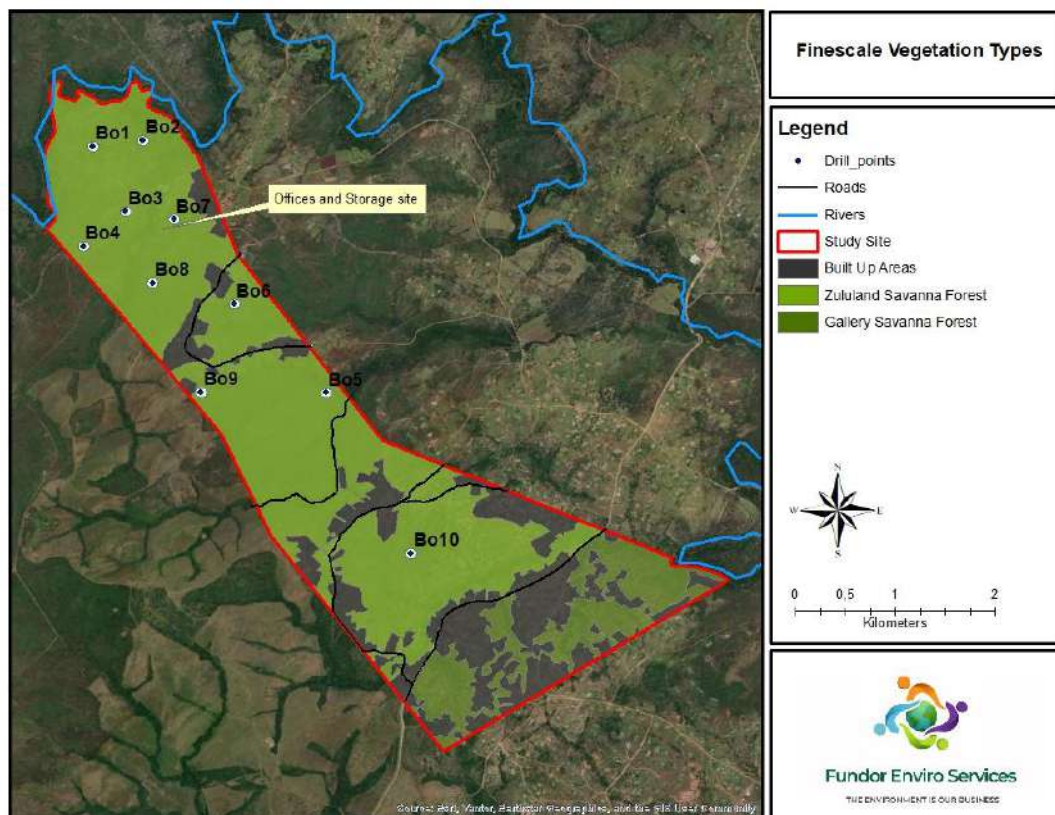


Figure 5.3: Study area fine-scale vegetation types

Table 5.1: Observed plant species

Graminoids:	Herbs:	Geophytic Herbs:	Low Shrubs:	Woody trees
<i>Digitaria natalensis</i>	<i>Helichrysum herbaceum</i>	<i>Ledebouria ovatifolia</i>	<i>Diospyros lycioides</i>	<i>Phoenix reclinata</i>
<i>Leptochloa eleusine</i>	<i>Helichrysum caespititium</i>		<i>Gymnosporia glaucophylla</i>	<i>Euclea natalensis</i>
<i>Panicum deustum</i>	<i>Berkheya speciosa</i>		<i>Barleroa obtusa</i>	<i>Schotia brachypetala</i>
<i>Setaria sphacelata</i>			<i>Rhoicissus tridentata</i>	<i>Ziziphus mucronata</i>
<i>Repens melinis</i>				<i>Scolopia zeyheri</i>
				<i>Phyllogeiton zeyheri</i>
				<i>Melia azedarach</i>
				<i>Dichrostachys cinerea</i>
				<i>Euclea racemosa</i>
				<i>Krassia floribunda</i>

Succulent				
<i>Aloe marlothii</i> <i>subsp. marlothii</i>				
<i>Euphorbia grandidens</i>				

6 CONSERVATION PLANS AND PROTECTED AREAS

The proposed prospecting right area falls within a National Protected Area Expansion Strategy (NPAES) Priority Focus Area, indicating the area's national conservation significance. The NPAES identifies landscapes that are ecologically intact and strategically important for achieving national protected area targets. Also, the land in question is being used as a protected area; however, based on desktop work, this land is not registered against these reserves.

This classification implies that the site contributes to the broader ecological connectivity of the region and that development or extractive activities are generally discouraged within such zones. However, given the very small and localised nature of the proposed activity (10 core drilling points, total footprint ± 0.012 ha) and the commitment to avoid additional clearing, rehabilitate immediately, and maintain ecological integrity, the overall biodiversity impact is expected to be low and manageable.

7 LISTED ECOSYSTEMS

The National Environmental Management: Biodiversity Act (Act 10 of 2004) provides for listing threatened or protected ecosystems in one of four categories: critically endangered (CR), endangered (EN), Vulnerable (VU) or Protected (Section 52(1)(a) of the National Environmental Management: Biodiversity Act (Government Gazette 34809, Government Notice 1002, 9 December 2011). The ecosystem status is based on the percentage of the original area remaining untransformed (by croplands, mining, urban development & roads) in relation to the biodiversity target and a threshold for ecosystem functioning. The purpose of listing threatened ecosystems is primarily to reduce the rate of ecosystem and species extinction. This includes preventing further degradation and loss of structure, function, and composition of threatened ecosystems.

According to Mucina and Rutherford (2024), the Zululand Lowveld and Northern Zululand Sourveld vegetation types are listed as Vulnerable.

8 KEY BIODIVERSITY AREAS

The proposed prospecting right area lies entirely within the Hluhluwe-Imfolozi Key Biodiversity Area (KBA), a site recognised as being of international conservation significance (Figure 8.1). Key Biodiversity Areas are sites that contribute significantly to the global persistence of biodiversity, as defined by the Global Standard for the Identification of KBAs (IUCN, 2016). This site qualifies as a Key Biodiversity Area of international significance that meets the thresholds for 3 criteria described in the Global Standard for the Identification of KBAs. Based on the available information, 6 species meet one or more KBA criteria for this site. The KBA trigger species at this site include mammals and plants. The site meets criterion A1 due to the presence of significant proportions of the global populations of 5 threatened species. The site regularly holds 2 individual geographically restricted species, therefore meeting criterion B1. A quantitative analysis of irreplaceability indicates that the site is 100% irreplaceable for the global persistence of 1 species, therefore meeting criterion E (Masterson *et al.*, 2025).

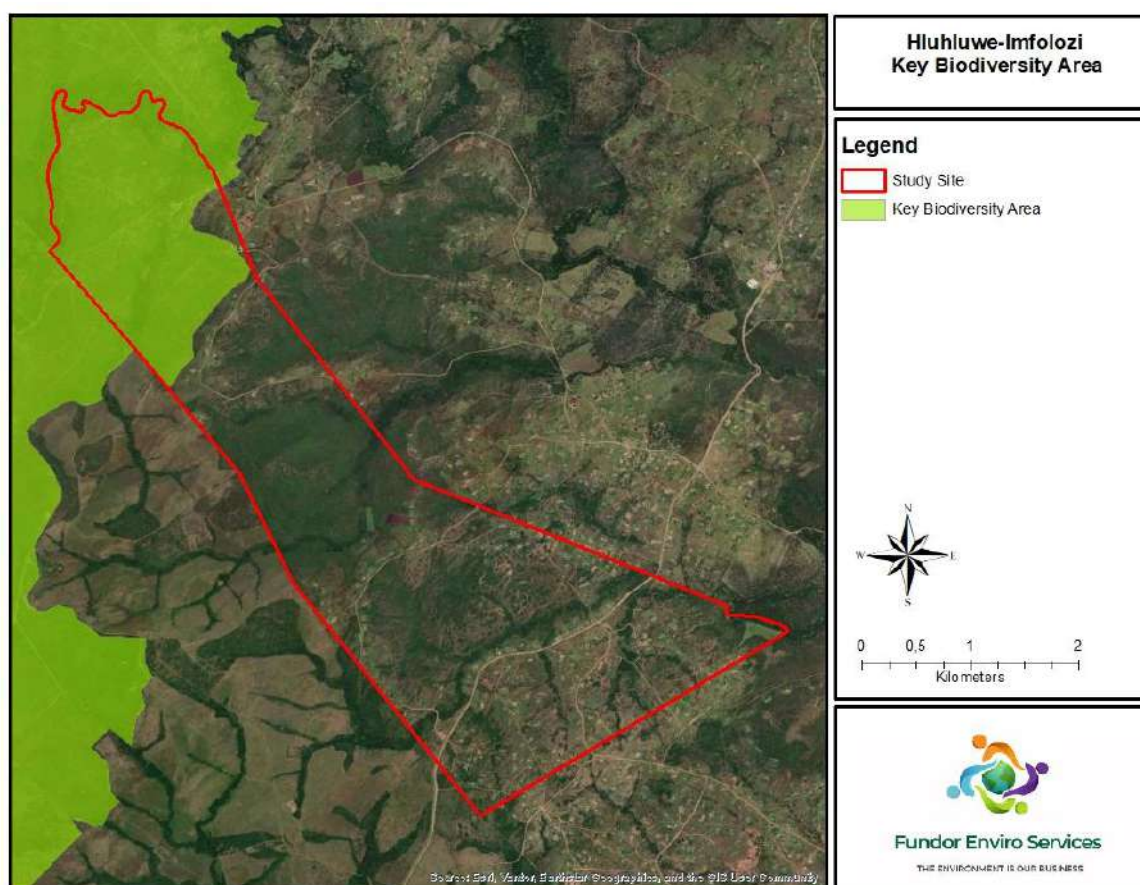


Figure 8.1: Study area in relation to the Hluhluwe-Imfolozi Key Biodiversity Area

According to Masterson *et al.* (2025), four (4) species within this KBA meet one or more KBA criteria:

Table 8.1: Drivers of Hluhluwe-Imfolozi Key Biodiversity Area

Taxonomix group	Scientific name		Common name	KBA criteria
Fabales	<i>Albizia suluensis</i>	EN	Zulu Albizia	A1a, B1
Mamalia	<i>Panthera leo</i>	VU	Lion	A1d
Mamalia	<i>Giraffa camelopardalis</i>	VU	Giraffe	Ad
Mammalia	<i>Lycaon pictus</i>	EN	African Wild dog	A1a

The Hluhluwe-Imfolozi Key Biodiversity Area, therefore, represents an area of exceptional ecological irreplaceability, supporting threatened, range-restricted, and endemic species, as well as a globally threatened ecosystem type. The KBA designation underscores the need to avoid habitat loss, fragmentation, or degradation that could compromise these conservation features.

9 KWAZULU-NATAL BIODIVERSITY SECTOR PLAN

The KwaZulu-Natal Biodiversity Sector Plan includes reference to Critical Biodiversity Areas (CBAs), which are terrestrial and aquatic features in the landscape that are critical for retaining

biodiversity and supporting continued ecosystem functioning and services (EKZNW, 2016). These form the key output of a systematic conservation assessment and are the biodiversity sector inputs into multi-sectoral planning and decision-making.

The CBAs, therefore, are areas of the landscape that need to be maintained in a natural or near-natural state to ensure the continued existence and functioning of species and ecosystems and the delivery of ecosystem services. In other words, if these areas are not maintained in a natural or near-natural state, then biodiversity conservation targets cannot be met. Maintaining an area in a natural state can include a variety of biodiversity-compatible land uses and resource uses (EKZNW, 2016). In addition, the conservation assessment also made provision for Ecological Support Areas (ESAs), which are areas that are not essential for meeting biodiversity representation targets/thresholds but play an important role in supporting the ecological functioning of critical biodiversity areas and/or in delivering ecosystem services that support socio-economic development, such as water provision, flood mitigation or carbon sequestration (Table 9.1).

Table 9.1: The two main layers, CBAs, and ESAs, are divided into further subcategories as set out below

Critical Biodiversity Areas (CBAs) - Crucial for supporting biodiversity features and ecosystem functioning and are required to meet conservation targets	
Critical Biodiversity Areas: Irreplaceable	These areas are considered critical for meeting biodiversity targets and thresholds, and which are required to ensure the persistence of viable populations of species and the functionality of ecosystems.
Critical Biodiversity Areas: Optimal	Areas that represent an optimised solution to meet the required biodiversity conservation targets while avoiding areas where the risk of biodiversity loss is high Category driven primarily by the process but is also informed by expert input.
Ecological Support Areas (ESAs) - Functional but not necessarily entirely natural areas that are required to ensure the persistence and maintenance of biodiversity patterns and ecological processes within the critical biodiversity areas	
Ecological Support Areas (ESAs)	Functional but not necessarily entirely natural areas that are required to ensure the persistence and maintenance of biodiversity patterns and ecological processes within the critical biodiversity areas. The area also contributes significantly to the maintenance of ecological infrastructure.
Ecological Support Areas: Species-Specific	Terrestrial-modified areas that provide a support function to a threatened or protected species, for example, agricultural land.

The proposed prospecting right area intersects mapped Critical Biodiversity Areas (CBAs) and Ecological Support Areas (ESAs) as per the KZN Biodiversity Plan (2020) (Figure 9.1).

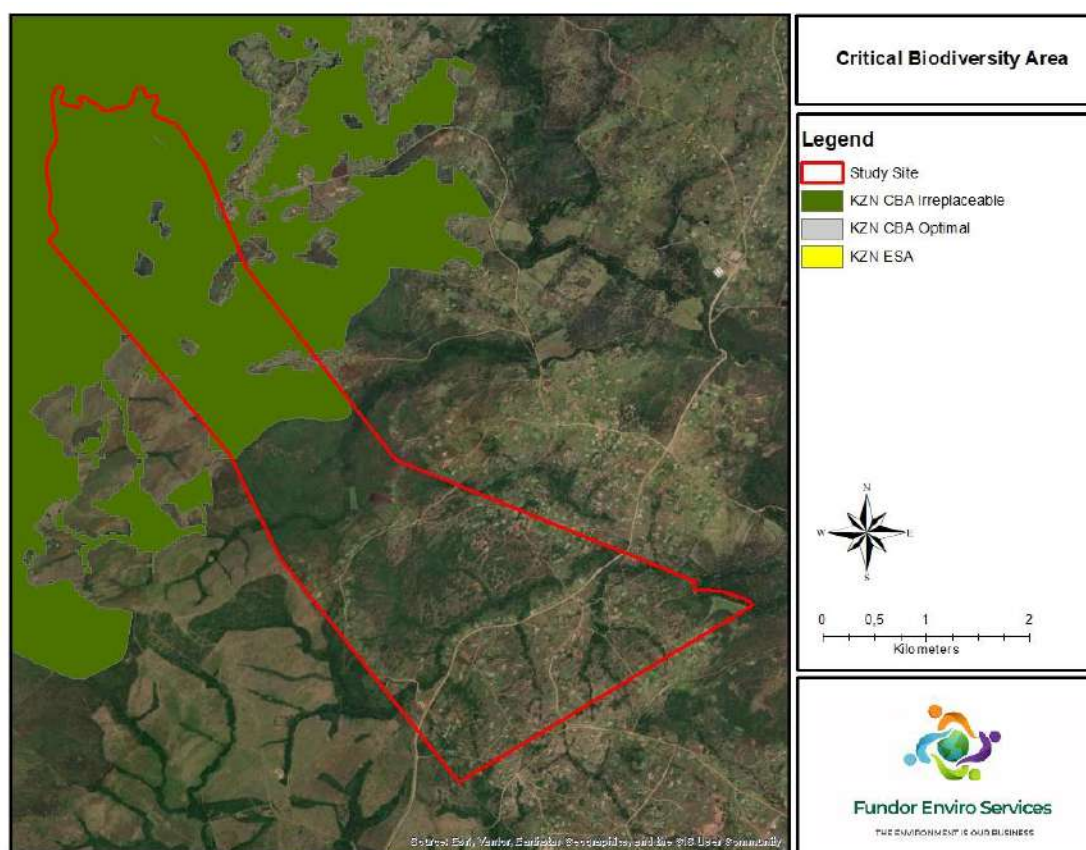


Figure 9.1: Map of Critical Biodiversity Areas

These areas are driven by key ecosystems, notably the Zululand lowveld and Northern Zululand Sourveld ecosystems and species listed in Table 10.2.

These biodiversity priority zones are integral to maintaining ecological connectivity, integrity, and broader ecological dynamics in the area. While the total prospecting footprint (10 drill points, ± 0.012 ha) is minimal, activities within or adjacent to CBAs/ESAs must be tightly controlled. Strict avoidance of intact habitats, no new access tracks, and immediate rehabilitation are required to ensure compliance with provincial conservation objectives and to prevent cumulative biodiversity degradation.

Table 9.2: Drivers of CBAs

Ave	<i>Gyps africanus</i>
Mammal	<i>Diceros bicornis minor</i>
Molusca	<i>Edouardia conulus</i>
Invertebrate	<i>Centrobolus fulgidus</i>
Invertebrate	<i>Zinophora laminate</i>
	Zululand lowveld
	Northern Zululand Sourveld



Figure 9.2: Map of relative terrestrial biodiversity theme sensitivity

Very High Sensitivity	High Sensitivity	Medium Sensitivity	Low Sensitivity
X			

Table 9.3: List of biodiversity sensitivities

Plant species	
Sensitivity	Features
Low	Low Sensitivity
Very High	CBA1
Very High	ESA: Species
Very High	National Protected Area Expansion Strategy (NPAES)

10 ALIEN INVASIVE PLANT SPECIES

The National Environmental Management: Biodiversity Act (NEMBA) is the most recent legislation pertaining to alien invasive plant species. The legislation calls for the removal and/or control of alien invasive plant species (Category 1 species). In addition, unless authorised thereto in terms of the National Water Act, 1998 (Act No. 36 of 1998), no land user shall allow Category 2 plants to occur within 30 meters of the 1:50 year flood line of a river, stream, spring, natural channel in which water flows regularly or intermittently, lake, dam, or wetland. Category 3 plants are also prohibited from occurring within proximity to a

watercourse. One invasive alien tree was observed in the area, in particular, along the forest margins (see Table 10.1).

Table 10.1: List of alien plant species occurring on site

SPECIES NAME	COMMON NAME	CATEGORY
<i>Melia azedarach</i>	Syringa berrytree	

Below is a brief explanation of the three categories in terms of the National Environmental Management: Biodiversity Act (Act 10 of 2004) (NEMBA):

- **Category 1a:** Invasive species requiring compulsory control. Remove and destroy. Any specimens of Category 1a listed species need, by law, to be eradicated from the environment. No permits will be issued.
- **Category 1b:** Invasive species requiring compulsory control as part of an invasive species control programme. Remove and destroy. These plants are deemed to have such a high invasive potential that infestations can qualify to be placed under a government-sponsored invasive species management programme. No permits will be issued.
- **Category 2:** Invasive species regulated by area. A demarcation permit is required to import, possess, grow, breed, move, sell, buy or accept as a gift any plants listed as Category 2 plants. No permits will be issued for Category 2 plants to exist in riparian zones.
- **Category 3:** Invasive species regulated by activity. An individual plant permit is required to undertake any of the following restricted activities (import, possess, grow, breed, move, sell, buy or accept as a gift) involving a Category 3 species. No permits will be issued for Category 3 plants to exist in riparian zones.

11 VEGETATION SENSITIVITY ANALYSIS

The Sensitivity Report generated from the National Web-based Environmental Screening Tool indicated that there are four (4) sensitive plant species with medium sensitivity (see Figure 11.1 and Table 11.1). However, during the on-site field survey, none of the sensitive species generated by the Screening Tool Report was identified on the specific sites. For analysis and reporting purposes, each species group's results will be presented separately.



Figure 11.1: National map of relative plant species theme sensitivity

Very High Sensitivity	High Sensitivity	Medium Sensitivity	Low Sensitivity
		X	

Table 11.1: List of sensitive plant species

Plant species	
Sensitivity	Features
Low	Low Sensitivity
Medium	<i>Salpinctium natalense</i>
Medium	Sensitive species 1076
Medium	<i>Oxygonum dregeanum</i> subsp. <i>streyi</i>
Medium	Sensitive species 191

11.1 Savanna Biome-sensitive species

Salpinctium natalense is a rare, herbaceous perennial endemic to KwaZulu-Natal, where it grows in the Savanna Biome, particularly in partial shade along the margins of Acacia scrub. It thrives in cool, shady environments and is well-suited to well-drained soils with moderate moisture. Ecologically, it is insect-pollinated, likely by butterflies or moths due to its narrow corolla tube. Its limited distribution and preference for shaded savanna edges contribute to its conservation status as a rare species. See Table 11.2 for this species' SEI.

Sensitive species 1076 is a succulent subshrub native to KwaZulu-Natal, South Africa, occurring within the subtropical biome where it occupies dry savanna and shrubland environments. It shows a strong preference for arid to semi-arid conditions, an adaptation evident in its succulent morphology that enables water conservation in well-drained, low-moisture soils. The species is known from its type locality in Zululand's Nongoma District near Mahlabatini, indicating a naturally restricted range within warm, dry landscapes. See Table 11.2 for this species' SEI.

Oxygonum dregeanum subsp. *streyi* occurs along the KwaZulu-Natal coast and southern Mozambique, where it inhabits coastal grasslands, palm veld, and various woodland-grassland mosaics, including Muzi Palm Veld and Wooded Grassland, Maputaland Sandy Bushveld, Zululand Lowveld, Tembe Sandy Bushveld, Pondoland-Ugu Sandstone Coastal Sourveld, and KwaZulu-Natal Coastal Belt Grassland. It typically grows in sandy soils within these ecosystems and shows a strong preference for open coastal grassland habitats that are maintained by natural disturbance such as fire. See Table 11.2 for this species' SEI.

Sensitive species 191, occurs along the east coast of South Africa and southern Mozambique, typically within 50 km of the sea, in environments protected from salt spray. It thrives across a range of habitats, including coastal grasslands, open dry grassland, scarp and coastal forests, and lightly shaded coastal parkland, demonstrating adaptability to conditions from full sun to deep shade. The species grows in sandy soils, granite-derived soils, and even heavy, slightly acidic black clays, indicating broad edaphic tolerance. Its distribution spans regions with 750–1000 mm annual rainfall, mostly in summer, and areas where frost is rare, aligning with its preference for warm, moist coastal climates. See Table 11.2 for this species' SEI.

Table 11.2: Plants SEI

Salpinctium natalense	Medium
Sensitive species 1076	Low
<i>Oxygonum dregeanum</i> subsp. <i>streyi</i>	Medium
Sensitive species 191	Low

12 ANIMAL ASSESSMENT

The following sub-sections will describe the available habitats for mammals, herpetofauna and avifauna. It should be noted that animals are mobile and can use the site and areas beyond it as a habitat, feeding ground and corridor.

12.1 Mammal assessment

The broad terrestrial habitat encompasses an extensive grassland system that extends beyond the study boundaries. There are high-lying areas that are grassy and rocky. Also, there are wetlands, streams, and riverine areas, which are also far from the boundaries of the study. These features of this area make it a suitable environment for wild animals. See Table 12.1 for the list of expected animals.

Table 12.1: List of mammals expected to occur on this site

COMMON NAME		SCIENTIFIC NAME	IUCN RED LIST	PROBABILITY OF OCCURRENCE
Forest	Shrew	<i>Myosorex varius</i>	LC	Medium
Least dwarf	Shrew	<i>Suncus infinitesimus</i>	LC	Medium
Lesser Red Musk	Shrew	<i>Crocidura hirta</i>	LC	Medium
Greater Red Musk	Shrew	<i>Crocidura flavescens</i>	LC	Medium
Hottentot's Golden	Mole	<i>Amblysomus hottentotus</i>	LC	Medium
Common	Mole-rats	<i>Cryptomys natalensis</i>	LC	High
Cape	Porcupine	<i>Hystrix africaeaustralis</i>	LC	High
Greater Cane	Rat	<i>Thryonomys swinderianus</i>	LC	Low
Angoni Vlei	Rat	<i>Otomys angoniensis</i>	LC	Low
Four-striped Grass	Mouse	<i>Rhabdomys dilectus</i>	LC	High
African Marsh	Rat	<i>Dasymys incomtus</i>	VU	Low
Pygmy	Mouse	<i>Mus minutoides</i>	LC	High
Natal ultimammate	Mouse	<i>Mastomys natalensis</i>	LC	High
Namaqua Rock	Mouse	<i>Micaelamys namaquensis</i>	LC	High
Highveld	Gerbil	<i>Gerbilliscus brantsii</i>	LC	Medium
White-tailed	Rat	<i>Mystromys albicaudatus</i>	VU	Medium
Brants' Climbing	Mouse	<i>Dendromus mesomelas</i>	LC	High
Chestnut African Climbing	Mouse	<i>Dendromus mystacalis</i>	LC	Medium
Scrub	Hares	<i>Lepus capensis</i>	LC	Medium
Natal Red Rock	hares	<i>Pronolagus crassicaudatus</i>	LC	Medium
Blue	Wildebeest	<i>Connochaetes taurinus taurinus</i>	LC	Low
Red	Hartebeest	<i>Alcelaphus buselaphus caama</i>	LC	High
Oribi	Oribi	<i>Ourebia ourebi ourebi</i>	EN	High
Steenbok	Steenbok	<i>Raphicerus campestris</i>	LC	Medium
Southern	Reedbuck	<i>Redunca arundinum</i>	LC	Medium
Aardwolf	Aardwolf	<i>Proteles cristata</i>	LC	Medium
Spotted	Hyaena	<i>Crocuta Crocuta</i>	NT	Low
Leopard	Leopard	<i>Panthera pardus</i>	VU	Medium
Caracal	Caracal	<i>Caracal caracal</i>	LC	Medium
Serval	Serval	<i>Leptailurus serval</i>	NT	Medium
Zorilla	Zorilla	<i>Ictonyx striatus</i>	LC	Medium
Slender	Mongoose	<i>Herpestes sanguineus</i>	LC	High

White-tailed	Mongoose	<i>Ichneumia albicauda</i>	LC	High
Banded	Mongoose	<i>Mungos mungo</i>	LC	High
Aardvark	Aardvark	<i>Orycteropus afer</i>	LC	Low
Vervet	Monkey	<i>Chlorocebus pygerythrus</i>	LC	High

12.2 Bird assessment

Amongst the faunal species being assessed, birds are the most mobile species. Thus, their habitat range is greatly extensive. This area supports bird species that prefer habitats that are dominated by thornveld and bushy ecosystems, and also those that use high-laying areas. All the birds listed have a medium to high probability of occurrence in the study site. See Table 12.2 for the list of expected bird species.

Table 12.2: List of birds expected to occur on this site (LC – Least Concern; NT – Near Threatened; VU – Vulnerable; EN – Endangered; DD – Data Deficient)

COMMON NAME		SCIENTIFIC NAME		REDLIST		PROBABILITY OF OCCURRENCE
Group Name	Common Name	Genus	Species	REGIONAL	GLOBAL	
Ostrich	Common	<i>Struthio</i>	<i>camelus</i>			M
Grebe	Little	<i>Tachybaptus</i>	<i>ruficollis</i>			L
Cormorant	White-breasted	<i>Phalacrocorax</i>	<i>lucidus</i>			L
Cormorant	Reed	<i>Microcarbo</i>	<i>africanus</i>			M
Darter	African	<i>Anhinga</i>	<i>rufa</i>			L
Heron	Grey	<i>Ardea</i>	<i>cinerea</i>			M
Heron	Black-headed	<i>Ardea</i>	<i>melanocephala</i>			L
Heron	Goliath	<i>Ardea</i>	<i>goliath</i>			L
Heron	Purple	<i>Ardea</i>	<i>purpurea</i>			L
Egret	Great	<i>Ardea</i>	<i>alba</i>			L
Egret	Western Cattle	<i>Bubulcus</i>	<i>ibis</i>			L
Heron	Striated	<i>Butorides</i>	<i>striata</i>			M
Night Heron	Black-crowned	<i>Nycticorax</i>	<i>nycticorax</i>			L
	Hamerkop	<i>Scopus</i>	<i>umbretta</i>			M
Openbill	African	<i>Anastomus</i>	<i>lamelligerus</i>			L
Stork	Yellow-billed	<i>Mycteria</i>	<i>ibis</i>			L
Stork	Woolly-necked	<i>Ciconia</i>	<i>episcopus</i>			M
Ibis	Hadada	<i>Bostrychia</i>	<i>hagedash</i>			H
Spoonbill	African	<i>Platalea</i>	<i>alba</i>			L
Goose	Spur-winged	<i>Plectropterus</i>	<i>gambensis</i>			L
Goose	Egyptian	<i>Alopochen</i>	<i>aegyptiaca</i>			H
Shoveler	Cape	<i>Anas</i>	<i>smithii</i>			L
Duck	African Black	<i>Anas</i>	<i>sparsa</i>			L
Teal	Red-billed	<i>Anas</i>	<i>erythrorhyncha</i>			L
Duck	White-faced Whistling	<i>Dendrocygna</i>	<i>viduata</i>			M

	Secretarybird	<i>Sagittarius</i>	<i>serpentarius</i>			L
Vulture	White-backed	<i>Gyps</i>	<i>africanus</i>			M
Vulture	Lappet-faced	<i>Torgos</i>	<i>tracheliotos</i>			L
Vulture	Palm-nut	<i>Gypohierax</i>	<i>angolensis</i>			L
Falcon	Lanner	<i>Falco</i>	<i>biarmicus</i>			L
Cuckoo-Hawk	African	<i>Aviceda</i>	<i>cuculoides</i>			L
Kite	Yellow-billed	<i>Milvus</i>	<i>aegyptius</i>			M
Kite	Black-winged	<i>Elanus</i>	<i>caeruleus</i>			L
Eagle	Tawny	<i>Aquila</i>	<i>rapax</i>			L
Eagle	Wahlberg's	<i>Hieraaetus</i>	<i>wahlbergi</i>			L
Eagle	Long-crested	<i>Lophaetus</i>	<i>occipitalis</i>			L
Eagle	Martial	<i>Polemaetus</i>	<i>bellicosus</i>			L
Eagle	Crowned	<i>Stephanoaetus</i>	<i>coronatus</i>			L
Snake Eagle	Brown	<i>Circaetus</i>	<i>cinereus</i>			L
Snake Eagle	Black-chested	<i>Circaetus</i>	<i>pectoralis</i>			L
Fish Eagle	African	<i>Haliaeetus</i>	<i>vocifer</i>			L
	Bateleur	<i>Terathopius</i>	<i>ECAUDATUS</i>			L
Buzzard	Jackal	<i>Buteo</i>	<i>rufofuscus</i>			L
Buzzard	Common	<i>Buteo</i>	<i>buteo</i>			L
Sparrowhawk	Black	<i>Accipiter</i>	<i>melanoleucus</i>			L
Goshawk	African	<i>Accipiter</i>	<i>tachiro</i>			L
Harrier	African Marsh	<i>Circus</i>	<i>ranivorus</i>			L
Harrier-Hawk	African	<i>Polyboroides</i>	<i>typus</i>			L
Francolin	Coqui	<i>Campocolinus</i>	<i>coqui</i>			L
Francolin	Crested	<i>Ortygornis</i>	<i>sephaena</i>			M
Spurfowl	Natal	<i>Pternistis</i>	<i>natalensis</i>			M
Quail	Common	<i>Coturnix</i>	<i>coturnix</i>			L
Guineafowl	Helmeted	<i>Numida</i>	<i>meleagris</i>			L
Buttonquail	Common	<i>Turnix</i>	<i>sylvaticus</i>			L

Crake	Baillon's	<i>Zaporina</i>	<i>pusilla</i>			L
Crake	Black	<i>Zaporina</i>	<i>flavirostra</i>			L
Swamphen	African	<i>Porphyrio</i>	<i>madagascariensis</i>			L
Moorhen	Common	<i>Gallinula</i>	<i>chloropus</i>			L
Finfoot	African	<i>Podica</i>	<i>senegalensis</i>			L
Bustard	Black-bellied	<i>Lissotis</i>	<i>melanogaster</i>			L
Jacana	African	<i>Actophilornis</i>	<i>africanus</i>			L
Plover	Kittlitz's	<i>Charadrius</i>	<i>pecuarius</i>			L
Plover	Three-banded	<i>Charadrius</i>	<i>tricolor</i>			M
Lapwing	Crowned	<i>Vanellus</i>	<i>coronatus</i>			L
Lapwing	Blacksmith	<i>Vanellus</i>	<i>armatus</i>			L
Lapwing	African Wattled	<i>Vanellus</i>	<i>senegallus</i>			L
	Ruff	<i>Calidris</i>	<i>pugnax</i>			L
Sandpiper	Common	<i>Actitis</i>	<i>hypoleucos</i>			L
Sandpiper	Green	<i>Tringa</i>	<i>ochropus</i>			L
Sandpiper	Marsh	<i>Tringa</i>	<i>stagnatilis</i>			L
Greenshank	Common	<i>Tringa</i>	<i>nebularia</i>			L
Sandpiper	Wood	<i>Tringa</i>	<i>glareola</i>			L
Thick-knee	Water	<i>Burhinus</i>	<i>vermiculatus</i>			M
Thick-knee	Spotted	<i>Burhinus</i>	<i>capensis</i>			L
Pigeon	Speckled	<i>Columba</i>	<i>guinea</i>			L
Dove	Red-eyed	<i>Streptopelia</i>	<i>semitorquata</i>			H
Dove	Ring-necked	<i>Streptopelia</i>	<i>capicola</i>			M
Dove	Laughing	<i>Spilopelia</i>	<i>senegalensis</i>			L
Dove	Namaqua	<i>Oena</i>	<i>capensis</i>			L
Dove	Tambourine	<i>Turtur</i>	<i>tympanistria</i>			M
Wood-Dove	Emerald-spotted	<i>Turtur</i>	<i>chalcospilos</i>			H
Pigeon	African Green	<i>Treron</i>	<i>calvus</i>			L
Turaco	Purple-crested	<i>Gallirex</i>	<i>porphyreolophus</i>			H

Cuckoo	African	<i>Cuculus</i>	<i>gularis</i>			L
Cuckoo	Red-chested	<i>Cuculus</i>	<i>solitarius</i>			L
Cuckoo	Black	<i>Cuculus</i>	<i>clamosus</i>			L
Cuckoo	Jacobin	<i>Clamator</i>	<i>jacobinus</i>			L
Cuckoo	African Emerald	<i>Chrysococcyx</i>	<i>cupreus</i>			L
Cuckoo	Klaas's	<i>Chrysococcyx</i>	<i>klaas</i>			L
Cuckoo	Diederik	<i>Chrysococcyx</i>	<i>caprius</i>			L
Owl	Western Barn	<i>Tyto</i>	<i>alba</i>			L
Owl	African Wood	<i>Strix</i>	<i>woodfordii</i>			L
Eagle-Owl	Spotted	<i>Bubo</i>	<i>africanus</i>			L
Nightjar	Fiery-necked	<i>Caprimulgus</i>	<i>pectoralis</i>			M
Swift	African Black	<i>Apus</i>	<i>barbatus</i>			L
Swift	White-rumped	<i>Apus</i>	<i>caffer</i>			L
Swift	Little	<i>Apus</i>	<i>affinis</i>			L
Swift	African Palm	<i>Cypsiurus</i>	<i>parvus</i>			M
Mousebird	Speckled	<i>Colius</i>	<i>striatus</i>			M
Mousebird	Red-faced	<i>Urocolius</i>	<i>indicus</i>			M
Trogon	Narina	<i>Apaloderma</i>	<i>narina</i>			L
Kingfisher	Pied	<i>Ceryle</i>	<i>rudis</i>			M
Kingfisher	Giant	<i>Megaceryle</i>	<i>maxima</i>			M
Kingfisher	Malachite	<i>Corythornis</i>	<i>cristatus</i>			M
Pygmy Kingfisher	African	<i>Ispidina</i>	<i>picta</i>			L
Kingfisher	Brown-hooded	<i>Halcyon</i>	<i>albiventris</i>			M
Kingfisher	Striped	<i>Halcyon</i>	<i>chelicuti</i>			L
Bee-eater	White-fronted	<i>Merops</i>	<i>bullockoides</i>			L
Bee-eater	Little	<i>Merops</i>	<i>pusillus</i>			L
Roller	European	<i>Coracias</i>	<i>garrulus</i>			L
Hoopoe	African	<i>Upupa</i>	<i>africana</i>			M
Wood Hoopoe	Green	<i>Phoeniculus</i>	<i>purpureus</i>			M

Scimitarbill	Common	<i>Rhinopomastus</i>	<i>cyanomelas</i>			L
Hornbill	Trumpeter	<i>Bycanistes</i>	<i>bucinator</i>			M
Hornbill	Crowned	<i>Lophoceros</i>	<i>alboterminatus</i>			M
Barbet	Black-collared	<i>Lybius</i>	<i>torquatus</i>			H
Barbet	Acacia Pied	<i>Tricholaema</i>	<i>leucomelas</i>			L
Barbet	White-eared	<i>Stactolaema</i>	<i>leucotis</i>			L
Tinkerbird	Red-fronted	<i>Pogoniulus</i>	<i>pusillus</i>			H
Tinkerbird	Yellow-rumped	<i>Pogoniulus</i>	<i>bilineatus</i>			M
Barbet	Crested	<i>Trachyphonus</i>	<i>vaillantii</i>			L
Honeyguide	Greater	<i>Indicator</i>	<i>indicator</i>			L
Honeyguide	Scaly-throated	<i>Indicator</i>	<i>variegatus</i>			L
Honeyguide	Lesser	<i>Indicator</i>	<i>minor</i>			M
Woodpecker	Golden-tailed	<i>Campethera</i>	<i>abingoni</i>			M
Woodpecker	Cardinal	<i>Dendropicos</i>	<i>fuscescens</i>			L
Lark	Rufous-naped	<i>Mirafr</i>	<i>africana</i>			L
Swallow	Barn	<i>Hirundo</i>	<i>rustica</i>			M
Swallow	White-throated	<i>Hirundo</i>	<i>albigularis</i>			L
Swallow	Wire-tailed	<i>Hirundo</i>	<i>smithii</i>			L
Swallow	Red-breasted	<i>Cecropis</i>	<i>semirufa</i>			L
Swallow	Lesser Striped	<i>Cecropis</i>	<i>abyssinica</i>			M
Martin	Brown-throated	<i>Riparia</i>	<i>paludicola</i>			L
Saw-wing	Black	<i>Psalidoprocne</i>	<i>pristoptera</i>			L
Cuckooshrike	Black	<i>Campephaga</i>	<i>flava</i>			L
Drongo	Fork-tailed	<i>Dicrurus</i>	<i>adsimilis</i>			H
Oriole	Eurasian Golden	<i>Oriolus</i>	<i>oriolus</i>			L
Oriole	Black-headed	<i>Oriolus</i>	<i>larvatus</i>			M
Crow	Pied	<i>Corvus</i>	<i>albus</i>			M
Tit	Southern Black	<i>Melaniparus</i>	<i>niger</i>			L
Bulbul	Dark-capped [x]	<i>Pycnonotus</i>	<i>tricolor</i>			H

Brownbul	Terrestrial	<i>Phyllastrephus</i>	<i>terrestris</i>			L
Greenbul	Yellow-bellied	<i>Chlorocichla</i>	<i>flaviventris</i>			M
Greenbul	Sombre	<i>Andropadus</i>	<i>importunus</i>			H
Thrush	Kurrichane	<i>Turdus</i>	<i>libonyana</i>			M
Rock-Thrush	Cape	<i>Monticola</i>	<i>rupestris</i>			L
Stonechat	African	<i>Saxicola</i>	<i>torquatus</i>			L
Robin-Chat	Chorister	<i>Cossypha</i>	<i>dichroa</i>			L
Robin-Chat	Red-capped	<i>Cossypha</i>	<i>natalensis</i>			H
Robin-Chat	White-browed	<i>Cossypha</i>	<i>heuglini</i>			L
Robin-Chat	Cape	<i>Cossypha</i>	<i>caffa</i>			L
Robin-Chat	White-throated	<i>Cossypha</i>	<i>humeralis</i>			L
Scrub Robin	Bearded	<i>Cercotrichas</i>	<i>quadrivirgata</i>			L
Scrub Robin	White-browed	<i>Cercotrichas</i>	<i>leucophrys</i>			H
Warbler	Garden	<i>Curruca</i>	<i>borin</i>			L
Warbler	Icterine	<i>Hippolais</i>	<i>icterina</i>			L
Warbler	Willow	<i>Phylloscopus</i>	<i>trochilus</i>			L
Warbler	Lesser Swamp	<i>Acrocephalus</i>	<i>gracilirostris</i>			L
Warbler	African Reed [x]	<i>Acrocephalus</i>	<i>baeticatus</i>			L
Warbler	Little Rush	<i>Bradypterus</i>	<i>baboecala</i>			L
Crombec	Long-billed	<i>Sylvietta</i>	<i>rufescens</i>			L
Apalis	Rudd's	<i>Apalis</i>	<i>ruddi</i>			M
Apalis	Yellow-breasted	<i>Apalis</i>	<i>flavida</i>			H
Camaroptera	Green-backed	<i>Camaroptera</i>	<i>brachyura brachyura</i>			H
Cisticola	Zitting	<i>Cisticola</i>	<i>juncidis</i>			L
	Neddicky	<i>Cisticola</i>	<i>fulvicapilla</i>			L
Cisticola	Rattling	<i>Cisticola</i>	<i>chiniana</i>			H
Cisticola	Red-faced	<i>Cisticola</i>	<i>erythrope</i>			M
Cisticola	Croaking	<i>Cisticola</i>	<i>natalensis</i>			L
Cisticola	Lazy	<i>Cisticola</i>	<i>aberrans</i>			L

Prinia	Tawny-flanked	<i>Prinia</i>	<i>subflava</i>			H
Flycatcher	Spotted	<i>Muscicapa</i>	<i>striata</i>			L
Flycatcher	African Dusky	<i>Muscicapa</i>	<i>adusta</i>			L
Flycatcher	Ashy	<i>Muscicapa</i>	<i>caerulescens</i>			L
Tit-Flycatcher	Grey	<i>Myioparus</i>	<i>plumbeus</i>			M
Flycatcher	Southern Black	<i>Melaenornis</i>	<i>pammelaina</i>			M
Flycatcher	Fiscal	<i>Melaenornis</i>	<i>silens</i>			L
Batis	Chinspot	<i>Batis</i>	<i>molitor</i>			H
Flycatcher	Blue-mantled Crested	<i>Trochocercus</i>	<i>cyanomelas</i>			L
Flycatcher	African Paradise	<i>Terpsiphone</i>	<i>viridis</i>			M
Wagtail	African Pied	<i>Motacilla</i>	<i>aguimp</i>			L
Wagtail	Cape	<i>Motacilla</i>	<i>capensis</i>			M
Wagtail	Mountain	<i>Motacilla</i>	<i>clara</i>			L
Pipit	African	<i>Anthus</i>	<i>cinnamomeus</i>			M
Pipit	Plain-backed	<i>Anthus</i>	<i>leucophrys</i>			L
Longclaw	Cape	<i>Macronyx</i>	<i>capensis</i>			L
Longclaw	Yellow-throated	<i>Macronyx</i>	<i>croceus</i>			M
Fiscal	Southern	<i>Lanius</i>	<i>collaris</i>			M
Shrike	Red-backed	<i>Lanius</i>	<i>collurio</i>			L
Boubou	Southern	<i>Laniarius</i>	<i>ferrugineus</i>			H
Puffback	Black-backed	<i>Dryoscopus</i>	<i>cubla</i>			H
Tchagra	Brown-crowned	<i>Tchagra</i>	<i>australis</i>			M
Tchagra	Black-crowned	<i>Tchagra</i>	<i>senegalus</i>			H
Bushshrike	Olive	<i>Chlorophoneus</i>	<i>olivaceus</i>			L
Bushshrike	Orange-breasted	<i>Chlorophoneus</i>	<i>sulfureopectus</i>			H
Bushshrike	Gorgeous	<i>Telophorus</i>	<i>viridis</i>			H
Bushshrike	Grey-headed	<i>Malaconotus</i>	<i>blanchoti</i>			L
Nicator	Eastern	<i>Nicator</i>	<i>gularis</i>			L
Helmetshrike	White-crested	<i>Prionops</i>	<i>plumatus</i>			L

	Brubru	<i>Nilaus</i>	<i>afer</i>			L
Myna	Common	<i>Acridotheres</i>	<i>tristis</i>			L
Starling	Violet-backed	<i>Cinnyricinclus</i>	<i>leucogaster</i>			L
Starling	Cape	<i>Lamprotornis</i>	<i>nitens</i>			H
Starling	Black-bellied	<i>Notopholia</i>	<i>corrusca</i>			M
Starling	Red-winged	<i>Onychognathus</i>	<i>morio</i>			L
Oxpecker	Red-billed	<i>Buphagus</i>	<i>erythrorhynchus</i>			L
Sunbird	Purple-banded	<i>Cinnyris</i>	<i>bifasciatus</i>			L
Sunbird	White-bellied	<i>Cinnyris</i>	<i>talatala</i>			M
Sunbird	Grey	<i>Cyanomitra</i>	<i>veroxii</i>			M
Sunbird	Olive	<i>Cyanomitra</i>	<i>olivacea</i>			L
Sunbird	Collared	<i>Hedydipna</i>	<i>collaris</i>			L
Sunbird	Amethyst	<i>Chalcomitra</i>	<i>amethystina</i>			L
Sunbird	Scarlet-chested	<i>Chalcomitra</i>	<i>senegalensis</i>			M
Sparrow	House	<i>Passer</i>	<i>domesticus</i>			L
Sparrow	Yellow-throated Bush	<i>Gymnoris</i>	<i>superciliaris</i>			M
Weaver	Dark-backed	<i>Ploceus</i>	<i>bicolor</i>			M
Weaver	Spectacled	<i>Ploceus</i>	<i>ocularis</i>			M
Weaver	Lesser Masked	<i>Ploceus</i>	<i>intermedius</i>			L
Weaver	Village	<i>Ploceus</i>	<i>cucullatus</i>			M
Weaver	Eastern Golden	<i>Ploceus</i>	<i>subaureus</i>			L
Weaver	Thick-billed	<i>Amblyospiza</i>	<i>albifrons</i>			M
Quelea	Red-billed	<i>Quelea</i>	<i>quelea</i>			L
Red Bishop	Southern	<i>Euplectes</i>	<i>orix</i>			M
Widowbird	Red-collared	<i>Euplectes</i>	<i>ardens</i>			L
Widowbird	White-winged	<i>Euplectes</i>	<i>albonotatus</i>			L
Widowbird	Fan-tailed	<i>Euplectes</i>	<i>axillaris</i>			M
Mannikin	Bronze	<i>Lonchura</i>	<i>cucullata</i>			L
Mannikin	Red-backed	<i>Lonchura</i>	<i>nigriceps</i>			L

Waxbill	Swee	<i>Coccopygia</i>	<i>melanotis</i>			L
Pytilia	Green-winged	<i>Pytilia</i>	<i>melba</i>			L
Firefinch	African	<i>Lagonosticta</i>	<i>rubricata</i>			M
Firefinch	Red-billed	<i>Lagonosticta</i>	<i>senegala</i>			M
Waxbill	Blue	<i>Uraeginthus</i>	<i>angolensis</i>			M
Waxbill	Grey	<i>Glaucestrilda</i>	<i>perreini</i>			L
Waxbill	Common	<i>Estrilda</i>	<i>astrild</i>			M
	Quailfinch	<i>Ortygospiza</i>	<i>atricollis</i>			L
Whydah	Pin-tailed	<i>Vidua</i>	<i>macroura</i>			M
Indigobird	Dusky	<i>Vidua</i>	<i>funerea</i>			L
Indigobird	Village	<i>Vidua</i>	<i>chalybeata</i>			L
Whydah	Long-tailed Paradise	<i>Vidua</i>	<i>paradisaea</i>			L
Canary	Yellow-fronted	<i>Crithagra</i>	<i>mozambica</i>			H
Canary	Brimstone	<i>Crithagra</i>	<i>sulphurata</i>			L
Bunting	Golden-breasted	<i>Emberiza</i>	<i>flaviventris</i>			M
Falcon	Sooty	<i>Falco</i>	<i>concolor</i>			L
White-eye	Cape	<i>Zosterops</i>	<i>virens</i>			M
Coucal	Burchell's	<i>Centropus</i>	<i>burchellii</i>			M
Cisticola	Rufous-winged	<i>Cisticola</i>	<i>galactotes</i>			L
Sparrow	Southern Grey-headed	<i>Passer</i>	<i>diffusus</i>			M

12.3 Herpetofauna assessment

Most species in this group are extremely secretive and difficult to observe during field surveys. Table 12.3 (reptiles) and Table 12.4 (amphibians) below list the expected herpetofauna species to occur on this site.

Table 12.3: List of reptiles expected to occur on this site

COMMON NAME	SCIENTIFIC NAME	IUCN RED LIST	PROBABILITY OF OCCURRENCE
Kwazulu-Natal Hinged-Back Tortoise	<i>Kinixys natalensis</i>	LC	High
Eastern Hinged-Back Tortoise	<i>Kinixys zombensis</i>	LC	High
Nile Crocodile	<i>Crocodylus niloticus</i>	VU	Low
Pondo Flat Gecko	<i>Afroedura pondolia</i>	LC	Low
Common Tropical House Gecko	<i>Hemidactylus mabouia</i>	LC	High
Wahlberg's Velvet Gecko	<i>Homopholis wahlbergii</i>	LC	High
Common Dwarf Gecko;	<i>Lygodactylus capensis capensis</i>	LC	Medium
Spotted Gecko;	<i>Pachydactylus maculatus</i>	LC	Medium
Van Son's Gecko;	<i>Pachydactylus vansonii</i>	LC	Low
Large-Scaled Grass Lizard	<i>Chamaesaura macrolepis</i>	NT	Medium
Yellow-Throated Plated Lizard	<i>Gerrhosaurus flavigularis</i>	LC	Medium
Eastern Long-Tailed Seps	<i>Tetradactylus africanus</i>	LC	High
Giant Legless Skink	<i>Acontias plumbeus</i>	LC	Medium
Wahlberg's Snake-Eyed Skink	<i>Afroablepharus wahlbergii</i>	LC	High
Cape Skink	<i>Trachylepis capensis</i>	LC	High
Striped Skink	<i>Trachylepis striata</i>	LC	High
Mozambique Dwarf Burrowing Skink	<i>Scelotes mossambicus</i>	LC	Medium
Southern Rock Monitor	<i>Varanus albigularis albigularis</i>	LC	High
Common Flap-Neck Chameleon	<i>Chamaeleo dilepis dilepis</i>	LC	High
Eastern Ground Agama	<i>Agama aculeata distanti</i>	LC	High
Southern Tree Agama	<i>Acanthocercus atricollis atricollis</i>	LC	High
Bibron's Blind Snake	<i>Afrotyphlops bibronii</i>	LC	High
Peters' Thread Snake	<i>Leptotyphlops scutifrons</i>	LC	Medium
Southern African Python	<i>Python natalensis</i>	LC	High
Puff Adder	<i>Bitis arietans arietans</i>	LC	High
Snouted Night Adder	<i>Causus defilippii</i>	LC	Medium
Common Purple-Glossed Snake	<i>Amblyodipsas polylepis Polylepis</i>	LC	Medium
Black-Headed Centipede-Eater	<i>Aparallactus capensis</i>	LC	Medium
Bibron's Stiletto Snake	<i>Atractaspis bibronii</i>	LC	Medium
Striped Harlequin Snake	<i>Homoroselaps dorsalis</i>	NT	Medium
Common House Snake	<i>Boaedon capensis</i>	LC	High
Common File Snake	<i>Gonionotophis capensis capensis</i>	LC	Medium
Olive Ground Snake	<i>Lycodonomorphus inornatus</i>	LC	Medium
Cape Wolf Snake	<i>Lycophidion capense capense</i>	LC	Medium

Short-Snouted Grass Snake	<i>Psammophis brevirostris</i>	LC	Medium
Olive Grass Snake	<i>Psammophis mossambicus</i>	LC	Medium
Spotted Grass Snake	<i>Psammophylax rhombeatus</i>	LC	Medium
South African Slug-Eater	<i>Duberria lutrix lutrix</i>	LC	Medium
East African Shovel-Snout	<i>Prosymna stuhlmannii</i>	LC	Medium
Mole Snake	<i>Pseudaspis cana</i>	LC	Medium
Eastern Green Mamba	<i>Dendroaspis angusticeps</i>	VU	High
Black Mamba	<i>Dendroaspis Polylepis</i>	LC	High
Forest Cobra	<i>Naja melanoleuca</i>	LC	Medium
Mozambique Spitting Cobra	<i>Naja mossambica</i>	LC	High
Red-Lipped Snake	<i>Crotaphopeltis hotamboeia</i>	LC	Medium
Southern Brown Egg-Eater	<i>Dasypeltis inornata</i>	LC	Medium
Rhombic Egg-Eater	<i>Dasypeltis scabra</i>	LC	Medium
Boomslang	<i>Dispholidus typus</i>	LC	High
Eastern Natal Green Snake	<i>Philothamnus natalensis natalensis</i>	LC	High
Spotted Bush Snake	<i>Philothamnus semivariegatus</i>	LC	High

LC – Least Concern; NT – Near Threatened; VU – Vulnerable; EN – Endangered; DD – Data Deficient

Table 12.4: List of amphibians expected to occur on this site

COMMON NAME	SCIENTIFIC NAME	IUCN RED LIST	PROBABILITY OF OCCURRENCE
Bush Squeaker	<i>Arthroleptis wahlbergi</i>		Medium
Guttural Toad	<i>Bufo gutturalis</i>		High
Red Toad	<i>Schismaderma carens</i>		High
Spotted Shovel-nosed Frog	<i>Hemisus guttatus</i>	VU	Medium
Golden Leaf-folding Frog	<i>Afixalus aureus</i>		Low
Greater Leaf-folding Frog	<i>Afixalus fornasinii</i>		Low
Painted Reed Frog	<i>Hyperolius marmoratus</i>		Medium
Water Lily Frog	<i>Hyperolius pusillus</i>		Low
Tinker Reed Frog	<i>Hyperolius tuberilinguis</i>		Medium
Bubbling Kassina	<i>Kassina senegalensis</i>		Medium
Brown-backed Tree Frog	<i>Leptopelis mossambicus</i>		High
Natal Tree Frog	<i>Leptopelis natalensis</i>		Medium
Mozambique Rain Frog	<i>Breviceps mossambicus</i>		Medium
Boettger's Caco	<i>Cacosternum boettgeri</i>		Medium

LC – Least Concern; NT – Near Threatened; VU – Vulnerable; EN – Endangered; DD – Data Deficient

12.4 Animal Species Habitat Use and Distribution

Habitat use, defined as the proportion of time animals spend in specific environments, varies considerably across avian (bird), mammalian, and invertebrate species. Birds demonstrate diverse habitat preferences, from wetlands to forests, with adaptations tailored to each

ecological niche. Seasonal migration further influences avian habitat use, as birds traverse vast distances between breeding and wintering grounds. Mammals exhibit a wide range of habitat preferences, influenced by factors like food availability and shelter, with some species occupying specialised environments like caves. Human activities, such as urbanisation and deforestation, can disrupt mammalian habitat use, leading to habitat loss and fragmentation. Invertebrates, encompassing a broad array of organisms, occupy almost every imaginable habitat, from soil to extreme environments like deep-sea vents. Despite their small size, invertebrates play crucial roles in ecosystems as pollinators and decomposers.

The site has a variety of habitats for various species, and even though it is a farm, the land use change is very minimal. Therefore, supporting a variety of species.

12.5 Animal Species Sensitivity

The Sensitivity Report generated from the National Web-based Environmental Screening Tool identified 17 animal species of conservation concern within the project area (Table 12.5 and Figure 12.1). Of these, two species were confirmed during the site assessment, namely *Aquila rapax* and *Deloneura millari millari*. The northern portion of the site is still in its natural and intact state, and it is therefore likely that additional faunal species occur within the broader landscape. Furthermore, species that are not directly dependent on aquatic habitats may also utilise the site for foraging, movement, or other ecological functions. For the purposes of analysis and reporting in this assessment, the findings are presented according to the relevant species groups.

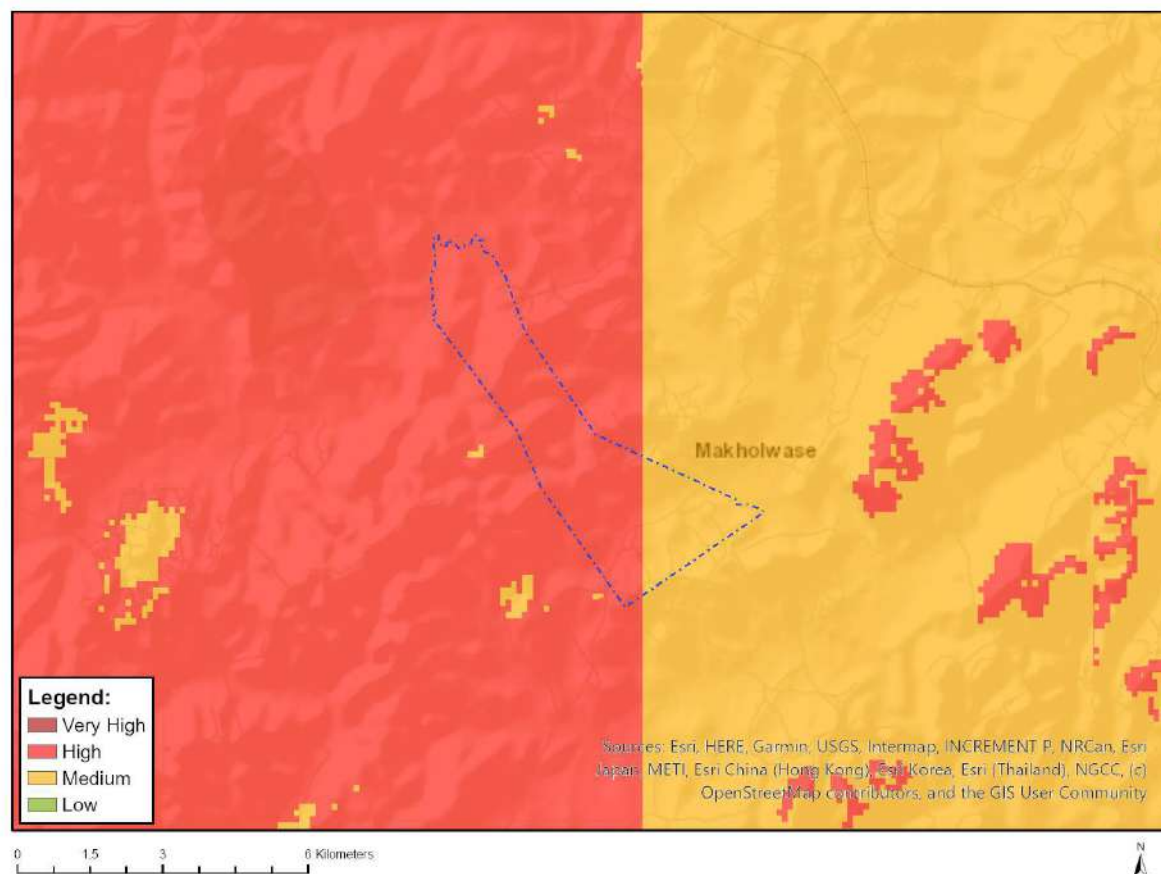


Figure 12.1: National map of relative animal species theme sensitivity

Very High Sensitivity	High Sensitivity	Medium Sensitivity	Low Sensitivity
	X		

Table 12.5: List of sensitive animal species

Animal species	
Sensitivity	Features
High	Aves-Terathopius ecaudatus
High	Aves-Aquila rapax
High	Aves-Circus ranivorus
High	Aves-Torgos tracheliotos
High	Aves-Polemaetus bellicosus
High	Aves-Bucorvus leadbeateri
High	Aves-Gyps africanus
High	Aves-Stephanoaetus coronatus
Medium	Aves-Circus ranivorus
Medium	Aves-Terathopius ecaudatus
Medium	Aves-Aquila rapax
Medium	Aves-Gyps africanus
Medium	Aves-Stephanoaetus coronatus
Medium	Insecta-Deloneura millari millari
Medium	Insecta-Iolaus diametra natalica
Medium	Sensitive species 5
Medium	Mammalia-Lycan pictus

Medium	Sensitive species 8
Medium	Reptilia-Crocodylus niloticus
Medium	Reptilia-Kinixys natalensis
Medium	Invertebrate-Arytropteris basalis
Medium	Invertebrate-Pomatonota dregii

13.5.1 Avian-sensitive species

The Grassland system has a Very Low to High SEI for all the avian species. See the table, which provides the sensitivity of each habitat type.

Terathopius ecaudatus, commonly known as the Bateleur, occurs widely across sub-Saharan Africa, generally favouring open savanna, woodland, and semi-arid habitats, including arid Acacia savanna, miombo woodland, and Mopane woodland, often where tall woodland and drainage-line vegetation are present. It is typically absent from dense, closed forests and lowland rainforest regions but may occur in semi-desert shrubland where scattered trees remain. The species is highly aerial and relies on these open habitats for soaring, foraging, and scavenging, while requiring large territories for effective hunting.

Aquila rapax inhabits open, dry habitats across Africa and parts of Asia, favouring semideserts, deserts, dry steppes, open savanna plains, lightly wooded savanna, and open grasslands, while generally avoiding dense forests. It also occurs in open woodlands, Nama Karoo, mountainous regions, cultivated steppes, and agricultural landscapes, provided scattered trees or structures are available for nesting. Although adapted to arid environments, it seldom occupies areas completely without trees. Overall, the species thrives in broad, open terrains with sparse to moderate tree cover that support both hunting and scavenging behaviour.

Gyps africanus, the white-backed vulture, inhabits savannas, open woodlands, and wooded or semi-arid plains across sub-Saharan Africa, where it is strongly associated with landscapes that support abundant large ungulates whose carcasses provide its primary food source. It ranges widely from West Africa through the Sahel to East and southern Africa, thriving especially in savanna ecosystems and open woodland areas where tall trees are available for roosting and colonial nesting. The species is an obligate scavenger and depends on open habitats that facilitate soaring flight and carcass detection.

Circus ranivorus primarily inhabits wetland ecosystems, favouring marshes, reedbeds, floodplains, lake margins, and well-vegetated river edges across southern, central, and eastern Africa. It hunts extensively over open grasslands, cultivated lands near wetlands, and

damp coastal or inland areas, and is generally absent from arid or low-rainfall regions, requiring moist habitats with sufficient vegetation cover. The species occurs from sea level to about 3,000 m, though it is most common above 1,500 m, particularly in higher-rainfall zones such as coastal regions and the Okavango Delta, which is considered a population stronghold.

Stephanoaetus coronatus is a predominantly forest-associated raptor that occupies lowland and montane evergreen forests, riparian woodlands, dense woodland, forested ravines, gorges, and occasionally wooded savannas or exotic tree plantations across sub-Saharan Africa. It shows a strong affinity for mature, well-canopied forests, particularly along river systems and escarpments, and is most common in forest-rich regions such as parts of West Africa, the Congo Basin, East Africa, and the eastern parts of southern Africa, including KwaZulu-Natal and the Eastern Cape. Although it tolerates some habitat modification, the species declines where forest cover is reduced, making it highly dependent on intact or semi-intact forest ecosystems.

Torgos tracheliotos inhabits dry savannas, arid and semi-arid plains, thornbush, desert landscapes with scattered trees, and open mountain slopes, favouring undisturbed open country with minimal grass cover across much of Africa and parts of the Arabian Peninsula. It is typically associated with open, sparsely vegetated habitats, where its large size and soaring flight style enable efficient scavenging, and it ranges from sea level to 4,500 m. While it primarily avoids dense vegetation, it may wander into more wooded or human-inhabited areas when attracted to carcasses, including roadkill.

Polemaetus bellicosus occupies open habitats across sub-Saharan Africa, favouring savannas, open woodland, scrublands, semi-deserts, and steppe environments, while generally avoiding dense forests. It requires large trees or tall structures such as power pylons for nesting and is most abundant in protected areas where prey availability is stable. The species ranges from sea level to around 3,000 m, occurring sparsely but widely from West Africa through East Africa and into southern Africa, where it remains more common in regions like Zimbabwe, South Africa, Namibia, and large conservation landscapes.

Bucorvus leadbeateri (southern ground hornbill) is a large, terrestrial bird of open savanna and grassland ecosystems interspersed with scattered trees, where it requires extensive, relatively undisturbed territories for foraging and breeding. It favours open woodland, bushveld, and lightly wooded grassland with short to medium grass cover that allows efficient ground foraging for insects, reptiles, small mammals, and amphibians. Tall, mature trees—

particularly large indigenous species—are essential for nesting, as the species breeds exclusively in tree cavities.

Avian-sensitive species	
<i>Terathopius ecaudatus</i>	Medium
<i>Aquila rapax</i>	Very High
<i>Gyps africanus</i>	Medium
<i>Bucorvus leadbeateri</i>	High
<i>Circus ranivorus</i>	Very Low
<i>Stephanoaetus coronatus</i>	Medium
<i>Torgos tracheliotos</i>	Low
<i>Polemaetus bellicosus</i>	Low

13.5.2 Mammalia sensitive species

Lycaon pictus primarily inhabits grasslands, savannas, open woodlands, and semi-arid to arid plains across sub-Saharan Africa, avoiding both dense forests and true deserts. It thrives in open habitats that allow long-distance pursuit hunting and support high densities of medium-sized antelope prey. Historically widespread across non-forested Africa, the species is now fragmented, with strongholds in Namibia, Botswana, Mozambique, Zimbabwe, parts of South Africa, and Tanzania, particularly in ecosystems such as the Okavango Delta and East African savannas. African wild dogs also occur in montane and coastal forests in some regions, though generally at lower densities, demonstrating some habitat flexibility but a clear preference for open, prey-rich landscapes with minimal human disturbance.

Sensitive species 5 primarily inhabits open landscapes such as grasslands, savannas, semi-arid regions, deserts, and open woodlands across sub-Saharan Africa, with a small remnant population in Iran. It favours wide, unobstructed terrain that facilitates high-speed pursuit hunting and avoids dense forests and extremely arid desert interiors. Historically widespread across Africa and parts of Asia, its range is now fragmented, with strongholds in eastern and southern Africa, including Namibia, Botswana, South Africa, Kenya, and Tanzania. Cheetahs also occur in arid and semi-arid habitats, climbing trees occasionally but remaining primarily terrestrial. Overall, the species depends on open, prey-rich ecosystems with minimal human disturbance.

Sensitive species 8 is a small forest-dwelling antelope that primarily inhabits dense, shaded habitats, including rainforests, old-growth and secondary forests, riverine forests, gallery

forests, montane forests, thickets, and coastal/scarp forests across central, eastern, and southern Africa. It strongly prefers environments with dense understory cover that provide both concealment and a steady supply of fallen fruits, leaves, flowers, and bark from the forest canopy. This species also utilises plantations and thickets near human dwellings as movement corridors, and may rest at the bases of trees or in areas with piles of deadwood for visibility and protection. Its distribution is closely tied to the availability of continuous forest habitat, making it sensitive to habitat fragmentation and degradation.

Diceros bicornis minor primarily inhabits savanna ecosystems, particularly bushveld and woodland savannas, where browse plants are abundant. Like other black rhinoceros subspecies, it is a browser that depends heavily on woody shrubs, trees, and forbs, and thus favors habitats with dense shrub cover and mixed savanna vegetation. Historically, this subspecies ranged widely from southern Tanzania through Malawi, Zambia, Zimbabwe, Mozambique, Botswana, and northern/eastern South Africa, but today persists mainly in northeastern South Africa, Namibia, and Zimbabwe, with reintroduced populations in Malawi, Botswana, and Zambia. Its habitats typically include semi-arid to sub-humid savannas, often within proximity to water sources, and it is strongly associated with thornbush, mopane woodland, and mixed acacia-dominated savannas that offer both cover and abundant browse.

Mammalia sensitive species	
<i>Lycaon pictus</i>	Very Low
Sensitive species 5	Very Low
Sensitive species 8	Very High
<i>Diceros bicornis minor</i>	Very Low

13.5.3 Reptilia sensitive species

Kinixys natalensis inhabits dry, rocky environments within thornveld, valley bushveld, dry thicket, and bushveld savanna across eastern South Africa, Eswatini, and adjacent Mozambique. It is typically found at elevations between 50 and 1,200 m, avoiding coastal regions, deep sandy substrates, and forest interiors. This species prefers microhabitats offering both cover and humidity—becoming active during overcast, humid, or post-rain conditions, and sheltering under rocks or foothills when inactive.

Crocodylus niloticus inhabits a wide range of freshwater environments, including rivers, lakes, marshes, swamps, and freshwater wetlands throughout sub-Saharan Africa, and is present in 26 countries. It is also capable of living in brackish waters such as deltas and coastal lagoons,

though it prefers fresh water. The species occurs in both eastern, southern, and central Africa, and historically occupied the full length of the Nile River. It thrives in aquatic systems with slow-moving or still water that provide suitable basking and nesting sites, and it is highly adaptable—occasionally using man-made reservoirs as habitat.

Reptilia sensitive species	
<i>Kinixys natalensis</i>	Medium
<i>Crocodylus niloticus</i>	Very Low

13.5.4 Invertebrate sensitive species

13.5.4.1 Mollusca sensitive species

Edouardia conulus (currently accepted as *Gittenedouardia conulus*) is a terrestrial land snail belonging to the family Cerastidae and occurs in South Africa, where its type locality lies. Members of this family typically occupy dry terrestrial habitats, often associated with arid or semi-arid environments, rocky ground, and soil-rich microhabitats where they take shelter under stones, leaf litter, and vegetation. Although specific habitat studies for *G. conulus* are limited, closely related *Edouardia* species are known from dry bushland, thickets, and other low-moisture terrestrial environments, suggesting similar preferences for sheltered terrestrial niches with intermittent moisture availability.

13.5.4.2 Diplopoda sensitive species

Centrobolus fulgidus is a terrestrial millipede endemic to South Africa, with its type locality recorded within the country. Although species-specific habitat notes are not published for *C. fulgidus*, millipedes of the genus *Centrobolus* are broadly associated with moist, shaded environments along the eastern coastal and sub-coastal regions of southern Africa. They typically occur in forests, coastal bush, dune thicket, and other humid microhabitats, where dense vegetation and leaf litter provide shade, high humidity, and decaying plant material for feeding. Based on this well-documented ecological pattern for *Centrobolus*, *C. fulgidus* is expected to inhabit humid forest-floor habitats, relying on leaf litter, soil moisture, and shaded cover typical of the broader genus' distribution.

Zinophora laminata is a South African millipede species recorded primarily from KwaZulu-Natal, where it inhabits sandveld forest, Acacia-dominated open grassland, and dry savanna–bushland mosaics. Specimens have been collected in Hluhluwe Game Reserve, Mkuze Game Reserve, and Umfolozi Nature Reserve, often found under rocks within sandveld

forests and open Acacia grasslands, indicating a preference for warm, semi-arid to sub-humid savanna landscapes with scattered woodland and sheltered microhabitats.

Iolaus diametra natalica is a rare, low-density subspecies restricted to KwaZulu-Natal (South Africa) and southern Mozambique, where it inhabits wooded savanna and forest habitats at low to medium elevations. It is strongly associated with structured savanna–forest mosaics that support its uncommon larval host plants, resulting in a naturally patchy distribution. Most known sub-populations occur within protected areas, and adults are seldom seen flying, as many records come from individuals reared from larvae.

13.5.4.3 Insecta sensitive species

The Grassland system has a Very Low to High SEI for the Insect species. See the table, which provides the sensitivity of each habitat type.

Deloneura millari millari, the nominotypical subspecies of Millar's Buff, occurs in Eswatini, Mozambique, and South Africa, where it inhabits coastal bush, open coastal forest, moist savanna, bushveld, sub-coastal forest, and thicket. It shows a strong ecological association with trees hosting specific coccid insects (Sternorrhyncha), on which its colonies depend, making these microhabitats essential for its persistence.

Arytropteris basalis is endemic to KwaZulu-Natal, South Africa, where it occurs exclusively in coastal forest and coastal thicket mosaics. The species inhabits dense, subtropical vegetation with a closed or semi-closed canopy, typically within leaf litter and low shrub layers that provide shelter, humidity, and food resources.

Physophorina livingstonii is strictly associated with forest habitats, where it inhabits coastal, riverine, and lowland to sub-montane forests with dense vegetation structure. It is typically found within intact forest patches, utilising the understorey and mid-storey vegetation, although its specific host plant remains unknown. The availability of continuous forest cover, stable microclimatic conditions, and minimal disturbance appears to be critical for its persistence, as the species has not been recorded in open or heavily transformed landscapes.

Pomatonota dregii is a forest-dependent katydid restricted to the Indian Ocean Coastal Belt forests of KwaZulu-Natal and the Eastern Cape in South Africa, with a probable extension into southern Mozambique. It occurs exclusively in indigenous coastal and scarp forest patches within the KwaZulu-Cape Coastal Forest Mosaic, a critically endangered vegetation type now

surviving only as small, highly fragmented remnants. The species is arboreal, feeding on a variety of tree species, especially native acacias, and forming conspicuous feeding aggregations within intact forest canopies.

Invertebrate sensitive species	
<i>Edouardia conulus</i>	High
<i>Centrobolus fulgidus</i>	High
<i>Zinophora laminata</i>	High
<i>Deloneura millari millari</i>	High
<i>Arytropteris basalis</i>	High
<i>Physophorina livingstonii</i>	High
<i>Iolais diametra natalica</i>	High
<i>Pomatonota dregii</i>	Medium

13. IMPACT ASSESSMENT AND MITIGATION

13.1 Impact statement

The proposed activity is a coal exploration project involving the drilling of ten (10) core holes distributed sparsely across the study area. These points are either located closer to roads or farther from them. The cumulative distance of paths or roads that will be required to reach these points, and about 1.09 ha of vegetation would need to be cleared to make way for equipment storage and office sites.

Direct impacts are anticipated at the drilling sites and include:

- Vegetation loss and disturbance: Clearing of vegetation for drill pads and access tracks/roads will result in the removal of indigenous tree species, including those of conservation concern.
- Soil disturbance and compaction: Drilling activities and associated vehicle movement may compact soils, reduce infiltration, alter hydrology, and impair the regeneration potential of the grassland and wetland habitats.
- Habitat fragmentation: Even sparse drilling infrastructure may cause localised fragmentation, especially as drill points are far from roads. This will therefore reduce habitat connectivity for fauna such as ground-nesting birds, small mammals, reptiles, amphibians, and invertebrates.

Indirect impacts include:

- Spread of alien invasive plant species: Disturbed soils around drill pads and access tracks may facilitate colonisation by invasive alien plants, posing long-term threats to ecosystem integrity.

- Noise and disturbance: Temporary disturbance from drilling operations may cause displacement of fauna from sensitive feeding, nesting, or breeding areas.
- Pollution risk: Accidental hydrocarbon or chemical spills, improper drilling fluid management, or poor waste handling could contaminate soils and wetlands, with significant consequences for biodiversity and water quality.

13.2 Impact Assessment Criteria

The criteria used to assess the impacts of the proposed activity on the site's vegetation are provided in Appendix B. The criteria used to determine impact consequences include the extent, intensity, and duration of the impact, as well as the probability of its occurrence. The overall significance of impacts is determined by considering consequences and probability using the rating. Finally, the impacts are considered in terms of their status (positive or negative), and the confidence in the ascribed impact significance rating is noted. The impact significance reflects the need for mitigation. While low-significance impacts may not require specific mitigation measures, high-significance negative impacts demand that adequate measures be put in place to reduce the residual significance (impact significance rating, after mitigation) (Appendix B).

13.3 Impact assessment

Table 13.1 below lists the activities and related impacts on vegetation that could take place because of the proposed activity, as well as rates the significance of the impacts without and with mitigation. The table also lists recommended mitigation measures to limit the impacts.

Table 13.1: Impact Assessment

PHASE	NAME OF ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	SIGNIFICANCE If not mitigated					MITIGATION TYPE (modify, remedy, control, or stop) through (E.g. noise control measures, storm-water control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity etc. etc) (E.g. Modify through alternative method. Control through noise control. Control through management and monitoring through rehabilitation)	SIGNIFICANCE If mitigated				
				EXTENT	INTENSITY	DURATION	PROBABILITY	RATING		EXTENT	INTENSITY	DURATION	PROBABILITY	RATING
VEGETATION														
Construction	Habitat destruction	<u>Direct impact</u> Destruction of natural vegetation on the site. <u>Status of impact</u> Negative, High	The construction of drilling points and work areas typically requires clearing vegetation, leading to the immediate loss of plant cover. This is especially concerning for rare, slow-growing, or endemic plant species that may not easily reestablish after disturbance.	1	2	3	Definite	High	Construction and maintenance activities should be carried out according to accepted environmental best practices with the minimum removal of vegetation.	1	2	2	Definite	Medium

	Soil compaction	<u>Direct impact</u> Soil compaction <u>Status of impact</u> Negative, High	The movement of heavy machinery can compact the soil, reducing its porosity and affecting root growth, water infiltration, and seedling establishment. This can be particularly detrimental to grasses and forbs adapted to loose, well-drained soils typical of grasslands.	1	2	3	Definite	Medium	Careful planning can reduce the need for extensive vegetation clearing and soil compaction, such as limiting access to existing tracks and consolidating drilling sites.	1	2	2	Possible	Low
	Soil erosion	<u>Direct impact</u> Exposure of soils to erosion <u>Indirect impacts:</u> Subsequent sedimentation of the natural vegetation and wetland. <u>Status of impact:</u> Negative, High	Removal of vegetation will lead to soil erosion, especially as the site is susceptible to erosion.	1	2	3	Definite	Medium	- Protect all areas susceptible to erosion and ensure that there is no undue soil erosion resulting from activities within and adjacent to the road. - Do not allow erosion to develop on a large scale before acting. - Remove only the vegetation where essential for construction and do not allow any disturbance to the adjoining natural vegetation cover.	1	2	2	Possible	Low
Construction/ Operations	Construction/ Operations	<u>Direct impact</u> Spread of alien and native invasive plant species	Seeds and parts of alien invasive plant species that occur on-site will spread into the	2	2	3	Definite	High	Alien invasive species, especially category 1b invaders identified should be removed to prevent the spread of these species.	1	2	2	Probable	Low

		<u>Status of impact</u> Negative, High	areas where they didn't invade. Construction vehicles and equipment used on various other sites could introduce alien invasive plant seeds or indigenous plants not belonging to this site.						• All alien seedlings and saplings must be removed as they become evident for the duration of construction and operation. • All construction and operation vehicles and equipment and vehicles should be thoroughly cleaned before accessing the construction areas. • If soil, sand or other natural materials for building are required and brought onto site, the stored heaps should be monitored for the growth and germination and alien species and should be regularly cleared during construction.					
Construction and operation	Construction and operation	<u>Indirect impacts:</u> Pollution of soil and soil water <u>Indirect impact:</u> deterioration of vegetation <u>Cumulative impact:</u> Pollution of soil water in the area <u>Status of impact</u> Negative, High	Spillages of construction material and harmful chemicals. Illegal disposal and dumping of construction materials such as cement or oil, as well as maintenance materials during construction and operation.	1	3	2	possible	Medium	• Prevent spillage of material, oils or other chemicals, strictly prohibit other pollution. Ensure there is a method statement in place to remedy any accidental spillages immediately. • Trucks and equipment should only be washed in dedicated areas and the dirty water is not allowed to discharge into the surrounding natural vegetation.	1	1	2	Improbable	Very Low

Operational	Rehabilitation	<u>Direct impacts:</u> Failed rehabilitation. <u>Indirect impact:</u> Results in vegetation with a low basal cover, prone to erosion and invasion by exotic and invasive plant species. <u>Cumulative impacts:</u> Erosion and donga formation. Status of impact: Negative, medium	Lack of adequate rehabilitation of soils and vegetation	1	2	3	Probable	Medium	- Continuous monitoring of revegetated sites. - Continuous monitoring to determine possible soil erosion especially as this area has highly erodible soils. - Revegetate with other local vegetation, especially locally growing creeping grass.	1	1	2	Probable	Very Low

TERRESTRIAL ANIMALS														
PHASE	NAME OF ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	SIGNIFICANCE If not mitigated					MITIGATION TYPE (modify, remedy, control, or stop) through (E.g. noise control measures, storm-water control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity etc. etc) (E.g. Modify through alternative method. Control through noise control. Control through management and monitoring through rehabilitation)	SIGNIFICANCE If mitigated				
				EXTENT	INTENSITY	DURATION	PROBABILITY	RATING		EXTENT	INTENSITY	DURATION	PROBABILITY	RATING

Construction	Clearing of vegetation	<u>Direct impact</u> Destruction of natural vegetation on the site <u>Status of impact</u> Negative, Medium	Drilling sites often require clearing vegetation, which removes the cover and food resources. Individual species or breeding pairs that nest or forage on the ground, like larks and pipits, may experience direct habitat And killing of terrestrial and fossorial small mammals and herpetofauna in the prospecting footprint, vehicle/machinery traffic and trampling by workers may occur.	1	2	2	Definite	Low	- Drilling and maintenance activities should be carried out according to accepted environmental best practices with the minimum removal of vegetation. - The area must be rehabilitated immediately after prospection on each borehole. - If vegetation will be severely damaged along the borehole access route, rehabilitation has to be carried out.	1	2	1	Definite	Very Low
	Off-road driving	<u>Direct impact</u> Soil compaction, mechanical noise and destruction of possible underground habitat habitats.	The movement of heavy machinery across natural vegetation type will likely destroy underground tunnels and nests	1	2	2	Definite	Low	- Only use existing roads. - Vehicular movement should be restricted within the proposed site.	1	1	2	Probable	Very Low

		<u>Status of impact:</u> Negative, High	of rodents and other fossorial species. While vibrations and noise from vehicles and drilling activities could drive animals and birds away from the site											
Operational	Rehabilitation	<u>Direct impacts:</u> Failed rehabilitation. Introduction of invasive alien species and habitat transformation. <u>Indirect impact:</u> Results in vegetation with a low basal cover, prone to erosion and invasion by exotic and invasive plant species. <u>Cumulative impacts:</u> Erosion and donga formation on steep areas. <u>Status of impact:</u> Negative, Medium	Lack of adequate rehabilitation of soils and vegetation. Introduction and facilitation in spread of invasive plant species will transform the vegetation composition and cover. Therefore, changing nesting and forage material.	1	2	3	Probable	Medium	• Monitoring of revegetated sites. • Monitoring to determine possible soil erosion. • Revegetate with other local vegetation, especially creeping grass. • Clean vehicles coming from other areas to reduce or prevent the possibility of foreign plant parts and propagules to be introduced in the new site.	1	1	2	Probable	Very Low

14. CONCLUSION AND RECOMMENDATIONS

The proposed coal prospecting activity is set to take place within the Zululand Lowveld and Northern Zululand Sourveld ecosystems, which are classified as Vulnerable. However, the site has more characteristics of the former. Given the ecological sensitivity, careful planning and mitigation measures are essential to minimise potential impacts.

This site's KBA designation, combined with the area's status as a Critical Biodiversity Area (CBA) and part of a National Protected Area Expansion Strategy (NPAES) Priority Focus Area, indicates that the landscape holds very high biodiversity sensitivity and conservation importance. The project must therefore demonstrate compliance with the mitigation hierarchy, prioritising avoidance, followed by minimisation and rehabilitation to ensure no net loss of biodiversity. While the proposed prospecting activity involves only 10 small core drilling points (total footprint ± 0.012 ha), the fact that the entire prospecting right area lies within a KBA necessitates a precautionary and strictly controlled approach

Although the activity is considered less invasive compared to large-scale mining, it is discouraged in areas that are intact and far away from the road. This is due to the ecological importance, threatened status, and limited resilience to anthropogenic disturbance of this type of vegetation. The loss or alteration of intact habitats in such ecosystems represents a potentially irreversible biodiversity impact. Therefore, prospecting should be conducted in areas close to the road and where tree vegetation won't be cleared.

Overall, the prospecting activity is expected to have a medium to high ecological impact significance before mitigation, given its location within sensitive and threatened ecosystem types. With stringent mitigation measures, such as minimising the development footprint, avoiding intact areas, enforcing alien invasive plant control, implementing strict spill prevention protocols, and rehabilitating disturbed sites, the impact significance may be reduced to low to medium. However, the residual risk remains notable because of the conservation status of this vegetation type. Further mitigation strategies include the following:

- **Pre-construction walk-over:** A walk-through of the borehole and campsite must be undertaken by an appropriately qualified and competent person (ecologist) prior to construction to ensure that there are no species of conservation concern (flora or fauna) that require removal/relocation with the appropriate permitting.
- **Avoid Sensitive Habitats:** All termitaria and mole mounds should be left undisturbed to preserve soil stability and biodiversity. Furthermore, steep areas should be avoided as these areas are susceptible to soil erosion.

- Optimise Drill Point Locations: Where possible, drill points located far from existing roads should be relocated closer to road networks to prevent unnecessary trampling and disturbance of intact grassland vegetation.
- Implement Strict Site Access Control: Restrict movement of personnel and equipment to designated pathways to reduce habitat fragmentation and prevent the unnecessary clearing of vegetation.
- Rehabilitation Plan: Upon completion of the prospecting activities, rehabilitation of disturbed areas should be undertaken to restore natural vegetation and prevent soil erosion.

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APPENDIX A: VEGETATION SENSITIVITY EVALUATION

The following criteria and weighting was used to determine the vegetation sensitivity, function and conservation importance:

The status of the regional vegetation that is expected to occur on the study site, only where natural vegetation is still remaining.	
Conservation status*	Scoring
Critically Endangered	3
Endangered	2
Vulnerable	1
Least threatened	0

*This scoring is not applicable (N/A) for areas devoid of natural vegetation.

Predominant state or condition of the vegetation	
Vegetation condition	Scoring
Primary state	3
Sub-climax state	2
Secondary state	1
No natural vegetation remaining	0

Reversibility of degradation, ability to rehabilitate	
Ability to rehabilitate	Scoring
Irreversible or very difficult to attain	3
Partially reversible, will require relevant mitigation effort and management, as well as rehabilitation structures e.g. gabions	2
Reversible by active rehabilitation and revegetation	1
Resilient, vegetation can be rehabilitated well by natural agents given the rehabilitation of landscapes	0

The presence of suitable habitats for plants is of conservation concern as well as the actual occurrence thereof	
Suitable habitat/presence	Scoring
Confirmed presence of red-listed species (Threatened)	3
Confirmed presence of Orange listed (Near threatened, Declining), and Suitable habitat and some likelihood of occurrence of Threatened species	2
Suitable habitat but unlikely to occur	1
No suitable habitat	0

APPENDIX B: SITE ECOLOGICAL IMPORTANCE

Table 1: Ecological Function: areas important to ecological processes such as ecological corridors, hydrological processes and important topographical features such as ridges.

Ecological function	Scoring
High: Sensitive vegetation communities with low inherent resistance or resilience towards disturbance factors; vegetation that are considered important for the maintenance of ecosystem integrity. Most of these vegetation communities represent late succession ecosystems with high connectivity with other important ecological systems.	3
Medium to high: Vegetation communities that occur at disturbances of low-medium intensity and representative of secondary succession stages with a high degree of connectivity with other ecological systems OR disturbed vegetation connected to an ecological and protected system e.g. ridge, wetland or river	2
Medium: Vegetation communities that occur at disturbances of low-medium intensity and representative of secondary succession stages with some degree or limited connectivity with other ecological systems	1
Low: Degraded and highly disturbed vegetation with little ecological function	0

Table 2: Conservation Importance Criteria

Conservation Importance	Fulfilling Criteria
Very High	Confirmed or highly likely occurrence of CR, EN, VU or Extremely Rare¹⁵ or Critically Rare¹⁶ species that have a global Extent of Occurrence of < 10 km². Any area of natural habitat¹⁷ of a CR ecosystem type or large area (> 0.1 % of the total ecosystem type extent¹⁸) of natural habitat of EN ecosystem type. Globally significant populations of congregatory species (>10% of global population).
High	Confirmed or highly likely occurrence of CR, EN, VU species that have a global Extent of Occurrence of > 10 km². IUCN threatened species (CR, EN, VU) must be listed under any criterion other than A. If listed as threatened only under Criterion A, include if there are less than 10 locations or < 10 000 mature individuals remaining. Small area (>0.01% but < 0.1 % of the total ecosystem type extent) of natural habitat of EN ecosystem type or large area (> 0.1 %) of natural habitat of VU ecosystem type. Presence of Rare species. Globally significant populations of congregatory species (>1% but <10% of global population).
Medium	Confirmed or highly likely occurrence of populations of NT species, threatened species (CR, EN, VU) listed under A criterion only and which have more than 10 locations or more than 10 000 mature individuals. Any area of the natural habitat of threatened ecosystem type with a status of VU Presence of range-restricted species > 50 % of receptor contains natural habitat with potential to support SCC
Low	No confirmed or highly likely populations of Species of Conservation Concern No confirmed or highly likely populations of range-restricted species < 50 % of receptor contain natural habitat with limited potential to support SCC
Very Low	No confirmed and highly unlikely populations of SCC

	No confirmed and highly unlikely populations of range-restricted species No natural habitat remaining

1. Functional Integrity (FI)

- a. Connectivity to other natural areas - connectivity, which can also be measured conversely as the degree of habitat fragmentation, refers to how connected habitat patches are to each other, which has a significant influence on numerous ecological process, such as migration and dispersal opportunities of biota and therefore genetic exchange between populations. Connectivity to other similar habitats becomes more important as the remaining intact and functional area of a habitat decreases, mainly because population sizes decrease and are therefore at greater risk from ecological perturbations and inbreeding effects. The degree of connectivity between habitat patches varies greatly with the dispersal ability of the taxon or taxon group (e.g. fossorial reptiles) in question;
- b. Degree of current persistent negative ecological impacts¹⁹ - persistent negative impacts such as uncontrolled spread of alien and invasive flora effectively decreases both the remaining intact area and ecosystem functioning of a particular habitat; and
- c. Remaining intact and functional area – the proportion of the receptor that supports natural habitat with intact ecological processes - small areas are less likely to withstand ecological degradation compared to large areas and are therefore better able to maintain structure and function allowing for intact ecological processes.

Table 3: Functional Integrity Criteria

Conservation Importance	Fulfilling Criteria
Very High	Very large (>100 ha) intact area for any conservation status of ecosystem type or >5 ha for CR ecosystem types. High habitat connectivity serving as functional ecological corridors, limited road network between intact habitat patches. No or minimal current negative ecological impacts with no signs of major past disturbance (e.g. ploughing).
High	Large (>20 ha but <100 ha) intact area for any conservation status of ecosystem type or >10 ha for EN ecosystem types. Good habitat connectivity with potentially functional ecological corridors and a regularly used road network between intact habitat patches. Only minor current negative ecological impacts (e.g. few livestock utilising area) with no signs of major past disturbance (e.g. ploughing) and good rehabilitation potential.
Medium	Medium (>5 ha but <20 ha) semi-intact area for any conservation status of ecosystem type or > 20 ha for VU ecosystem types. Only narrow corridors of good habitat connectivity or larger areas of poor habitat connectivity and a busy used road network between intact habitat patches. Mostly minor current negative ecological impacts with some major impacts (e.g. established population of alien and invasive flora) and a few signs of minor past disturbance; moderate rehabilitation potential.
Low	Small (>1 ha but <5 ha) area. Almost no habitat connectivity but migrations still possible across some transformed or degraded natural habitat and a very busy used road network surrounds the area. Low rehabilitation potential. Several minor and major current negative ecological impacts.
Very Low	Very small (<1 ha) area.

	No habitat connectivity except for flying species or flora with wind-dispersed seeds. Several major current negative ecological impacts

Table 4: Biodiversity Importance Matrix

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

Receptor Resilience (RR)

Table 5: Resilience Criteria

Resilience	Fulfilling Criteria
Very High	Habitat that can recover rapidly (~ less than 5 years) to restore > 70 % of the original species composition and functionality of the receptor functionality, or species that have a very high likelihood of remaining at a site even when a disturbance or impact is occurring, or species that have a very high likelihood of returning to a site once the disturbance or impact has been removed.
High	Habitat that can recover relatively quickly (~ 5-10 years) to restore > 70 % of the original species composition and functionality of the receptor functionality, or species that have a high likelihood of remaining at a site even when a disturbance or impact is occurring, or species that have a high likelihood of returning to a site once the disturbance or impact has been removed.
Medium	Will recover slowly (~more than 10 years) to restore > 70 % of the original species composition and functionality of the receptor functionality, or species that have a moderate likelihood of remaining at a site even when a disturbance or impact is occurring, or species that have a moderate likelihood of returning to a site once the disturbance or impact has been removed.
Low	Habitat that is unlikely to be able to recover fully after a relatively long period: > 15 years required to restore ~less than 50 % of the original species composition and functionality of the receptor functionality, or species that have a low likelihood of remaining at a site even when a disturbance or impact is occurring, or species that have a low likelihood of returning to a site once the disturbance or impact has been removed.
Very Low	Habitat that is unable to recover from major impacts, or species that are unlikely to remain at a site even when a disturbance or impact is occurring, or species that are unlikely to return to a site once the disturbance or impact has been removed.

Table 6: Site Ecological Importance Matrix

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

Table 7: Guidelines for interpreting Site Ecological Importance (SEI) in the context of the 815 *proposed development activities*.

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

APPENDIX C: IMPACT ASSESSMENT CRITERIA

Table 1: Criteria used to determine the consequence of the impact

RATING	DEFINING OF RATING	SCORE
A. EXTENT – THE AREAS IN WHICH THE IMPACT WILL BE EXPERIENCED		
Local	Confined to the project or site if study area or part therefore (e.g)	1
Regional	The region, which may be defined in various ways, e.g. cadastral, catchment, topographic	2
Inter(national)	National or beyond	3
B. INTENSITY – THE MAGNITUDE OR SIZE OF THE IMPACT		
Low	Site-specific and wider natural and/or social functions and processes continue albeit in a modified way	1
Medium	Site-specific and wider natural and/or social functions and processes continue albeit modified way	2
High	Site-specific and wider natural and/or social functions or processes are severely altered	3
C. DURATION – THE TIME FRAME FOR WHICH THE IMPACT WILL BE EXPERIENCED		
Short-term	For the duration of project activities/up to 2 years	1
Medium-term	2 to 15 years	2
Long-term	More than 15 years	3

The combined score of these three criteria corresponds to a consequence rating, as set out in Table 2 (Note that the lowest possible consequence score is 3).

Table 2: Method used to determine the consequence score

Combined Score (A+B+C)	3 – 4	5	6	7	8 – 9
Consequence Rating	Very Low	Low	Medium	High	Very High

Once the consequence is derived, the probability of the impact occurring is considered, using the probability classification presented in Table 3.

Table 3: Probability classification

Probability of impact – the likelihood of the impact occurring	
Improbable	<40% chance of occurring
Possible	40% - 70% chance of occurring
Probable	>70% - 90% chance of occurring
Define	>90% chance of occurring

The overall significance of impacts is determined by considering consequence and probability using the rating system prescribed in Table 4

Table 4: Impact significance ratings

Probability

		Improbable	Possible	Probable	Definite
Consequence	Very Low	INSIGNIFICANT	INSIFICANT	VERY LOW	VERY LOW
	Low	VERY LOW	VERY LOW	LOW	LOW
	Medium	LOW	LOW	MEDIUM	MEDIUM
	High	MEDIUM	MEDIUM	HIGH	HIGH
	Very High	HIGH	HIGH	VERY HIGH	VERY HIGH

Finally, the impacts are considered in terms of their status (positive or negative) and the confidence in the ascribed impact significance rating is note. The classification for considering the status of impacts and the confidence in assessment is laid out in Table 5

Table 5: Impact Status and Confidence

Status of Impact	
Indication whether the impact is adverse (negative) or beneficial (positive)	+ ve (positive – a ‘benefit’)
	-ve (negative – a ‘cost’)
	Neutral
The degree of confidence in prediction based on available information, the environmental consultant’s judgement and/or specialist knowledge	Low
	Medium
	High

Different types of impacts were also considered in the impact ratings, as listed in Table 6

Table 6: Types of Impacts

Direct – impacts that result from the direct interaction between a project activity and the receiving environment (e.g. dust generation which affects air quality).
Indirect – impacts that result from other (non-project) activities but which are facilitated as a result of the project or impacts that occur as a result of subsequent interaction of direct project impacts within the environment (e.g. reduced water supply that affects crop production and subsequently impacts on subsistence-based livelihoods).
Cumulative – impacts that act together with current or future potential impacts of other activities or proposed activities in the area/region affect the same resources and/or receptors (e.g. combined effects of waste water resource, which may be acceptable individually, but cumulatively result in water quality)

There is no statutory definition of ‘significance’ and its determination is therefore necessarily partially subjective. Criteria for assessing the significance of impacts arise from the following key elements.

Status of compliance with relevant local legislation, policies and plans, any relevant or industry policies, environmental standards or guidelines and internationally accepted best practice:

- The consequence of the change to the biophysical or socio-economic environment (e.g. loss of habitats, decrease in water quality) expressed, wherever expressed, in quantitative terms. For socio-economic impacts, the consequence must be viewed from the perspective of those affected, by taking into account the likely perceived importance of the impact and the ability of people to manage and adapt to the change.
- The nature of the impact receptor (physical, biological, or human). Where the receptor is physical (e.g. water resource) its quality, sensitivity to change and importance must be considered. Where the receptor is biological, its importance (e.g. its local, regional, national or international importance) and its sensitivity to the

impact must be considered. For a human receptor, the sensitivity of the household, community or wider societal group must be considered along with their ability to adapt to and manage the effects of the impact; and

- The probability that the identified impact will occur. This is estimated based upon experience and/or evidence that such an outcome has previously occurred.

The impact significance rating also reflects the need for mitigation. While low significance impacts may not require specific mitigation measures, high significance negative impacts demand that adequate measures be put in place, to reduce the residual significance (impact significance rating, after mitigation), as described below in Table 7.

Table 7: Definitions of impact significance

Insignificance – the potential impact is negligible and no mitigation measures or environmental management is required.
Very low & low: no specific mitigation measures required, beyond normal environmental good practices.
Medium – high: specific mitigation measures should be devised, to reduce the impact significance to an acceptable level. If mitigation is not possible, compensation measures should be considered.
Very high: specific mitigation measures should be identified and implemented, to reduce the impact significance to an acceptable level. If such mitigation is not possible, very high significance negative impacts should be considered in the project's authorisation process.

Note that impact significance will be rated in the prescribed way both without and with the effective implementation of the recommended mitigation measures.

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COMPETENCIES AND SKILLS			
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DATE OF BIRTH	03/03/1986	NATIONALITY	South African

EDUCATION			
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EMPLOYMENT RECORD			
Employer	Position	From/to	Duration
Durban University of Technology	Academic lecturer	01 June 2020 to till present	3.6 years
Employer	Position	From/to	Duration

Damelin College	Academic lecturer	01 July 2017 to 30 May 2020	2.11 years

Employer	Position	From/to	Duration
Durban University of Technology	Work Integrated Learning Coordinator	01 March 2017 to 30 May 2017	3 months

Employer	Position	From/to	Duration
Durban University of Technology	Academic lecturer	01 July 2015 to 31 December 2016	17 months

Employer	Position	From/to	Duration
Damelin College	Academic lecturer	01 July 2014 to 30 June 2015	12 months

Employer	Position	From/to	Duration
Isibani Academy	Teacher	06 January 2014 to 30 June 2014	5 months

Employer	Position	From/to	Duration
Addo Elephant National Park	Research Assistant intern	01 January 2012 to 31 December 2012	12 months

Employer	Position	From/to	Duration
Dr Corli Coatsee (Nelson Mandela University/National Research Fund)	Research Assistant	01 March 2013 – 31 December 2013 01 March 2011 – 31 December 2011	20 months

PROJECT EXPERIENCE (2019 to date)

2019: Aggregate mining permit application at Rietvlei, Mzimkhulu, KwaZulu Natal

2019: Sand Mining Application in Gonubie, East London, Eastern Cape

2020: Biodiversity Assessment for Water Treatment Plant Upgrade in Bergville, KwaZulu Natal

2020: Biodiversity Assessment For The Proposed Quarry Mining At Indwedwe (And Kwadukuza) Municipalities In The Ilembe District Municipality, Kwazulu Natal

2021: Vegetation Assessment for the Esephezi Road Upgrade Project at Eshowe, in Umlalazi Local Municipality, KwaZulu Natal

2021: Animal Assessment For The Prospecting Right Application At On Portion 1 And 2 Of The Farm Simdlangentha (16956 Hu) And Bongaspoort (16930) In Kwazulu Natal

2022: Biodiversity Assessment for Sokhela Road Upgrade Project At Nyavini, In Umzumbe Local Municipality, KwaZulu Natal

2022: Biodiversity Assessment for The Proposed Mining At Thornridge (Uitkomst And Doornrug (Thornridge) Farm No. 852 Situated) In Cato Ridge, eThekwini Metropolitan Municipality, KwaZulu Natal

2022: Biodiversity Assessment for The Upgrade Of The Water Treatment Works And Reticulation System Of Colenso/Roosboom, KwaZulu Natal

2022: Mapping of ecosystems of Bushbuckridge Local Municipality.

2023: The Assessment of the Presence and Condition of *Adansonia digitata* at Sterkspuit Aggregates (Pty) Ltd, Cliffdale

2023: The Assessment of the extent of the natural forest and the associated indigenous trees at Sterkspruit Aggregates (Pty) Ltd, Cliffdale

2023: Assessing the Presence and Distribution of *Sclerocarya birrea* subsp. *caffra* at Sterkspruit Aggregates (Pty) Ltd, Cliffdale

ENVIRONMENTAL EMERGENCY PREPAREDNESS, RESPONSE AND CONTINGENCY PLAN FOR THE PROSPECTING RIGHT APPLICATION ON LOT 289 EMPANGENI 13389 GU AND LOT 285 EMPANGENI 13400 GU

Document Number: HG01-00-GEN-2026.01.27-r1-REP-VAH118

Prepared By:

Hunts Green Consulting (Pty) Ltd

Prepared For:

Vahlengwe Mining Advisory and Consulting (Pty) Ltd

Attention To:

Lusizo Nqasha

Date:

MARCH 2026

Hunts Green Consultants (Pty) Ltd

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HUNTS GREEN

**ENVIRONMENTAL EMERGENCY PREPAREDNESS, RESPONSE AND
CONTINGENCY PLAN FOR THE PROSPECTING RIGHT APPLICATION
ON LOT 289 EMPANGENI 13389 GU AND LOT 285 EMPANGENI 13400
GU**

MARCH 2026

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LIST OF ACRONYMS AND ABBRIVEATIONS

COSHH	Control of Substances Hazardous to Health
DWS	Department of Water and Sanitation
EA	Environmental Authorisation
EMP	Environmental Management Plan
EMS	Environmental Management System
HDPE	High-Density Polyethylene
IWWMP	Integrated Water and Waste Management Plan
MSDS	Material Safety Data Sheets
Mtpa	Million Tonnes per annum
NEMA	National Environmental Management Act, 1998 (Act No. 107 of 1998)
NWA	National Water Act, 1998 (Act No. 36 of 1998)
PCD	Pollution Control Dam
PPE	Personal Protective Equipment
TFR	Transnet Freight Rail
uPVC	Unplasticized Polyvinyl Chloride
WULA	Water Use Licence Application



1. Purpose of the Plan

This Contingency Plan outlines the procedures, responsibilities, and emergency actions required to prevent, contain, and remediate pollution incidents associated with prospecting activities. It ensures compliance with:

- **Section 19 of the National Water Act** (duty of care to prevent pollution)
- **Regulation 704** (protection of water resources during mining)
- **Section 28 of NEMA** (duty of care and remediation of environmental damage)

The plan applies to all personnel, contractors, and visitors operating within the designated 1.41 ha infrastructure footprint.

1.1. Scope and Applicability of Plan

This plan covers all potential pollution sources associated with the project:

- Hydrocarbon storage and handling
- Machinery leaks and refuelling
- Contaminated stormwater runoff
- Wastewater from ablutions
- Solid and hazardous waste
- Drilling fluids and cuttings
- Accidental fires
- Vehicle accidents involving hazardous materials

This Plan is applicable to all the proposed Project activities that will be undertaken by Vahlengwe Mining Advisory and Consulting, including contractors and subcontractors.

The Environmental Emergency Preparedness Contingency Plan provides a structured approach to mitigate and respond to incidents at the Project area that could adversely impact personnel, public health or the biophysical environment. The Contractor will also be required to compile a Method Statement that deals specifically with emergencies. This Environmental Emergency Preparedness and Response Plan sets out the approach that Vahlengwe Mining Advisory and Consulting will adopt in relation to pollution prevention measures and environmental incident management.

Vahlengwe Mining Advisory and Consulting will develop and implement appropriate measures to control the risk of pollution due to project activities, materials and extreme weather events.

The plan will define the criteria for implementing the relevant measures. This plan is written on the basis that Vahlengwe Mining Advisory and Consulting can undertake their business in the normal manner. The Emergency Preparedness and Response Plan shall be reviewed every 6 months or following an emergency or incident. Post-incident reports should be compiled to assess the effectiveness of the response and identify areas for improvement.

Where significant disruption occurs that fundamentally affects the implementation of this Plan (e.g. health pandemic), an addendum will be prepared to describe how the requirements of this document shall be modified for the duration of the disruption.

1.2. Objectives and Strategy

The following objectives have been identified for emergency and preparedness response on this project:

- Ensure the protection of the environment from pollution related incidents and to ensure compliance with the DWS guidelines and associated regulations and any licence and consent conditions.
- Outline the training for staff involved in water management and emergency response to ensure they are prepared for potential contamination events; and
- Conservation of Water Resources: Minimize water usage and ensure proper treatment of water used in mining operations to avoid contamination of local water bodies and ecosystems.

2. Legal Framework

The following legislation needs to be adhered to in terms of managing emergencies at the Vahlengwe Mining Advisory and Consulting.

Table 2-1: Relevant Legislation

Applicable Legislation, Regulation or Guideline	Applicability
<u>National Environmental Management Act, 1998 (Act No. 107 of 1998)</u> The NEMA, as amended was set in place in accordance with Section 24 of the Constitution. Certain environmental principles under NEMA must be adhered to, to inform decision making for issues affecting the environment. Section 24 (1)(a) and (b) of NEMA state that: <i>The potential impact on the environment and socio-economic conditions of activities that require authorisation or permission by law, and which may significantly affect the environment, must be considered, investigated, and assessed prior to their implementation and reported to the organ of state charged by law with authorising, permitting, or otherwise allowing the implementation of an activity.</i>	The Plan has been developed with the NEMA principles in mind.
<u>National Environmental Management: Waste Act No. 59 of 2008 (NEM: WA) National Environmental Management: Waste Act No. 59 of 2008 (NEM: WA)</u> NEM: WA regulates waste management in South Africa and provides reasonable measures for pollution prevention resulting from waste activities.	The construction and operational phase of the Vahlengwe Mining Advisory and Consulting will result in the generation of waste (hazardous and non-hazardous).



Applicable Legislation, Regulation or Guideline	Applicability
<u>National Water Act, 1998 (Act No. 36 of 1998) (NWA)</u> The NWA provides for the sustainable and equitable use and protection of water resources. It is founded on the principle that the National Government has overall responsibility for and authority over water resource management, including the equitable allocation and beneficial use of water in the public interest, and that a person can only be entitled to use water if the use is permissible under the NWA	The proposed and existing activities will potentially trigger the following water uses in terms of National Water Act, Act 36 of 1998; • Section 21 (a) • Section 21 (c) • Section 21 (i) • Section 21 (g).
<u>Disaster Management Act (Act No. 57 of 2002)</u> The Disaster Management Act (Act No. 57 of 2002) aims to establish a comprehensive framework for disaster risk management and response across the country. The objectives of the Act are primarily focused on reducing the risks and impacts of disasters while ensuring coordinated and effective management when they occur.	The construction and operational phases of the Project have the inherent potential for environmental risk and incidents.
<u>Occupational Health and Safety Act (Act No. 85 of 1993)</u> The Occupational Health and Safety Act (Act No. 85 of 1993) of South aims to ensure the health, safety, and welfare of employees in the workplace. It establishes a legal framework for preventing workplace injuries, illnesses, and accidents by setting out responsibilities for employers, employees, and other parties involved.	The construction and operational phases of the Project have the inherent potential for environmental and workplace risk and incidents.



3. Responsibilities

Vahlangwe Mining Advisory and Consulting has the responsibility to provide emergency response services and to structure and coordinate emergency response procedures and ensure that specific emergency responsibilities allocated are organised and undertaken. Further to that, Vahlangwe Mining Advisory and Consulting must ensure that employees and contractors are trained and aware of all required emergency procedures.

Emergency response personnel must develop the specific response strategies for individual scenarios, whilst relying on the measures described in this Plan.

Table 2: Roles and Responsibilities

Role	Main Responsibilities
Exploration Manager	- Overall responsibility for adherence to this Plan; - Site Specific Emergency Preparedness & Response Plans and Catastrophic/Major Incidents; - Business Continuity; - Legal compliance during the delivery of the Vahlangwe Mining Advisory and Consulting Project; - Manage response to above environmental incident and Overall coordination, liaison with external agencies.
EHSE Manager	Ensure Pollution Control Plan and Site-Specific Emergency Preparedness & Response Plan Templates are updated. - Implement the Environmental Management System (EMS) and Environmental Management Plan (EMP); - Ensure environmental issues are discussed and communicated effectively on site; - Identifying and managing any environmental risks;



	■ Providing an input into the construction methodology to ensure that any environmental requirements are met; ■ Ensuring pollution controls and incident processes are implemented throughout the construction activities; ■ Review and approval of Risk Assessment Method Statements; ■ Develop and provide environmental training; ■ Arrange environmental emergency response drills; ■ Ensuring pollution prevention measures are inspected regularly; ■ Ensuring compliance with any conditions specified in environmental authorisations are monitored; ■ Ensure compliance with environmental legislation and contractual requirements onsite; ■ Review and update site specific emergency preparedness and response plans; ■ Support response to environmental incidents, including catastrophic events; and ■ Ensuring lessons learned are produced and distributed, and lessons learned received from other areas are communicated to the site team.
Site Manager	Responsible for: ■ Ensuring pollution prevention measures are in place on site, and well maintained and inspected. ■ Undertaking remedial works to the mitigation measures as directed by the Environment Manager or Construction Manager;



	■ Ensuring Maintenance Teams are in place and undertaking the works allocated; and ■ Ensuring sufficient plant and labour resources are available to uphold pollution prevention measures.
Project Engineers / Drilling Manager	Responsible for: ■ Planning construction activities in accordance with best practice and pollution mitigation techniques; ■ Inclusion of mitigation measures within Method Statements; and ■ Inspections of storage areas, water courses/drainage and plant during the Project operational phase.
Maintenance Team	■ Inspection of pollution control measures within their allocated area; and ■ Undertaking maintenance works as required.
All Personnel	■ Responsible for complying with this plan and reporting incidents, near misses, faulty equipment or damage to the environment to Project Management or Supervisors. ■ All personnel are responsible for ensuring that their works are carried out in a manner that does not pollute the local environment.



4. Project Description

The proposed Prospecting Right (PR) project, to be undertaken by Molobedu Makoweni (Pty) Ltd, to excavate and prospect for coal value, in respect of Lot 289 Empangeni 13389 GU, and Lot 285 Empangeni 13400 GU, located within the King Cetshwayo District Municipality, KZN Province. The project seeks to establish regulated coal extraction operations on approximately 1518 hectares. The site supports regional construction and infrastructure needs through sustainable extraction of coal.

The project requires environmental authorization in terms of the National Environmental Management Act (NEMA, 1998) and a prospecting right under Section 16 of the Mineral and Petroleum Resources Development Act (MPRDA, 2002). Several other legislative frameworks apply, including the National Water Act, the National Environmental Management: Biodiversity Act, and the National Environmental Management: Air Quality Act. The project is designed to operate within the framework of South Africa's environmental legislation, including the National Environmental Management Act (NEMA). It is subject to a Basic Assessment (BA) process as prescribed by the Environmental Impact Assessment (EIA) Regulations. Thus, prospecting activities will be conducted using mechanised equipment, primarily drill rigs, to ensure efficient and controlled resource recovery.

Molobedu Makoweni (Pty) Ltd will demonstrate its commitment to responsible mining practices and environmental stewardship while contributing to the economic development of the region. Vahlengwe Mining Advisory and Consulting (Pty) Ltd, hereafter "Vahlengwe", has been appointed by Molobedu Makoweni (Pty) Ltd as the independent Environmental Assessment Practitioner (EAP) to facilitate the Environmental Authorisation for the prospecting right application for exploring coal value.

The PR area applied for covers an area of approximately 1,158.0 ha, where the applicant intends to use drill rigs to extract coal core samples. The main objective of core drilling is to collect core samples, which is used to check the mineral content and the quality of the rock. Core drilling is a rotary cutting drilling method consisting of a ring-shaped drill bit armed with cutting tools, which is forced into the rock surface and rotated clockwise at a high speed. A core sample is cut out of the rock for analysis. Drilling a coal sample for coal exploration typically takes a few hours to a few days per hole, depending on the depth, geological conditions, core recovery method and drilling speed. It is anticipated that the exploration will take 5 years, with the possibility of an extension of 3 years.

Drilling the individual cores disturbs a small footprint per drill pad, does not involve large scale excavation, the activity is temporary and short in duration, therefore, there is no significant hydrological risk. However, the supporting activities may cause surface water risks, such as hydrocarbon spills, contaminated runoff from storage areas, poor waste handling and machinery leaks. Vahlangwe has commissioned a separate pollution prevention contingency plan to manage these identified risks. This hydrological report focuses on the portion of the application area (~5.30 ha) designated for the construction of infrastructure and other project-related activities, rather than the entire application area.



To undertake this mining activity, the following infrastructure is required, which includes (Figure 4-1):

- Administration mobile offices;
- Ablution facilities;
- Packing bay for machineries;
- Packing for staff and visitors;
- Bunded walls to store chemicals like diesel or fuel;
- Waste bins; and
- Equipment such as the excavators, front-end loaders, water tankers, and dump trucks.

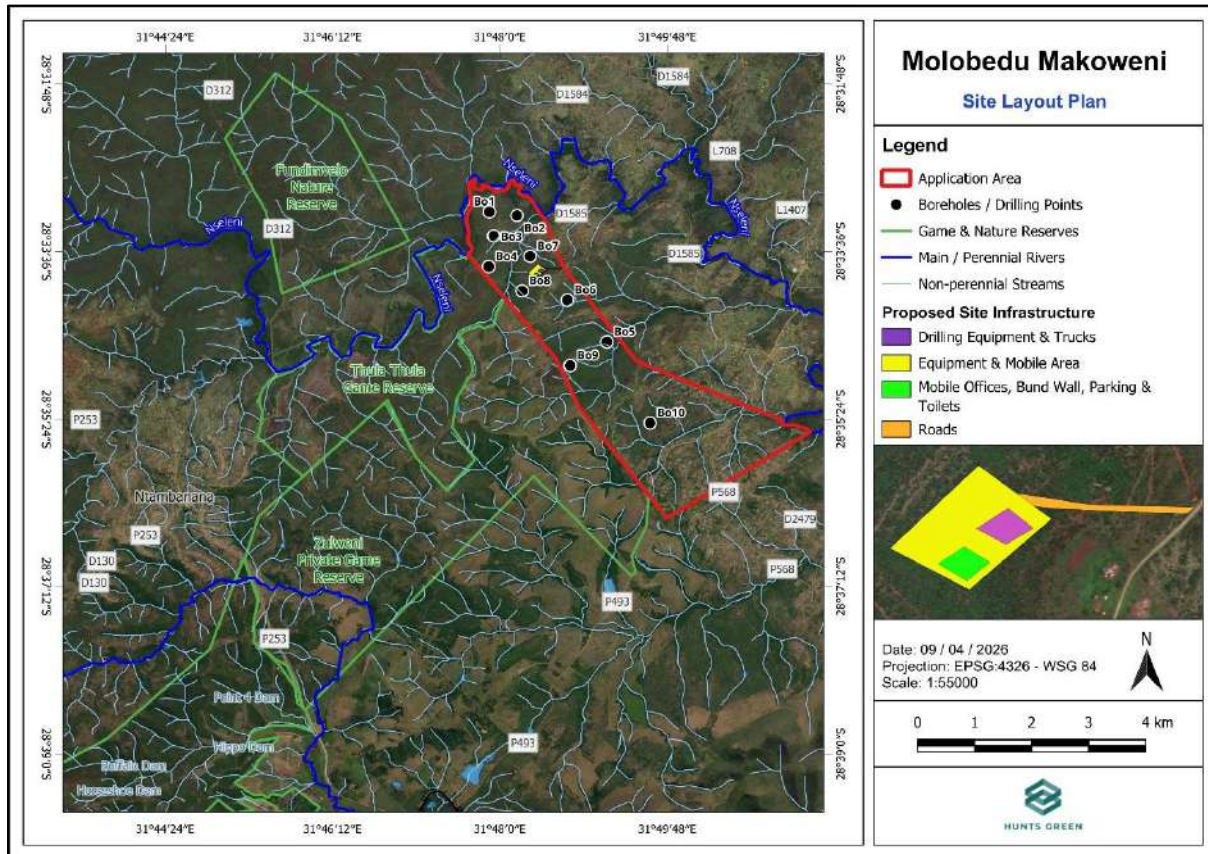


Figure 4-1: Site layout plan of the Application Area



5. Determination of Events

5.1. Risk Analysis

Risk analyses have been undertaken as part of the assessments carried out at the site and described in the relevant specialist reports as part of the application. The risk assessments typically considered applicable hazards, likelihoods of occurring, resultant impacts and mitigatory measures. This contingency plan has been developed based on the identified risks that may require emergency response.

5.1.1. Potential Emergences

The following are examples of potential unplanned emergency situations that may be encountered during the construction/operational phases of the Vahlengwe Mining Advisory and Consulting (list not exhaustive):

- Contamination of water resources from chemical spillages from upgradient operation.
- Hazardous Substances Incidents, such as oil spillages and
- Flooding.
- Social unrest or civil disorder.
- Severe weather events.
- Structural instability; and
- Transport and road incident.



6. Pollution Prevention

The following defines some of the proactive measures to be adopted to minimise any pollution triggering events. This list is not exhaustive, and further advice should be sought from the Environmental Manager if required.

6.1.1. Hierarchy of environmental controls

In accordance with the risk hierarchy, Vahlegwe Mining Advisory and Consulting recognises that the most effective strategy in terms of incident control is prevention. The measures that Vahlegwe Mining Advisory and Consulting has in place to prevent incidents from occurring in the first place comprise the design, installation and maintenance of 'hard' measures such as infrastructure, storage arrangements, etc., and 'softer' measures such as procedures, provision of spill response materials and training/competence assurance.

6.1.2. Construction Environment Management Plans

Any site-specific potential pollution risks around surface water, groundwater (aquifers and source protection zones), land, air and terrestrial and aquatic ecology are covered in respective (EMPs, they include location, distance to closest receptor, any particular working methods to protect against pollution and other adverse impacts. To supplement the EMPs, detailed step by step measures will be developed and communicated to all staff during inductions, toolbox talks and other briefings.

6.1.3. Site specific emergency preparedness and response plans

Site specific emergency preparedness and response plans define the specific emergency preparedness and response arrangements and equipment required for Vahlegwe Mining Advisory and Consulting to be able to deal with an emergency. Environmental content that must be included in the site-specific emergency preparedness and response plans:

- Overview of the scope of works.
- Potential environmental emergency situations and response procedures, including:
 - spillage of oils or chemicals,
 - discharge of silty water or other pollutant into a watercourse,
 - flood,
 - firewater runoff,
 - injury/death of animals,
 - archaeological/ heritage damage.
- Environmental issues and constraints, including but not limited to:



- locations of spill kits / extinguishers etc;
- local drainage layout (surface and foul water);
- risk receptors such as watercourses, ditches, primary aquifers, flood zones;
- fuel and chemical storage areas;
- waste storage areas;
- ecological protection areas;
- areas of influence such as adjacent works; and
- sensitive receptors such as residents.

Emergency contact details must include:

6.1.3.1. External Stakeholders

Table 6-1: External emergency contact details to be included in the site-specific emergency and response plans. This should be filled and posted in notice boards on site.

Contact	Contact name (if applicable)	Office Hours	Out of Hours
Emergency Services			
DWS (helpdesk)			
DWS Compliance Specialist			Helpdesk
Local Authority			
Environmental Health Officer			
Emergency Spill Response Contractor (include PO number)			
Waste Management Contractor			



6.1.3.2. Vahlengwe Mining Advisory and Consulting Contacts

Table 6-2: Internal emergency contact details to be included in the site-specific emergency preparedness and response plans. This should be filled and posted in notice boards on site.

Role	Contact Name	Office Hours	Out of Hours
General Manager			
Site Manager			
Environmental Manager			
Environmental Officer			
Security Manager			

6.2. Materials storage and Handling

6.2.1. Environmentally harmful liquids

Vahlengwe Mining Advisory and Consulting will use a number of environmentally harmful liquids including fuels, oils and other liquids, which have the potential to cause significant pollution to drainage systems, watercourses, and groundwater resources, in the event of a leak or spill. Additionally, they may cause health & safety risks, particularly around the clean-up of the spilt material.

It is therefore important that all liquids, fuels and oils are stored appropriately to minimise the risk of pollution.

Oil includes:

- Diesel
- Petrol
- Biofuels
- Biodegradable oil, usually lubricating or hydraulic oils
- Liquid bitumen-based products, for example waterproofing or damp proofing products, or
- coatings
- Cutting fluids



- Insulating oils, used as electrical insulator and coolant
- Synthetic oils (e.g. lubricating oils such as motor oil)
- Vegetable oils

Other liquids which may lead to environmental harm include:

- Paint, including spray paint
- Concrete washout water
- Chemicals e.g. antifreeze, wood preservatives, chlorine, brake fluid, cleaning materials
- Flocculants and coagulants
- Bentonite (harmful to water environment)
- Solvents
- Pesticides, herbicides
- Battery acid
- Admixtures (accelerators & retarders)
- Adblue
- Sewage effluent
- Trade effluent
- Sweeper arisings

6.2.2. Deliveries

All Deliveries must be recorded. Unloading must only take place in designated areas and must not be accepted without the correct delivery note.

Special care must be taken with liquid, gasses and other hazardous materials. Deliveries should always be supervised and checks made to ensure that the correct type and quantity of materials, substances and fuel is being delivered.



6.2.3. Storage and use

The storage, handling, use and disposal of any potentially hazardous materials must comply with the relevant statutory provisions, DWS and Health and Safety Executive codes of practice and guidance notes, together with any manufacturers' recommendations.

All fuels and chemicals must be stored in designated areas.

Where required these areas may need to be discussed with the relevant Local Authority (LA) and with the Department of Water and Sanitation (DWS). As they may be subject to consent requirements.

Tanks and containers should be labelled with the nature and volume of their contents, and the levels must be checked prior to delivery to prevent any overspills or overtopping of tanks.

Hazardous substance stores (including fuel and chemical stores) and areas at risk of spillage/leakage of polluting materials must be bunded above ground where possible in a safe and secure building or compound from which they cannot leak, spill or be open to tampering or vandalism. Bunded compounds to have an impervious base, which can hold at least 110% of the capacity of the tank or drum it contains (or >25% of combined capacity if more than one container) to minimise the risk of hazardous substances entering the drainage system or the underlying aquifer. Areas for transfer of hazardous substances (including refuelling areas) to be similarly protected.

Any long-term oil storage tanks and temporary storage of over 200 litres of oil in drums and mobile bowsters, as well as ancillary pipe work, valve, filters, sight gauges and equipment require secondary containment, e.g. bunding or drip trays (Control of Pollution (Oil Storage) (England) Regulations 2001). Also, any oil stored requires secondary containment, e.g. secondary bunding that is impermeable to water and oil, with no drainage valve fitted to drain rainwater.

The storage, handling, transportation and use of fuel, lubricants, chemicals and other hazardous substances is undertaken so as to prevent release into the water environment, including:

- Storing and using these substances a minimum of 100m from any watercourses.
- Where 100m distance is not possible ensure secondary containment is in place, namely bunding of 110% of the total volume of all reservoirs and containers (or >25% of combined capacity if more than one container).

Storage of hazardous substances near open drains is not permitted. All pipelines and fuelling points must be protected from vandalism and unauthorised interference and must be turned off and locked when not in use.

Site fuel lines will be in an accessible position above the ground where possible. Underground pipes and tanks may be subject to damage and corrosion. Where a fuel line must be laid underground, it should be corrosion resistant and placed in a protective sleeve or a duct with



open grating covers for inspection purposes. These must also be tested regularly as part of the Health, Safety and Environmental (HSE) inspections. Underground pipeline connections should have access points for inspection. Underground tanks and pipelines may be subject to special restrictions where there is a risk of pollution to groundwater.

When plant is dirty leaks on plant can go undetected for a period of time, it's important to keep plant couplings clean to enable early leak identification.

Absorbent pads or plant nappies must be used when filling smaller containers from tanks or drums to avoid drips and spills from entering the ground or drainage system. Use of drip trains should be avoided.

When not in use, vehicles, equipment and plant and any other sources of fumes, noise or dust, are to be switched off.

6.2.4. Refuelling

- Re-fuelling areas must be designated, and oil separation may be required;
- All refuelling, oiling and greasing will take place above absorbent pads/ plant nappies or on an impermeable surface which provides protection to underground strata and watercourses and away from drains as far as reasonably practicable;
- Vehicles must not be left unattended during refuelling; and
- Effluent resulting from discharge of refuelling areas must not be discharged to surface water drains. Spill procedure to be followed.

6.2.5. Reduce the risk of a leak or spill by:

- Eliminating the use of environmentally harmful materials where possible by substituting less harmful alternatives.
- Storing Control of Substances Hazardous to Health (COSHH) in COSHH stores and only the required quantities on-site;
- Preventing decanting wherever practicable by procuring the correct sized container for the task;
- Ensuring all harmful materials and kit (e.g. compressors, hand-held tools, generator) are stored in suitable containers within appropriate secondary containment (e.g. plant nappy, bund);
- Assess the liquids being stored and used on site and ensure that suitable and sufficient spill materials are provided for use in the event of a spill or leak. Spill material must be suitable for the liquids they are designed to contain and be of a size and



shape that are appropriate to the risk that has been identified. Spill kit guide in provided in section 7.3.1; and

- Risk of catastrophic events is minimised through implementation of the measures detailed in section 7.2.3 and implementation of the stormwater management plan for the Project.

6.2.6. COSHH Risk Assessment

A COSHH risk assessment must be completed when a hazardous substance is used, or a process is likely to generate a substance hazardous to health. Copies of Material Safety Data Sheets (MSDS) are not sufficient in themselves as a COSHH risk assessment.

COSHH assessments of all products will be kept in the COSHH register.

The COSHH Regulations apply to a wide range of substances and preparations (mixtures of two or more substances) which have the potential to cause harm to health if they are ingested, inhaled, or are absorbed by, or come into contact with, the skin, or other body membranes.

Further information about the type of substances that come under the COSHH regulations is provided in the COSHH Procedure.

6.2.7. Hazardous Waste

Because of the potential inherent risks of handling hazardous waste, it is especially important to understand and control the nature of the waste that is generated for storage, treatment, or disposal. Failure to adequately identify and classify generated wastes could result in inadequate treatment or disposal or unintended reactions that could release hazardous substances into the environment or cause fires or explosions. Therefore, recommended measures to control waste receipts and general measures to mitigate risks at industrial hazardous waste management facilities include:

- The storage, handling, use and disposal of any potentially hazardous materials will comply with the relevant statutory provisions, DWS and Health and Safety Executive codes of practice and guidance notes, together with any manufacturers' recommendations. Hazardous waste (including COSHH) must be disposed of in line with the Site Waste Management Plan;
- Hazardous waste shall be stored separately from other waste, and be adequately contained, labelled and covered. Secondary containment is required for liquid COSHH waste;
- Each COSHH waste stream must be stored separately. Mixing of COSHH waste is not permitted;
- Even if described as bio-degradable detergents must not be discharged to surface water drains, or through interceptors;



- Any waste that has arisen in response to a pollution incident needs to be described accurately (including any hazardous properties), segregated, stored, handled and disposed of using appropriate waste carriers/ licenced sites. Consignment notes are to be filled in and retained for a minimum of three years;
- Storage of hazardous substances near watercourses or open drains is not permitted. Hazardous waste shall be isolated from surface water drains, open water and/ or boreholes and be appropriately banded, labelled and covered;

In cases of doubtful identification, waste materials shall be treated as hazardous waste until proven otherwise.

6.3. Pollution control equipment

Access to pollution control equipment and spillage clean up facilities will be provided at all worksites and measures taken to prevent pollution caused by severe weather e.g. secure storage of materials.

Table 6-3 spill equipment overview provides an outline of the types of pollution control equipment to be used on site and its purpose. Pollution control methods shall be selected based on the potential and type of environmental incidents anticipated given the nature and location of the works.

A spill kit may contain a range of materials in a number of configurations such as drain covers, absorbent granules, absorbent booms (or socks), plant nappies, absorbent pillows etc. Spill kits should be provided at, or within easy reach of all locations where they are needed in order to:

- Block environmental pathways by, for example, protecting drains
- Reducing the risk of secondary accidents or environmental damage, such as contamination of water sources or fires that could arise from certain hazardous materials.; and
- Protect sensitive receptors.

Spill kits must also be provided in easily accessible areas within the site by Vahlegwe Mining Advisory and Consulting. The locations and contents of spill kits must be recorded within site documentation, and they should be checked regularly to ensure that they remain adequately stocked. Table 6-3 is an overview of spill equipment.

**Table 6-3: Spill equipment overview**

Spill equipment	Pollutant type	Equipment purpose
Spill kits 	Fuel, oil, hydrocarbons / chemicals	Spill kit stations will be located in high-risk areas, and as a minimum they will be located at refuelling areas, chemical/oil storage areas and in areas where work is in close proximity to water. Spill kits will consist of a selection of items appropriate to the nature of the works and environmental risk. The size and number of spill kits must be adequate to the potential risk: ■ Absorbent booms (floating); ■ Absorbent granules; ■ Heavy-duty plastic bags; ■ Leak Sealing Putty; ■ Hazardous waste bags; ■ Absorbent pads, rolls, socks and sweeps (see Table 7-4 Spill kit types for details); ■ Shovels; ■ Gloves; ■ Drain seals; and ■ Hammer and stakes
Absorbent pads and plant nappies	Fuel, oil, hydrocarbons / chemicals	■ All refuelling, oiling and greasing will take place above pads or on impermeable surfaces (e.g., plant nappy) with sealed drainage or an oil interceptor, which provides protection to underground strata and watercourses, and away from drains as far as is reasonably practicable; ■ Vehicles and plant will not be left unattended during refuelling;



		- Only construction equipment and vehicles free of oil/fuel leaks which could cause material contamination will be permitted on site; - Pads/Nappies will be placed below static mechanical plant as a temporary secondary containment; and - It is the responsibility of the Store manager at each worksite to ensure that spill kits, pads and plant nappies are continuously stocked and that sufficient supplies are maintained in stores.
Fire extinguisher	Fuel, water	Fire extinguishers appropriate to the work area (and spill kit) should be located next to spill kit stations, or the nearest locations clearly signposted at spill kit points to be prepared for the eventuality of a combined spill and fire incident.  Fire extinguisher colour codes
Spill barrier and containment system	Oil, hydrocarbons / chemicals	Boom - Temporary floating barrier used to contain an oil spillage

6.3.1. Types of spill kits

The type of spill kit required will depend on the nature of site activities. Consideration must be given to ensuring a selection of different equipment is available as might be required. Table 6-4 provides a summary of different spill kit types:

Table 6-4: Spill kit types

Spill kit type	Equipment purpose
Fuel & Oil (blue)	- Hydrophobic (don't absorb water) (such as ProEarth); - Absorb all types of oils; and - Suitable for spillages of oil in watercourses.



Maintenance (grey)	■ Absorb all kinds of industrial liquids including oils; ■ Hydrophilic (absorb water); and ■ Suitable for industrial uses where many different types of liquid are in use.
Chemical (yellow)	■ Suitable for aggressive fluids e.g. acids, kerosene; ■ Hydrophilic (absorbs water as well as chemicals); and ■ Suitable for laboratories, chemical plants, and areas where a number of chemicals are used.
Sedimentation & containment	■ Contain silt/turbidity curtains; ■ Suitable to contain silt and floating debris; and ■ Suitable for spillages of oil in watercourses.

6.4. Drilling Fluids and Cuttings

- Drilling fluids contained in lined pits or tanks.
- Cuttings disposed of at licensed facilities.
- No discharge into natural watercourses.

6.5. Waste storage and disposal

6.5.1. Waste Assessment / Inventory

- The Vahlengwe Mining Advisory and Consulting Environmental Officer must develop, implement and maintain a waste inventory reflecting all waste generated during construction for both general and hazardous waste streams;
- Construction method and materials should be carefully considered in view of waste reduction, re-use, and recycling opportunities; and
- Once a waste inventory has been established, targets for recovery of waste (minimisation, re-use, recycling) should be set.



6.5.2. Waste Collection, Handling and Storage

- All waste must be managed in line with a Site Waste Management Plan;
- Any waste generated should be evaluated using the waste hierarchy. Reduce, re-use & recycle methods to aid in the reduction of waste on site in the first place is preferential;
- All waste on site must be stored in designated areas. Waste will not be stored within 100 m of any controlled watercourse, surface or foul water drainage system;
- Hazardous waste must be stored within a bonded area constructed according to SABS requirements. The volume of waste stored in the bunds must not exceed 110% of the bund capacity;
- Skips and storage receptacles will be sheeted, or otherwise remain lidded or closed, when waste is not being deposited into them. They will also be covered to prevent the escape of waste whilst in transit and loaded for maximum payload efficiency. This requirement does not apply to metal and wood skips;
- All waste must be contained in waste storage areas;
- Liquid wastes will be stored on hard-surfaced areas with secondary containment systems to prevent spillages;
- Segregation of key waste streams must be facilitated to maximise the opportunity to re-use and recycle wastes generated on site, or to return to the supplier via a take-back scheme. Recycling and waste bins/skips/IBCs are to be kept clean and will be clearly marked/colour coded in order to avoid contamination of materials. Labels will be used to clearly indicate the contents of containers;
- Shelter will be provided to prevent materials such as cardboard and paper from deteriorating while being sorted or awaiting collection;
- Ensure waste exemptions or permits are in place if required, to enable for the storage and treatment of waste materials;
- Excavated materials, such as soils, will be carefully stored in segregated piles for subsequent reuse on the site, where possible. If the material is contaminated, then it will be kept separate from clean material;
- It must be assumed that any rainwater collected inside the bund is contaminated and must be removed and stored as hazardous waste and not released into the environment. If any leaks occur in the bund, these must be removed immediately;



- Contaminated materials must be stored on an impermeable surface with appropriate controls. Refer to the specific remediation strategy or Materials Manager for prescribed controls. These controls may include:
 - Contaminated materials will be sent for either treatment, recycling or recovery where appropriate, or disposal at appropriately permitted facilities.
 - Contaminated materials containing asbestos would need Vis queen cover, hydrocarbons would need bunding for leachate.
 - Assess the need for surplus waste slurry / water produced during tunnel construction requiring filtration prior to disposal, because of the anticipated quality.
 - Polymers used will be bio-degradable and non-hazardous to the water environment. Agreement with the Department of Water and Sanitation will be sought prior to their use and any licences obtained (where necessary). Discharges which contain polymers will be tested to show that they are bio-degradable and low risk to the water environment.

6.6. Site Drainage

Drainage is a pathway for pollutants to contaminate both watercourses and aquifers, they are at risk of being polluted with silt, heavy metals, chemicals or oils.

6.6.1. Works adjacent to water bodies

Measures will be taken to prevent the deposition of silt or other material arising from work operations in any existing watercourse, borehole, aquifer or catchment area. Measures include use and maintenance of tanks, bunds, silt fences or silt screens, as well as consideration of the type of plant used and the time of year for working in watercourses.

Measures will be taken with regard to 'in-river' works to minimise the release of suspended sediment and solids into the water column. For works requiring materials to be loaded and unloaded on the river, the contractor shall establish suitable management arrangements and mitigation measures to prevent spillages during transfer.

Monitoring methods and contingency arrangements will be in place during the works.

Sufficient time will be allowed for the DWS to issue permits where required.

6.6.2. Permits

Vahlengwe Mining Advisory and Consulting, and where applicable, its contractors are responsible for obtaining necessary permits and ensuring compliance with any conditions, for example, relating to the quantity and quality of effluent. Trade effluent from the site shall not be discharged to surface or foul water drains without obtaining consent from the DWS or water/sewage undertaker respectively.



Discharges into watercourses are regulated, consents must be applied for prior to any discharge operations. Discharge is not permitted without a permit. In many cases this will require treatment, in areas of high oil pollution risk it may be required to install an oil separator to protect surface water systems.

The Environmental Manager is responsible for ensuring the monitoring of compliance is undertaken.

Any ingress of water into excavations will be pumped to a suitable settlement lagoon or tank and the clear water discharged into the drainage system in a condition suitable to meet the requirements of the DWS/ trade effluent undertaker as applicable.

6.6.3. Flooding

The following proactive actions must be carried out to understand the risks of flash flooding for the Project:

- The weather forecast in the surrounding areas must be constantly monitored, especially during the wet season;
- All key equipment must be placed outside of the 1:100 year floodline of surrounding watercourses ;
- All contaminated water should be contained on site, as far as possible and discharges to the environment should only occur if necessary in an extreme flood event; and
- Bund and water channels to divert flood water to safe areas;

In the event of a flash flood onsite, the following emergency procedures will be implemented:

The Emergency Response Coordinator must be notified;

- All personnel onsite, including the designated Evacuation personnel must be immediately notified; and
- All equipment must be safely shutdown and all electrical equipment must be isolated.

6.7. Soils

Any contaminated soils encountered during excavation works will be screened, treated if necessary and either re-used on site or removed from site.

Contaminated materials will be disposed of in line with the Waste Management Plan.

Dust suppression techniques will be implemented, including water spraying in dry weather, wheel washing facilities for vehicles leaving the site and covering stockpiled material.



6.8. Vandalism and Security

Vandalism and theft are frequent causes of pollution. Lockable valves should be fitted to storage tanks, fences must be secured, doors and gates must be kept locked. Where possible all materials should be kept under cover and potential pollutants should be transferred into designated secured storage areas without delay. All possible measures must be taken to control unauthorised access to the site.

6.9. Extreme Weather Monitoring

Each work site should have a weather representative. The responsibility of this representative is to advise of any sudden changes to the weather forecast. The representative will be subscribed to weather updates for their work area.

When prolonged periods of heavy rain are forecast:

- Consult the site drainage/site water and silt management plan to identify the potential pathways and routes for the spread of pollutants. Consider boreholes as they are a high-risk pathway to groundwater;
- Keep water level in attenuation ponds as low as possible prior to the predicted heavy rains to maximise water storage capacity on site.

Details of procedures in the event of a flood are found within the Site-Specific Emergency Preparedness and Response Plans.

6.10. Fires

The following must be undertaken to minimise the risk of fires within the Project area:

- Compliance with the National Veld and Forest Fire Act (Act No. 101 of 1998);
- Burning of waste is strictly prohibited on site;
- Suitable precautions will be taken (e.g. suitable fire extinguishers, water bowsers, welding curtains) when working with welding or grinding equipment.;
- All fire control mechanisms (firefighting equipment) will be routinely inspected by a qualified investigator for efficacy thereof and be approved by local fire services;
- All personnel on site will be made aware of general fire prevention and control methods, and the name of the responsible person to alert to the presence of a fire;
- No fires are allowed on site, unless in dedicated areas approved by the Project Manager; and
- Dedicated smoking areas to be provided. Cigarette butts may not be disposed of onsite.



The following emergency procedures must be implemented when fire occurrence (or evidence thereof) is noted in the vicinity of the proposed development site during the Construction and Operational phases. The procedure is provided below:

The Emergency Response Coordinator/ Fire Marshall or Safety Officer must be notified;

- Personnel in the immediate vicinity of the fire must be immediately notified;
- All persons located in the immediate area of the fire must be evacuated. Evacuation must be carried out as per the Evacuation Procedure;
- All doors and windows of buildings and vehicles that are in the immediate vicinity of the fire must be closed;
- The fire must be contained with the correct extinguisher by trained personnel; and
- Those requiring assistance must be assisted and first aid must be rendered by trained personnel.

If a fire is discovered, the following must be undertaken:

- Raise the fire alarm or notify the relevant emergency personnel;
- Notify the local Fire Department;
- Remove anyone from immediate danger;
- Confine fire by closing doors and windows; and
- Do not attempt to put out the fire unless trained to do so;

In the event of a fire, the following procedures need to be carried out in sequence:

- Notify the location of the fire to:
 - The relevant emergency personnel; or
 - The site manager.
- The above personnel will immediately notify the necessary emergency services;
- Proceed directly to the nearest designated emergency exit.;
- Do not panic or run;
- Do not try and collect personal belongings;
- Assemble in the designated assembly points;



- Once assembled, help to account for occupants and report to the emergency staff if any occupants are unaccounted for and may be still in the building; and
- Remain at the assembly point until the relevant authority states it is safe to re-enter.

6.11. Firewater

Firewater runoff is hazardous to the environment, and it must not be allowed to enter the drainage system. Please refer to the site-Specific Emergency Preparedness & Response Plan for details.

6.12. Shut down/ Start-up checks

Planned shutdowns (i.e. Christmas period, Easter and holidays) require shutdown and pre-start checks to ensure that work areas are left in a safe state and that when work recommences, they do so in a safe and controlled manner with all relevant mitigations and changes. Shut-down checklist must be completed for each site prior to the shutdown and start-up checklist must be completed on re-commencement of works.

7. Management of Emergency Procedures

The following section discusses the emergency procedures to be followed in the event of an incident or emergency that may occur during the construction and operational phases of the Vahlengwe Mining Advisory and Consulting. The following are some of the management objectives:

- Minimise environmental impacts associated with emergency procedures;
- Provision of a safe and healthy working environment to construction and operational personnel;
- Ensure public health and safety during the construction and operation of the site;
- Establishment of clear roles, responsibilities and procedures to ensure swift coordinated responses to any environmental incidents or emergencies;
- Provision of a timely and accurate information to stakeholders and the public;
- Compliance with regulatory requirements for emergencies; and
- Ensure the availability of equipment and resources (e.g. personnel, chemicals) during emergencies.

7.1. Environmental Incident Response

Emergency response and responsibilities are detailed in the Site-Specific Emergency Preparedness and Response Plans, including:



- Emergency response team contact details,
- Site plans,

All of the above must be followed for all incidents.

In the event of an environmental incident occurring, such as

- Unaccounted contamination discharged to controlled waters;
- Ecological damage (e.g. killing of an animal or destroying protected habitat);
- Spread of invasive or injurious species;
- Contamination of waste, e.g. mixing of hazardous and non-hazardous waste; and
- Disturbance of archaeological or cultural heritage.

Table 7-1 summarises the environmental incident response that should be followed in the event of an environmental incident.

Table 7-1: Environment Incident Response

Response	Action
Identification and Initiation of Execution of Emergency Response	Direct observation includes seeing the incident happening or being involved in the incident. Indirect observation includes learning of the incident through, for example, complaints, feedback, or information provided by internal stakeholders. Execution of Emergency Response: ■ Assess the situation; ■ Ensure that the incident scene is safe
Contain	Take all reasonable measures to contain and minimise the effects of the incident, including its effects on the environment and any risks posed by the incident to the health, safety and property of person.
Notification and Reporting	All environmental incidents must be reported within 24 hours internally to all relevant stakeholders and externally to relevant interested parties affected by the incident as identified in terms of the site EMS. The readily available information must be used for the initial notification and reporting. The following actions must be undertaken: ■ Contact the Site Manager and Environmental team and environmental discipline specialists as required;



	■ Environment Manager to ensure the relevant Regulatory Body (i.e. DWS) is notified; ■ Contact the specialist contractors if required (authorisation required from Site Agent/ Project Manager/ Environment Manager); ■ Make a record (photos, notes) of the incident and the affected area/ damage/ invasive or injurious species.
Clean Up	Complete actions as directed by the Vahlengwe Mining Advisory and Consulting Environmental Team or the environmental discipline specialist.
	Additional actions ■ Watercourse incidents: ▪ Deploy silt mitigation/ booms to minimise spread of pollutants. ▪ Arrange for the sampling of water where safe to do so and on the advice of the environment team ▪ Re-plan works, discharge arrangements with agreement of the environment team prior to resuming work. ■ Soils that have been contaminated with hydrocarbons or other hazardous substances can be excavated and stored in a contained area to be assessed for re-use by the Materials Team.

7.1.1. Spill response

Hydrocarbons such as diesel, petrol and chemicals will be kept on site, there is an inherent possibility that spills can occur on land and water resources. All spills are classed as incidents and must be reported. In the event of a fuel or chemical spillage the following procedure (outlined in Table 7-2) must be employed, Figure 7-1 further illustrates the spill response procedure to be undertaken:



Table 7-2: Spill Incident Response

Response	Action
Stop	■ Stop work immediately ■ Assess the situation ■ can you clean up the spill safely and with the equipment you have; ■ Utilise or obtain the correct Personal Protective Equipment (PPE) for handling the incident; ■ Assess if an Emergency Spill Contractor is required (check with the Agent/ Project Manager/ Environmental Manager) ■ Get the HELP you required to deal with the spill safely ■ If possible, prevent any more material from spilling
Contain	■ Contain the spillage using spill kit contents (pads, socks or absorbent granules) immediately; ■ In the event of a large spill, sand or similar can be used to contain the spill/prevent the spread of pollution; ■ Do NOT allow the spill to enter the local drainage system/ watercourses. Cover all drains. Consult the site drainage/site water and silt management plan to identify the potential pathways and routes for the spread of pollutants; ■ For wet ground, use spill pads or dispersant to break down oil sheen; and ■ In the event of pollution reaching a watercourse, deploy booms and use pads or similar absorbents to contain surface pollution before



	it reaches the watercourse. For safety reasons ONLY specialist teams to enter the watercourse for clean up purposes.
Notification	■ Immediately report incident to Supervisor responsible, who will then report to the Environmental Team, Project Manager; ■ Environment Manager to ensure the relevant Regulatory Body is notified; ■ For spills that cannot be managed by the Site team contact the emergency spill contractor if required upon the direction of the Agent/ Project Manager/ Environment Manager;
Clean Up	Once the spill has been properly contained/soaked up DISPOSE of the waste material. Used spill kit should be placed in a designated COSHH bin separate from all other types of waste. Do not put used spill kit material in any of the skips; and Material which has been pumped may be stored in empty oil drums or other suitable container prior to removal by a registered special waste contractor. Soils that have been contaminated with hydrocarbons or other hazardous substances can be excavated and stored in a contained area to be assessed for re-use by the Materials Team.



Figure 7-1:Spill Response

7.1.2. Emergency Simulations

Emergency preparedness and procedures, where practical, must be practiced according to the annually reviewed schedule developed by the Environmental Specialist/alternate. Other drills are scheduled by the Safety and Occupational Hygiene Sections. Records are kept by the responsible persons. The emergency preparedness simulations shall be in the form of a physical exercise.

After each practice drill or actual emergency, the effectiveness of the procedure will be evaluated and revised where necessary during a post-mortem meeting/discussion. A report of the emergency, the actions taken and the effectiveness thereof will be presented to top management for the more serious emergencies, at the discretion of the Environmental Specialist. The less serious emergencies will only be reported via the incident reporting system. The seriousness of an emergency will be decided at the discretion of the Environmental Specialist



7.1.3. Emergency Spill Response Contractor

In the event of a serious spillage, which cannot be contained and/or cleaned-up by the Project team, contact will be made with the specialist spill response contractor. The decision whether emergency spill contractor is required lies with the Environmental Manager.

Spill response posters with contact details for the emergency spill response contractor, must be displayed on all working sites. Emergency spill response contractor details must be included in the CEMPs and the Site-Specific Emergency Preparedness and Response Plans.

8. Environment Incident Investigation

9. Incident Monitoring

In the event of an incident on site which has the potential to impact water resources, the situation would be dealt with as detailed in the Vahlengwe Mining Advisory and Consulting Environmental Incident Control Plan. In particular, the following steps are required to be taken:

- Environmental Manager to be notified immediately and provide specialist technical support where necessary, including increased and additional water sampling to identify possible impacts on water receptors, where necessary.
- Incident monitoring to be implemented to quantify extent and level of contamination of water bodies, if any, as well as determine if mitigation measures are appropriate and successful.
- Relevant authorities to be informed of the incident by the appropriate Environmental Manager, along with the action plan for response. Authorities to be contacted include the Department of Water and Sanitation and Local Authority. It may be necessary to inform additional affected parties as appropriate.

10. Incident Reporting

All incidents are to be reported on internal incident reporting platform.

All incidents must be notified immediately or as soon as practically possible to the area manager. This will then be communicated to the Environmental Manager by telephone who will be responsible for notifying the Project Director, Health, Safety, Environment and Security Directors as required, as well as the Vahlengwe Mining Advisory and Consulting stakeholder relations team.

During the immediate response to a pollution event the following information should be provided by the person discovering or reporting the incident;

- Description of the pollution incident;
- Location (with coordinate reference if possible);



- Any contributory factors;
- Any observed affects; and
- Any immediate mitigation actions.

Once an Investigation has been carried out corrective actions will be agreed, all incidents are recorded in the Vahlegwe Mining Advisory and Consulting Incident register. These records will be available to DWS.

Table 10-1: Severity of environmental Incidents

Type	Level 1	Level 2	Level 3	Level 4
Environment	Incidents that cause persistent or extensive harm or damage to the environment e.g. requiring external involvement to clean up (and therefore a high likelihood of regulatory action including receipt of a statutory notice or other intervention by an enforcing authority). Persistent and significant breach of permit / licence or consent conditions.	Incidents that have caused or may cause significant harm Or damage to The environment. or Persistent non-significant breach or significant nonpersistent breach of conditions.	Incidents that have caused minor harm or damage to the environment (e.g. minor spill onto the ground, noise monitor exceedance).	An event, controlled Through implementation of an effective incident control measure (e.g. drip tray used, effective use of noise barrier).

Reportable to Authorities (within 24 hours):

- Any spill >200 L
- Any spill entering a watercourse
- Any fire involving hydrocarbons
- Any incident causing environmental harm



Authorities include:

- DWS (Section 20 NWA)
- DMRE (MPRDA compliance)
- DEA/DMRE (NEMA Section 30)

11. Complaints

Extensive liaison has been undertaken with the key non-regulatory stakeholder, through public participation, and as extensive liaison and direct reporting to them is required throughout the various phases of the Project, complaints from this organisation are not anticipated as any issues will be dealt with through the regular review process.

Key points of contact have been established with other non-regulatory public stakeholders such as Local Authorities and any complaints from such organisations are likely to come via DWS.

It is more likely that any complaints will come from the public, either directly, or via community liaison groups or potentially via councils, especially where statutory nuisance is involved (although there is a low likelihood of this for issues associated with the water environment). The focus on complaint management is therefore on private/individual complainants.

11.1. Procedures in the event of Complaint

The complaints procedure is detailed in the Community Liaison Plan. Complaints will be logged by Local Communities and communicated to the Vahlengwe Mining Advisory and Consulting helpdesk. Complaints received via the Helpline will be directed to Vahlengwe Mining Advisory and Consulting Stakeholder Engagement management team who will inform the Vahlengwe Mining Advisory and Consulting Environmental team and Vahlengwe Mining Advisory and Consulting managers for the relevant Project area

Any complaints received in person, by the workforce on site, must log the name and contact details of the complainant, including the nature of the complaint and how the team dealt with the individual(s). This information will also be forwarded to the Vahlengwe Mining Advisory and Consulting Helpdesk.

For noise, dust and air quality data, Vahlengwe Mining Advisory and Consulting will seek to release data relating to complaints received by the relevant local authority within 48 hours of the request being made by the relevant local authority.

12. Assurance

Inspection of pollution control measures will be required regularly. The frequency will be dependent on the site's environmental risk profile. The briefings will be signed and stored in an accessible area. This allows easy access if the issue escalates and provides a record of decisions made.



If an issue arises mid shift this must be reported and recorded through the appropriate channels. Daily site team inspections will ensure pollution from leaks, damaged storage areas, lack of secondary containment measures and unexpected changes are mitigated or remediated.

All site works are subject to the environmental inspection regime.

Routine site Environmental inspections shall concentrate on EMPs compliance and any other site-specific environmental issues and pollution prevention. Frequency of inspections is determined by resource level as outlined in the Site EMPs. Where there is an increased level of risk due to the method and / or location of work, or work is being carried out in an area of increased sensitivity, the frequency of inspection will be increased. The frequency of inspection will also be increased where there are regular repeated failures of compliance identified through inspection, audit or other means.

This inspection frequency process will be applied to any project works irrespective of whether they are carried out by Vahlengwe Mining Advisory and Consulting or a subcontractor.

All Environmental inspection reports are recorded locally and stored centrally for future use and reporting.

13. Communication

13.1. Internal Stakeholders

Internal stakeholders may include those listed below. The following may need to be notified of an environmental incident:

- Vahlengwe Mining Advisory and Consulting Contact
 - Environmental Manager
 - Health and Safety Manager
 - Site Manager
 - Other personnel as required (e.g. staff trained in use of pollution control equipment).

Internal stakeholder emergency contact details should be included as part of the site mobilisation pack and included in the EMP and the Site-Specific Emergency Preparedness and Response Plan. All notifications should be managed as per the Vahlengwe Mining Advisory and Consulting Incident and Investigation process as well as the Incident Response Process.

13.2. External Stakeholders

External stakeholders may include those listed below. The following may need to be notified of an environmental incident:



- Emergency services;
- Department of Water Sanitation;
- Environmental Health Officer;
- Local Water Company/ Sewage Undertaker;
- HSE;
- Waste Management Contractor;
- Emergency Spill Response Contractor; and
- Any specialist clean-up contractors (if required);

External stakeholder emergency contact details should be included as part of the site mobilisation pack and included in the EMP and the Site-Specific Emergency Preparedness and Response Plan. These will vary from location to location.

13.2.1. Media Liaison

Any statement to the press or media shall be managed by the Vahlegwe Mining Advisory and Consulting Stakeholder Relations team in conjunction with the Vahlegwe Mining Advisory and Consulting Management team, led by the Vahlegwe Mining Advisory and Consulting Project Director and Sustainability Director.

14. Training

Training aims to create an understanding of the Environmental Emergency Preparedness and Response Plan and the responsibilities of the relevant personnel, as well as educate site employees on the procedures to be followed during an emergency. To be effective, an Emergency Preparedness Response Plan must be clearly communicated to all site personnel. Training will be tailored to the audience, based on their designated roles and responsibilities. Records will be kept of the training provided, as well as containing the details of the attendees. Training for environmental incidents and pollution prevention and incident response will include:

- Awareness of the potential for harm to people and the environment from the materials held on-site;
- Pollution prevention controls;
- Information on the sensitivity of the environment surrounding the site (this must include any consent information for the site);



- Use of the correct personal protective equipment and any appropriate and/or necessary health and safety training Incident reporting procedures;
- Safe and correct use of all spill clean-up equipment or pollution prevention structures and/or devices on site, including isolating drainage in the event of a major spill;
- Safe handling and legal disposal of contaminated materials and waste resulting from an incident;
- Appropriate and safe decontamination; and
- For catastrophic event response training and drills please refer to Catastrophic/Major Incident.

14.1. Specialist Training

An on-site training department should be established on-site during the construction and operation phases of the Project. This department in conjunction with the Environmental Officer or Safety Officer are responsible for ensuring job specific training for personnel performing tasks, which can cause significant environmental (e.g. receipt of bulk hazardous chemicals/fuel, hazardous materials handling, responding to emergency situations etc.). Courses such as first aid training , Fire Fighting (Level 1 and Level 2) should be mandatory and sourced from approved training providers.

14.2. Environmental Awareness Notice Boards

The objective of placing environmental awareness notice boards is to promote a culture of environmental responsibility and ensure that workers and visitors are informed about best practices for sustainability, safety, and environmental protection. Specifically, the key objectives of these notice boards are:

- **Education and Awareness:** To inform all site personnel about the environmental policies and procedures that must be followed during the construction process, such as waste management, energy conservation, and minimizing pollution;
- **Promote Compliance:** To ensure compliance with environmental regulations and standards by clearly displaying rules related to waste disposal, noise control, air quality, and water conservation, helping prevent legal violations or fines;
- **Waste Management Guidelines:** To provide clear instructions on how to handle, segregate, and dispose of different types of waste (e.g., hazardous materials, recyclables, general waste), promoting a clean and safe working environment;
- **Reduce Environmental Impact:** To encourage actions that reduce the environmental footprint of construction activities, such as reducing water and energy usage, managing emissions, and controlling dust or noise pollution;



- **Health and Safety:** To highlight the importance of environmental safety, which can directly affect worker health (e.g., exposure to hazardous chemicals or pollutants) and overall site safety;
- **Emergency Response and Spill Management:** To provide information on the proper steps to take in the event of an environmental emergency (e.g., spills, contamination) and the location of spill kits, first aid kits, and emergency contacts; and
- **Engagement and Responsibility:** To foster a sense of environmental responsibility among all workers and contractors, making them aware that everyone has a role to play in minimizing environmental impacts on and off the construction site.

By placing these notice boards strategically around the project site, workers and visitors are constantly reminded of the environmental goals and expectations, helping maintain a more sustainable and safer working environment

14.3. Spill Drills

Spill drills must be arranged by the Environmental Managers on a 6-monthly basis. Each drill must be tailored to reflect the type of activity taking place and site-specific risks (such as proximity to watercourse/ aquifers/ ecological constraints).

Spill drills must be recorded, learning and feedback from the drills to help identify areas for improvement must be included in the subplot trackers. Copies of evidence to be forwarded to the Environmental Officer.

15. Conclusion

This Contingency Plan ensures that the Molobedu Makoweni prospecting project operates in full compliance with South African environmental legislation. When implemented correctly, it will prevent pollution, protect water resources, and ensure rapid, effective response to any unplanned events.



16. Details of Specialist

This Specialist Report has been compiled by the following specialist:

Table 16-1: Details of the Specialist(s) who prepared this Report

Responsibility	Report Writing
Full Name of Specialist	Simamkele Baqa
Professional Accreditation	<i>Pri.Nat.Sci. #121131</i>
Highest Qualification	MSc
Years of experience in specialist field	>10

Declaration of the Specialist

I, **Simamkele Baqa** as the appointed specialists hereby declare/affirm the correctness of the information provided or to be provided as part of the application, and that I:

in terms of the general requirement to be independent:

*other than fair remuneration for work performed/to be performed in terms of this application, have no business, financial, personal or other interest in the activity or application and that there are no circumstances that may compromise my objectivity;
or*

am not independent, but another specialist that meets the general requirements set out in Regulation 13 have been appointed to review my work (Note: a declaration by the review specialist must be submitted);

in terms of the remainder of the general requirements for a specialist, am fully aware of and meet all of the requirements and that failure to comply with any the requirements may result in disqualification;

have disclosed/will disclose, to the applicant, the Department and interested and affected parties, all material information that have or may have the potential to influence the decision of the Department or the objectivity of any report, plan or document prepared or to be prepared as part of the application;

have ensured/will ensure that information containing all relevant facts in respect of the application was/will be distributed or was/will be made available to interested and



affected parties and the public and that participation by interested and affected parties was/will be facilitated in such a manner that all interested and affected parties were/will be provided with a reasonable opportunity to participate and to provide comments;

have ensured/will ensure that the comments of all interested and affected parties were/will be considered, recorded and submitted to the Department in respect of the application;

have ensured/will ensure the inclusion of inputs and recommendations from the specialist reports in respect of the application, where relevant;

have kept/will keep a register of all interested and affected parties that participate/d in the public participation process; and

I am aware that a false declaration is an offence in terms of regulation 48 of the 2014 NEMA EIA Regulations.

Signature of the specialist

Simamkele Baqa

Full Name and Surname of the specialist

Hunts Green Consulting

Name of company

March2026

Date

HYDROLOGICAL IMPACT ASSESSMENT IN SUPPORT OF THE PROSPECTING RIGHT APPLICATION OF COAL ON LOT 289 EMPANGENI 13389 GU AND LOT 285 EMPANGENI 13400 GU IN KING CETSHWAYO DISTRICT MUNICIPALITY, KWA-ZULU NATAL PROVINCE

Document Number: HG01-00-GEN-2026.01.27-r1-REP-VAH118

Prepared By:

Hunts Green Consulting (Pty) Ltd

Prepared For:

Vahlengwe Mining Advisory and Consulting (Pty) Ltd

Attention To:

Lusizo Nqasha

Date:

March 2026

Hunts Green Consultants (Pty) Ltd

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HUNTS GREEN

**HYDROLOGICAL IMPACT ASSESSMENT IN SUPPORT OF
THE PROSPECTING RIGHT APPLICATION OF COAL ON LOT
289 EMPANGENI 13389 GU AND LOT 285 EMPANGENI 13400
GU IN KING CETSHWAYO DISTRICT MUNICIPALITY, KWA-
ZULU NATAL PROVINCE**

March 2026

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EXECUTIVE SUMMARY

Hunts Green Consulting (Pty) Ltd was appointed by Vahlengwe Mining Advisory and Consulting (Pty) Ltd, on behalf of Molobedu Makoweni (Pty) Ltd, to undertake a Hydrological Impact Assessment in support of a Prospecting Right application for coal on Lot 289 Empangeni 13389 GU and Lot 285 Empangeni 13400 GU, within the King Cetshwayo District Municipality, KwaZulu-Natal Province. The assessment was conducted in accordance with the National Environmental Management Act (NEMA), the National Water Act (NWA), the Mineral and Petroleum Resources Development Act (MPRDA), and relevant DWS Best Practice Guidelines.

The proposed prospecting activities cover approximately 1158 ha, with a designated operational footprint of ~5.30 ha for supporting infrastructure. Prospecting will be undertaken using mechanised core-drilling methods, which are temporary, small-scale, and do not involve large-scale excavation, dewatering, or permanent hydrological alteration. A field investigation was conducted on 14 January 2026, during which surface water samples were collected and analysed by a SANAS-accredited laboratory to establish baseline water quality conditions.

Baseline results indicate that the catchment already experiences elevated microbial loads, suspended solids, salinity, and traces of hydrocarbons. The Application Area falls within the W12G sub-quadernary catchment adjacent to the Nseleni River (SQR W12G-03229), which is classified as having High Ecological Importance and Sensitivity. Despite this sensitivity, the limited scale and temporary nature of the prospecting activities mean that hydrological risks are inherently low.

Potential impacts relate primarily to hydrocarbon spills, contaminated runoff, sediment mobilisation, and poor waste handling. These risks can be effectively mitigated through bunded fuel storage, stormwater separation, erosion control, proper waste management, and strict implementation of the Pollution Prevention Contingency Plan. With mitigation, all identified impacts reduce to Low significance.

Cumulative impacts, when considered alongside existing land uses and catchment pressures, remain manageable. Rehabilitation of drill pads and disturbed areas will ensure that no long-term hydrological impacts persist. A one-year post-closure monitoring period is recommended to confirm the absence of residual effects, which is appropriate for prospecting projects of this scale and nature.

Overall, no hydrological fatal flaws were identified. The proposed prospecting activities are considered environmentally acceptable from a hydrological perspective, subject to full implementation of the recommended mitigation and monitoring measures.

Recommendations

It is recommended that the project proceed subject to strict implementation of the Pollution Prevention Contingency Plan, bunded hydrocarbon storage, stormwater separation, erosion control, and a structured water-quality monitoring programme. Immediate rehabilitation of disturbed areas and one year of post-closure monitoring are essential to ensure that no



residual hydrological impacts persist. With these measures in place, all identified impacts reduce to Low significance, and the project is considered hydrologically acceptable.

Reasoned Opinion of the Specialist

Based on the findings of the desktop assessment, field investigation, baseline water quality analysis, and hydrological impact assessment, it is the specialist's reasoned opinion that the proposed prospecting activities on Lot 289 Empangeni 13389 GU and Lot 285 Empangeni 13400 GU can proceed without causing significant or irreversible impacts to surface water resources, provided that the recommended mitigation measures are fully implemented as detailed in this report.

There are no hydrological fatal flaws associated with the proposed prospecting right application. The project is considered environmentally acceptable from a hydrological perspective, subject to full compliance with the mitigation measures and monitoring requirements outlined in this report.



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LIST OF ACRONYMS AND ABBREVIATIONS

BSPs	Biodiversity Sector Plans
CBA	Critical Biodiversity Areas
CMAs	Catchment Management Agencies
CR	Critically Endangered
DMPR	Department of Mineral and Petroleum Resources
DMRE	Department of Mineral Resources and Energy
DWS	Department of Water and Sanitation
EAA	Environmental Authorisation Application
EAP	Environmental Assessment Practitioners
EC	Ecological Categories
EIS	Ecological Importance and Sensitivity
EN	Endangered
GPS	Global Positioning System
HGM	Hydrogeomorphic unit
KZN	KwaZulu-Natal
LC	Least Concern
MPRDA	Minerals and Petroleum Resources Development Act
NBA	National Biodiversity Assessment
NEMA	National Environmental Management Act
NEMBA	National Environmental Management: Biodiversity Act
NEMWA	Waste Management Act
NFEPA	National Freshwater Ecosystem Priority Areas
NT	Near Threatened
NWA	National Water Act
NWCS	National Wetland Classification Systems
NWM5	National Wetland Map 5
NWRS III	National Water Resource Strategy III
PES	Present Ecological Status
PAs	Protected Areas



RAM	Risk Assessment Matrix
RMO	Recommended Management objective
SACNASP	South African Council for Natural Scientific Professional
SAIIAE	South African Inventory of Inland Aquatic Ecosystems
SACS	South African Committee for Stratigraphy
SANBI	South African National Biodiversity Institute
SANLC	South African National Land Cover
SQRs	Sub-Quaternary Reaches
UQ	Uranium Quantity
VU	Vulnerable
WMAs	Water Management Areas
WUA	Water Use Authorisation
WULA	Water Use Licence Application



1 Introduction

Hunts Green (Pty) Ltd was appointed by Vahlengwe Mining Advisory and Consulting (Pty) Ltd on behalf of Molobedu Makoweni (Pty) Ltd to undertake a hydrological impact assessment in support of an of prospecting right application of coal in King Cetshwayo District Municipality in the Kwazulu-Natal Province.

1.1 Project Location and Extent

The Environmental Authorisation application has been lodged with the Department of Mineral and Petroleum Resources (DMPR Reference No: KZN 30/5/1/1/2/ 12129 PR), which is the Competent Authority for environmental authorisations related to prospecting activities in terms of the National Environmental Management Act (NEMA). The project seeks to establish regulated coal extraction operations on approximately 15180 ha.

The identified properties forming part of the application area are as follows:

- Lot 289 Empangeni 13389 GU, and
- Lot 285 Empangeni 13400 GU
 - Portion GU/13400

The proposed Application Area is located near Tshokolwane Village, 19 km North of Empangeni and 21 km West of KwaMbonambi town, accessible via the R34 access road, within Wards 17, 32 and 33. The site falls under the jurisdiction of the uMhlathuze Local Municipality and the Mfolozi Local Municipality, within the King Cetshwayo District Municipality, KwaZulu-Natal Province (see Figure 1-1).

1.2 Project Description

The proposed Prospecting Right (PR) project, to be undertaken by Molobedu Makoweni (Pty) Ltd, to excavate and prospect for coal value, in respect of Lot 289 Empangeni 13389 GU, and Lot 285 Empangeni 13400 GU, located within the King Cetshwayo District Municipality, KZN Province. The project seeks to establish regulated coal extraction operations on approximately 15180 hectares. The site supports regional construction and infrastructure needs through sustainable extraction of coal.

The project requires environmental authorization in terms of the National Environmental Management Act (NEMA, 1998) and a prospecting right under Section 16 of the Mineral and Petroleum Resources Development Act (MPRDA, 2002). Several other legislative frameworks apply, including the National Water Act, the National Environmental Management: Biodiversity Act, and the National Environmental Management: Air Quality Act. The project is designed to operate within the framework of South Africa's environmental legislation, including the National Environmental Management Act (NEMA). It is subject to a Basic Assessment (BA) process as prescribed by the Environmental Impact Assessment (EIA) Regulations. Thus, prospecting activities will be conducted using mechanised equipment, primarily drill rigs, to ensure efficient and controlled resource recovery.



Molobedu Makoweni (Pty) Ltd will demonstrate its commitment to responsible mining practices and environmental stewardship while contributing to the economic development of the region. Vahlengwe Mining Advisory and Consulting (Pty) Ltd, hereafter “Vahlengwe”, has been appointed by Molobedu Makoweni (Pty) Ltd as the independent Environmental Assessment Practitioner (EAP) to facilitate the Environmental Authorisation for the prospecting right application for exploring coal value.

The PR area applied for covers an area of approximately 1,158.0 ha, where the applicant intends to use drill rigs to extract coal core samples. The main objective of core drilling is to collect core samples, which is used to check the mineral content and the quality of the rock. Core drilling is a rotary cutting drilling method consisting of a ring-shaped drill bit armed with cutting tools, which is forced into the rock surface and rotated clockwise at a high speed. A core sample is cut out of the rock for analysis. Drilling a coal sample for coal exploration typically takes a few hours to a few days per hole, depending on the depth, geological conditions, core recovery method and drilling speed. It is anticipated that the exploration will take 5 years, with the possibility of an extension of 3 years.

Drilling the individual cores disturbs a small footprint per drill pad, does not involve large scale excavation, the activity is temporary and short in duration, therefore, there is no significant hydrological risk. However, the supporting activities may cause surface water risks, such as hydrocarbon spills, contaminated runoff from storage areas, poor waste handling and machinery leaks. Vahlengwe has commissioned a separate pollution prevention contingency plan to manage these identified risks. This hydrological report focuses on the portion of the application area (~5.30 ha) designated for the construction of infrastructure and other project-related activities, rather than the entire application area.

To undertake this mining activity, the following infrastructure is required, which includes (Figure 1-2):

- Administration mobile offices;
- Ablution facilities;
- Packing bay for machineries;
- Packing for staff and visitors;
- Bunded walls to store chemicals like diesel or fuel;
- Waste bins; and
- Equipment such as the excavators, front-end loaders, water tankers, and dump trucks.

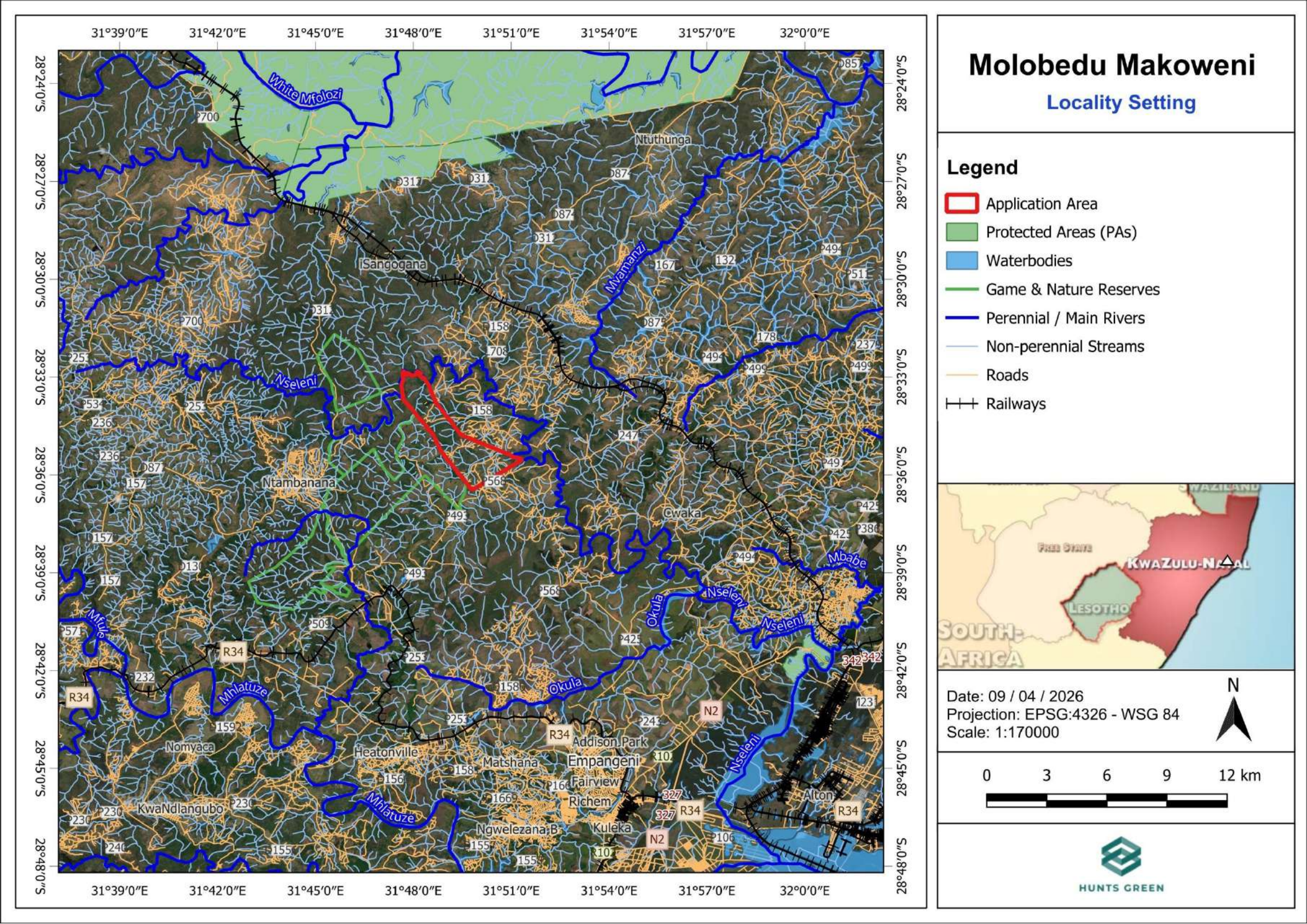


Figure 1-1: Locality of the Application Area

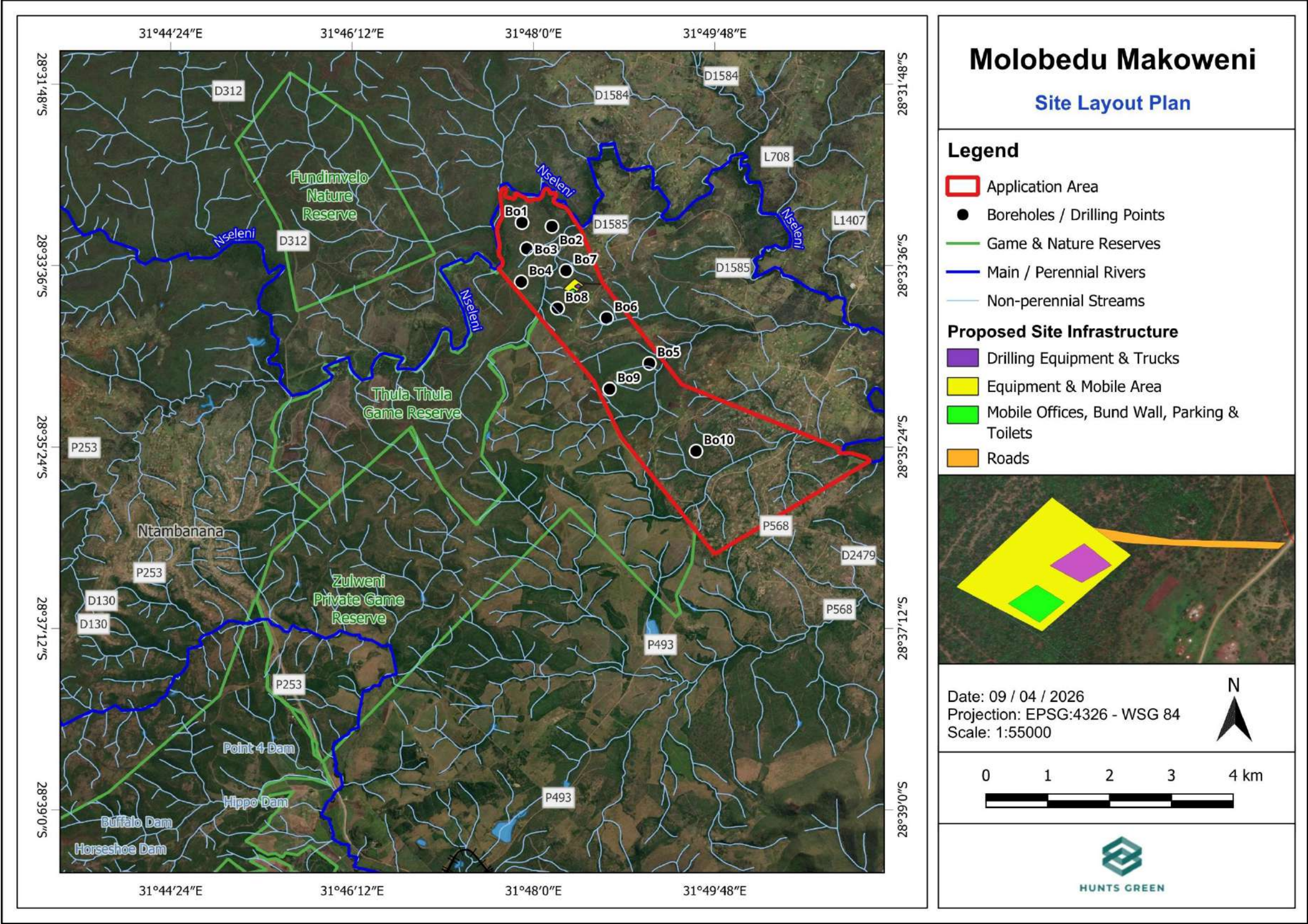


Figure 1-2: Site layout plan of the Application Area



2 Scope of Work and Methodology

The methodology adopted in this hydrological assessment is summarised below.

2.1 Desktop Assessment

The desktop assessment is invaluable in gaining an understanding of key areas that need to be focused on in the hydrological impact assessment. The objectives of the desktop assessment are to develop a better understanding of the hydrological characteristics of the project site.

2.2 Site Visit - Field Survey

A field site visit was conducted on the 14th of January 2026 to provide an understanding of the baseline environment in the area. Sampling sites were selected based on the project area and the associated water use activities within the Molobhedu site. Surface water samples were collected to obtain the baseline water quality parameters within the project area. A visual assessment of the surrounding environment was made to identify potential receptors that may be affected.

2.3 Water Sampling, Preservation and Analysis

The following sampling methodology was carried out:

- One (1) litre plastic bottles with a cap were used for sampling;
- Collected samples were stored in cooler box or fridge while on site; and
- Sample bottles were marked clearly with the site name, date of sampling, sampling depth (where relevant) and the sampler's name and submitted to a SANAS accredited laboratory.

The collected surface water samples were sent to a SANAS accredited laboratory (Talbot) for analysis. The analysis was performed for inorganic constituents.

2.4 Baseline Hydrology and Climate

Climate data obtained from the database of the Water Resources of South Africa, 2012 study (WRC, 2015) was analysed to determine the Mean Annual Precipitation (MAP),



Mean Annual Runoff (MAR) and Mean Annual Evaporation (MAE) in and around the Molobedu Makoweni area.

2.5 Hydrological Impact Assessment

The hydrological impact assessment was conducted using an assessment methodology with a set of rules (or impact categories) required to evaluate each impact for a particular risk event. Impact rating scales of Low to High were applied to each of the impact categories. The impact category in combination with the impact criteria per aspect are used to derive a final impact rating.

Impact significance measured using Significance Points (SP) was calculated for the ranked impacts using the following formula:

$$SP = (Intensity + Duration + Spatial Scale) \times Probability$$

The risk rating table (Table 2-1) is used to determine the rating score using the SP rating parameters are defined in Table 2-2.

Table 2-1: Probability Consequence Matrix for Impacts

The maximum value that can be achieved is 100 Significance Points (SP). Environmental effects were rated as follows:		
Significance	Environmental Significance Points	Colour Code
High (positive)	>60	H
Medium (positive)	30 to 60	M
Low (positive)	<30	L
Neutral	0	N
Low (negative)	>-30	L
Medium (negative)	-30 to -60	M
High (negative)	<-60	H

Table 2-2: Impact Assessment Parameter Ratings

Nature of Impact



+: Positive (A benefit to the receiving environment)

N: Neutral (No cost or benefit to the receiving environment)

-: Negative (A cost to the receiving environment)

Magnitude: =M

Duration: =D

10: Very high/don't know

5: Permanent

8: High

4: Long-term (ceases with the operational life)

6: Moderate

3: Medium-term (5-15 years)

4: Low

2: Short-term (0-5 years)

2: Minor

1: Immediate

0: Not applicable/none/negligible

0: Not applicable/none/negligible

Scale: =S

Probability: =P

5: International

5: Definite/don't know

4: National

4: Highly probable

3: Regional

3: Medium probability

2: Local

2: Low probability

1: Site only

1: Improbable

0: Not applicable/none/negligible

0: Not applicable/none/negligible



3 Legal and Administrative Framework

This specialist hydrological impact assessment was compiled in in line with;

- The Constitution Act (Act 108 of 1996), Section 24 on environmental rights;
- National Environmental Management Act (Act 107 of 1998), (NEMA) as amended;
- Environmental Impact Assessment Regulations of 2010;
- National Environmental Management Waste Act (Act 59 of 2008), (NEMWA); and
- National Water Act (Act 36 of 1998) (NWA);
- NWA amendment as per Regulation 704 (GN R 704, (1999)) on use of water for mining and related activities aimed at the protection of water resources and
- Government Notice 718 of 2009, for identified listed activities relevant to the backfilling project and the construction and operation of the required infrastructure.
- DWA Best Practice Guidelines (BPGs) series (2008).

4 Assumptions and Limitations

The following assumptions and limitations are applicable to this assessment:

- The findings, results, observations, conclusions and recommendations provided in this report are based on the author's best scientific and professional knowledge as well as available information regarding the perceived impacts on the surface water environments.
- In order to obtain definitive data regarding the hydrology and functioning of water resources, studies should ideally be conducted over several seasons and over a number of years.
- The water quality baseline assessment represents a single-season snapshot (January 2026). Seasonal variability in microbial load, salinity, and sediment transport is expected.



5 Biophysical Characteristics

5.1 Climate

According to the Köppen-Geiger climate classification, the Application Area falls within the Cfa (humid subtropical) zone, which denotes a temperate climate with no distinct dry season and a hot summer (Beck *et al.*, 2018). The Application Area is aligned with Empangeni's weather.

Empangeni experiences a humid subtropical climate marked by warm, humid summers and mild, dry winters, with an average annual rainfall of approximately 948 mm, most of which falls during the summer months. From December to March, summers are warm to hot and often humid, with frequent rainfall; January is typically one of the hottest months, with average daily highs of 29-30°C and lows around 22°C.

In contrast, winters from June to August are short, cooler, and dry, characterised by clear, sunny days; July is generally the coldest month, with night-time temperatures ranging between 11-16°C and daytime highs of about 22-23°C. The region is the coldest during July when the mercury drops to 11.3°C on average during the night. Rainfall peaks in January at roughly 121 mm and is lowest in June at approximately 34 mm (Figure 5-1).

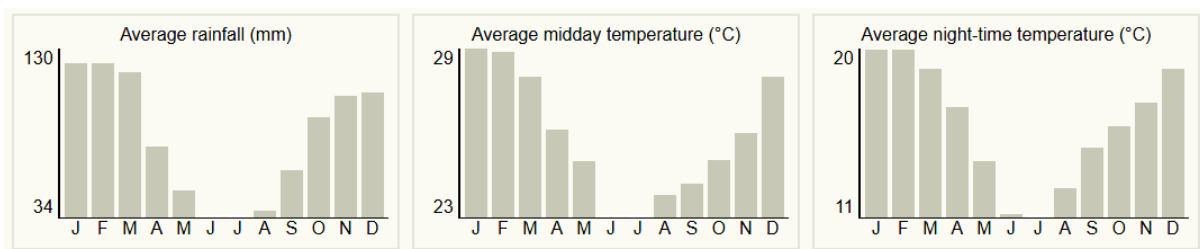


Figure 5-1: Climatic conditions of the Application Area (Source: Climate-data.org)

5.2 Geological Setting

According to the Geology Map, the Application Area is underlain by mainly the Emakwezini Formation (Pem), followed by Karoo Dolerite, Ntabene and Nyoka Formations. The geological characteristics of this formation are summarised in the Table 5-1 below, based on data from the Council for Geoscience (2019).

Table 5-1: Geology Classification (1:250K)

Rating	Management Description			
Code	Pem	J-d	Sn	Sny
Lithostratigraphic	Emakwezini Formation	Karoo Dolerite	Ntabene Formation	Nyoka Formation
Lithology	Mudrock, sandstone, minor coal seams.	Network of dolerite sills, sheets and dykes, mainly intrusive into the Karoo Supergroup.	Fine- to coarse-grained sandstone (granuly in places), subordinate mudrock.	Red mudrock and interbedded sandstones.
UQ Geology	715	70	716	717



Rating	Management Description			
UQ SACS NO	588	891	589	590
	Beaufort Group from Karoo Supergroup	Karoo Supergroup	Karoo Supergroup	Karoo Supergroup

5.3 Topography

The Application Area is positioned between 130 and 250 metres above sea level (masl). In other words, the lowest parts of the site are about 130 masl, while the highest points reach about 250 masl, indicating a vertical difference (relief) of roughly 120 m across the area. This suggests the terrain is not completely flat and likely includes gentle to moderate slopes or undulating topography.

5.4 Land Use Cover

The South African National Land Cover (SANLC) datasets provide comprehensive land cover classification for South Africa, adhering to the gazetted land-cover classification standard (SANS 19144-2). These datasets include 73 classes of information. According to the SANLC, the site has multiple primary land cover classes which are the Dense Forest and Woodland, Open Woodland, Contiguous Low Forest and Thicket, Subsistence / Small-Scale Annual Crops, Natural Grassland, Residential Formal (low veg / grass; trees; bare), Artificial Dams (including canals), Herbaceous Wetlands (previously mapped) (DFFE, 2022). The proposed Application Area is located near dense natural tree canopies, residential areas and some streams.

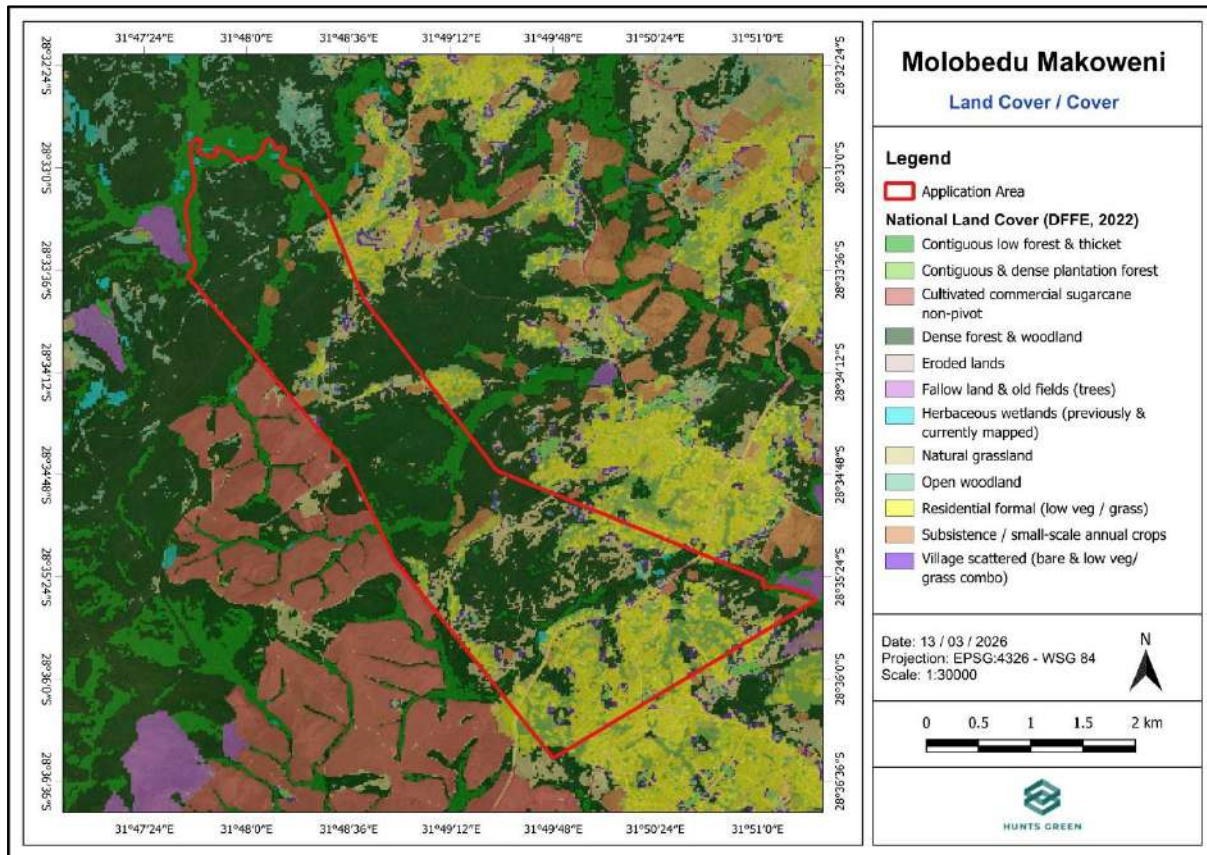


Figure 5-2: Land cover of the application area

5.5 Catchment and Riverine Characteristics

South Africa's water resources are managed through a hierarchical system of catchments, with quaternary catchments serving as the principal units at the fourth level of classification, and primary catchments grouped into Water Management Areas (WMAs). Originally, nine WMAs were established under the National Water Resource Strategy 2 (2013) in alignment with the National Water Act, 1998 (Act No. 36 of 1998). However, these were revised to six WMAs to facilitate the establishment of Catchment Management Agencies (CMAs). The updated WMA boundaries were formalised in the National Water Resource Strategy III (NWRS III), gazetted on 1 September 2023 (Gazette No. 49225, Notice No. 3855), to enhance water governance and management across the country.

The Application Area falls within primary drainage region W of the Pongola–Mtamvuna WMA and spans a single sub-quaternary drainage basin, namely W12G, as illustrated in Figure 5-3. An existing Sub-Quaternary Reach (SQR) has been identified immediately north of the proposed Application Area, bordering its northern boundary. The SQR code is W12G-03229 associated with Nseleni River. This SQR has been previously assessed. Therefore, a summary of the PES and EIS information for this main river, as provided by the Department of Water and Sanitation (DWS), is presented below.



Table 5-2: A summary of Sub-Quaternary Reaches (SQRs) information

Sub-Quaternary Reaches (SQRs)	W12G-03229
SQR Name	Nseleni River
Reach Length (km)	83.6
Ecological Importance (EI) Mean	High
Ecological Sensitivity (ES) Mean	High
Present Ecological Status (PES)	C
Stream Order	1
Default Ecological Category	B

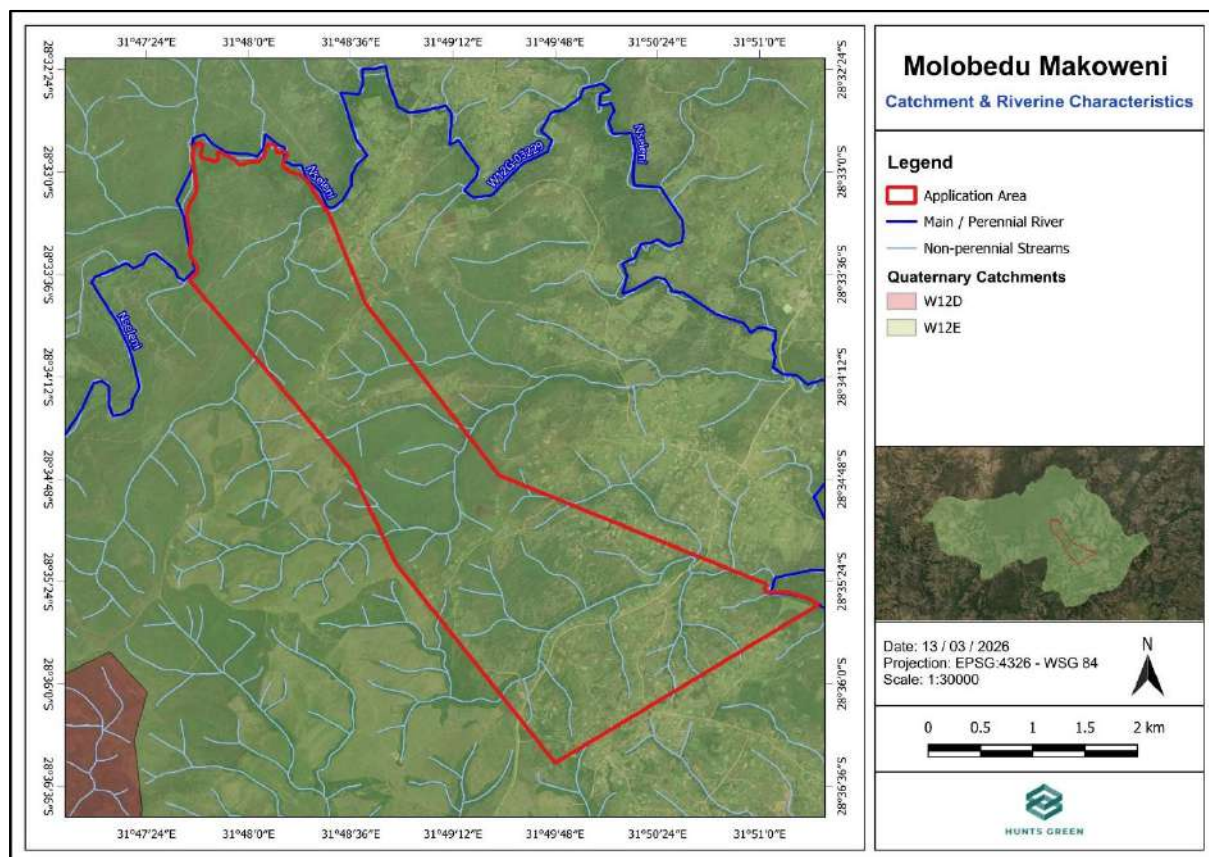


Figure 5-3: Catchment and riverine characteristics of the Application Area and surrounding areas

6 Baseline Water Quality Assessment

The baseline surface water quality assessment was undertaken to characterise existing conditions within the Molobhedu Makoweni prospecting area and to establish a reference against which potential project-related impacts may be evaluated. Two surface water samples, SW4 and SW5 (Figure 6-2), were collected during the site visit conducted on 14 January 2026, preserved appropriately, and submitted to a SANAS-accredited laboratory (Talbot) for analysis of inorganic constituents. The analytical results, attached in Appendix A, were compared against the Department of Water and Sanitation (DWS) Water Quality Guidelines for:



- Domestic use
- Aquatic ecosystem protection
- Livestock watering
- Irrigation

A summary of the laboratory results is presented in Table 6-1. The interpretation below highlights exceedances, compliance, and potential sources of concern.

Microbiological Parameters

Both sampling points show elevated microbial activity, indicating faecal contamination likely associated with upstream settlement runoff or livestock presence.

- **E. coli:** 58 counts/100 mL (SW4) and 4 counts/100 mL (SW5).
- **Total coliforms:** 2 420 colonies/100 mL (SW4) and 1 300 colonies/100 mL (SW5).
- **Standard plate count:** 700 and >1 000 counts/mL.

These values exceed the DWS domestic guideline of 0–5 colonies/100 mL for total coliforms.

Major Ions and Salinity

Salinity indicators show moderate mineralisation, with some exceedances of domestic and irrigation thresholds.

- **Electrical Conductivity (EC):**
 - SW4 = 104 mS/m
 - SW5 = 139 mS/m

Both points exceed the domestic guideline of 70 mS/m.

- **Sodium (Na):**
 - SW4 = 112 mg/L
 - SW5 = 123 mg/L

Both points exceed the irrigation guideline of 70 mg/L.

- **Chloride (Cl):**
 - SW4 = 85 mg/L (within guideline)
 - SW5 = 214 mg/L (exceeds domestic guideline)
- **Total Dissolved Solids (TDS):**
 - SW4 = 576 mg/L
 - SW5 = 710 mg/L



Both points are above the domestic threshold of 450 mg/L.

These results indicate moderate salinity stress, particularly at SW5, which may reflect localised anthropogenic inputs or natural geological contributions.

3. Nutrients

Nutrient concentrations are generally low, with no exceedances of DWS thresholds.

- **Nitrate (NO₃):** <0.025 mg/L
- **Ammonia (as N):** 2.27 mg/L at SW4

Ammonia at SW4 is elevated relative to typical background levels and may be linked to organic waste inputs, consistent with the microbial results.

4. Metals

- **Chromium (VI):** analytical detection limit (<0.013 mg/L) higher than the DWS target value (0.007 mg/L)
- **Total Chromium:** Elevated at SW4

5. Alkalinity and pH

- **P-Alkalinity:** Not detected at either site (pH < 8.3).
- **M-Alkalinity:**
 - SW4 = 371 mg/L
 - SW5 = 343 mg/L

These values indicate high buffering capacity, typical of waters draining sedimentary formations. pH values (7.9 and 8.0) fall within the DWS domestic guideline of 6.0–9.0.

6. Suspended Solids and Turbidity Indicators

Suspended solids show significant variation:

- **SW4 = 1 062 mg/L**
- **SW5 = 32 mg/L**

The extremely high suspended solids at SW4 suggest active sediment mobilisation, likely from:

- Erodible soils
- Livestock trampling
- Disturbed access tracks



- Recent rainfall events

7. Hydrocarbons

- **Oil and grease:**
- SW4 = 2 mg/L
- SW5 = 1 mg/L

Although South Africa has no numerical DWS guideline for oil and grease, the presence of measurable hydrocarbons indicates anthropogenic influence, potentially from:

- Vehicle movement
- Informal washing areas
- Agricultural machinery

This supports the need for strict hydrocarbon management during prospecting.

Overall, the baseline water quality reflects a moderately impacted system, with key concerns including:

Primary concerns

- High microbial contamination (SW4 and SW5)
- Elevated suspended solids (SW4)
- Elevated salinity indicators (EC, Na, Cl)
- Presence of oil and grease

Secondary concerns

- Elevated ammonia at SW4
- High alkalinity (natural geological influence)

The water quality shows signs of catchment-level anthropogenic influence but remains within acceptable limits for most livestock and aquatic ecosystem parameters.

This baseline provides a robust reference for assessing potential hydrological and water quality impacts associated with the proposed prospecting activities. Given that the Nseleni River SQR has High EI and ES, maintaining baseline water quality is critical.

Given that prospecting activities will occur intermittently over a five-year period and do not involve continuous discharge or large-scale earthworks, bi-annual monitoring frequency is considered sufficient and proportionate to the associated water-quality risks. Monitoring during both the wet and dry seasons will capture the full range of natural hydrological variability, enabling the detection of any project-related trends in salinity, sediment load, microbial contamination, hydrocarbons, and geochemical stability. This frequency aligns with the DWS



Best Practice Guidelines, which recommend monitoring commensurate with the scale and risk of the activity.

Figure 6-1: Site observations in the sampled surface water points

Site	GPS	Site Description	Site Photograph
SW4	28°33'22.40"S 31°48'17.61"E	• The stream was dry with a very small pool of water • Standing water • Sparsely vegetated banks • Brown water	
SW5	28°33'13.47"S 31°48'29.29"E	• River was mainly dry with a pool of water • Standing water • Well vegetated banks • Clear water with algae • Animal footprints were observed	



HUNTS GREEN

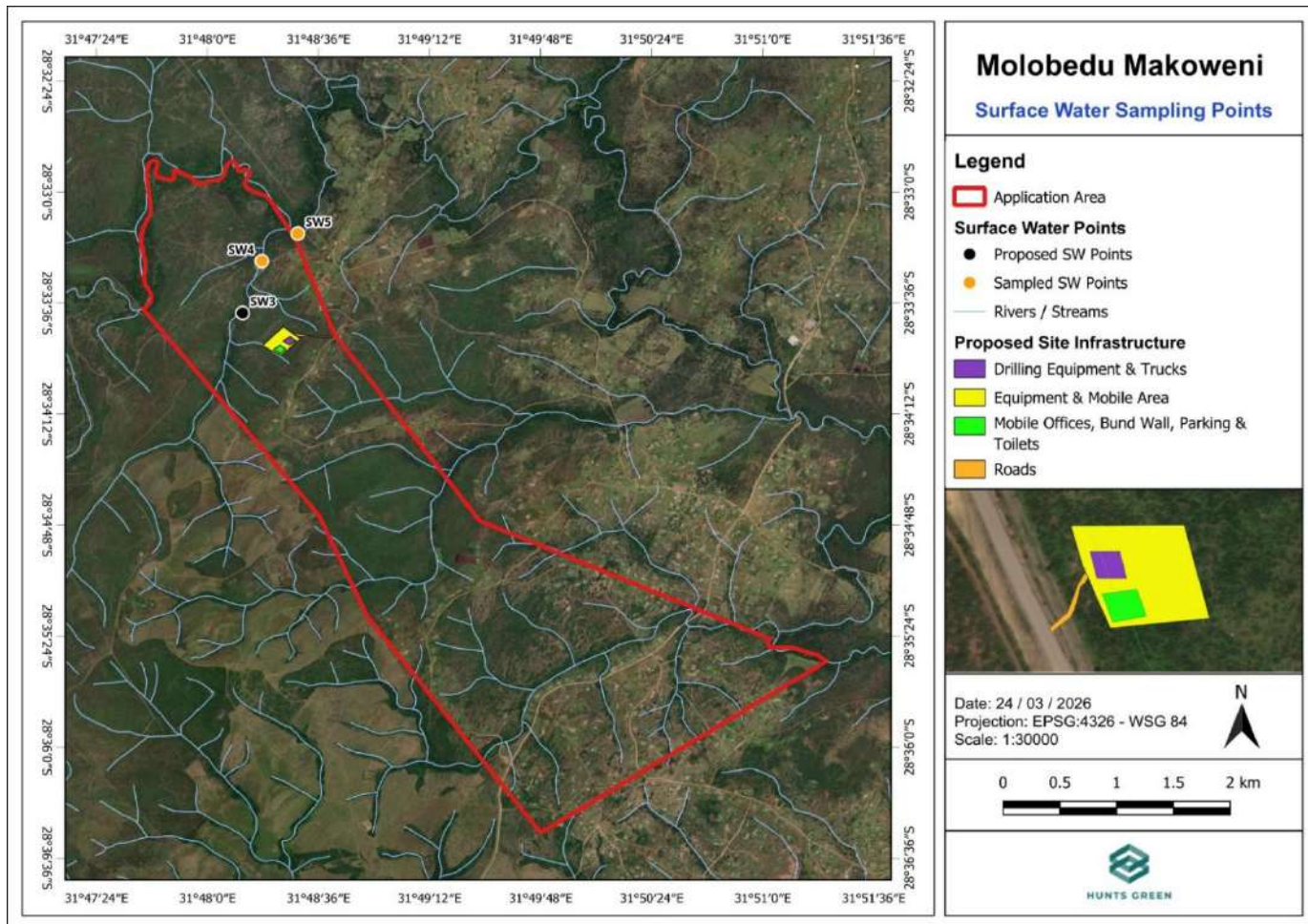


Figure 6-2: Proposed and Sampled Surface Water Points



Table 6-1: Summary of Laboratory Results for the sampled points SW4 and SW5

Analyte	Unit	DWS Domestic Use	DWS Aquatic Ecosystem	DWS Livestock Watering	DWS Irrigation	SW4	SW5
<i>E. coli</i>	counts/100ml	NS	NS	NS	NS	58	4
Total Coliforms	colonies/100ml	0-5	NS	NS	NS	2420	1300
Standard plate count	counts/1m	100	NS	NS	NS	700	>1000
Ammonia as N	mg/l	NS	NS	NS	NS	2.27	<1
Chloride Cl	mg/l	<100	NS	<1500	<100	85	214
Nitrate NO ₃	mg/l	<6	NS	<200	100	<1	<1
Nitrate NO ₃ as N	mg/l	<6	NS	NS	<10	<0.025	<0.025
Sulphate SO ₄	mg/l	<200	NS	<1000	NS	9.47	25
Ca	mg/l	<32	NS	<1000	NS	33	55
K	mg/l	<50	NS	NS	NS	12	7.69
Mg	mg/l	<30	NS	<500	NS	24	47
Na	mg/l	<100	NS	<2000	<70	112	123
Cr (VI)	mg/l	<0.05	0.007	<1	<0.1	<0.013	<0.013
P	mg/l	NS	NS	NS	NS	0.1	0.2
Electrical Conductivity	mS/m	<70	NS	NS	40	104	139
P Alkalinity	mg/l CaCO ₃	NS	NS	NS	NS	pH <8.3, No p - Alkalinity detected	pH <8.3, No p - Alkalinity detected
Total (M) Alkalinity	mg/l CaCO ₃	NS	NS	NS	NS	371	343
pH		6.0 - 9.0	NS	NS	6.5 - 8.4	7.9	8.0
Total Cr as Cr (III)	mg/l	NS	<0.012	NS	NS	40	<10
Total Dissolved Solids at 180°C	mg/l	<450	NS	<1000	NS	576	710
Suspended Solids at 105°C	mg/l	NS	NS	NS	NS	1062	32
Hg	mg/l	<1	0.04	<1	NS	<5	<5
Oil and grease	mg/l	NS	NS	NS	NS	2	1
Key							
Exceeds either the DWS standards for domestic, aquatic ecosystem, livestock watering and irrigation water uses							
Exceeds more than one of the DWS standards for domestic, aquatic ecosystem, livestock watering and irrigation water uses							
No Standard						NS	

7 Impact and Risk Assessment

The hydrological impact assessment was conducted for activities associated with the site establishment, operational and decommissioning phases. Descriptions of identified impacts, their significance ratings and proposed mitigation measures are presented in this Section.

Activities that Could Potentially Affect Surface Water Resources:

- Site establishment:
 - Site Clearing
 - Excavation during the construction of the proposed infrastructure
 - Storage of fuel (including hydrocarbon spills), lubricants and explosives in temporary facilities.
- Operational:
 - Offices, change house, and ablution facilities;
 - Hydrocarbons from equipment and machinery;
 - On site storage of waste materials.
 - Cleaning, repair and maintenance activities;
 - Dust suppression water management; and
 - Sewage and domestic waste storage.
- Post-Closure:
 - Civil works and materials movement;
 - Removal or cleaning of the bulk material's handling infrastructure;
 - Removal and cleaning of the product and waste handling infrastructure;
 - Rehabilitation of the footprints of the surface infrastructure; and

7.1 Site Establishment Phase

Activities during the site establishment phase that may have potential impacts on the surface water resources are described and the appropriate management/mitigation measures are provided below.

Table 7-1: Interactions and Impacts of Activity

Interaction	Impact
Site clearing	Increased surface runoff and reduced rainfall recharge due to vegetation clearance. Runoff causing siltation of surface water resources, increasing turbidity leading to deteriorated water quality.
Excavation during the site establishment stage	Site clearing activities that would involve excavation below the water table depth may have a potential impact on the water quantity and quality. Lowering of the water table, if the construction activities are going to take place below the water table. This may likely reduce baseflow, impacting on receiving water courses and groundwater dependent ecosystems like wetlands as they are mainly in low lying areas of the catchment. Contamination of runoff emanating from the construction areas.
Storage of fuel, lubricants and explosives in temporary facilities.	Water quality contamination and deterioration.

7.1.1 Impact Description: Surface Water Resources and Quality

Clearing or removal of vegetation exposes the surface and leaves the soils prone to erosion during rainfall events and as a result, runoff from these areas (which will be high in suspended solids and sediments) can lead to increased Total Suspended Solids and sedimentation in the nearby watercourses.

Dirty or contaminated runoff emanating from site establishment activities, such as the cement mixing areas, fuel storage areas, other liquid waste and general waste have the potential to contaminate the nearby watercourses.

The storage of hydrocarbons and hazardous materials may cause direct impacts to the water and wetland resources within the study area and surrounding wetland areas. The contamination of water resources will result in the deterioration of water quality which will impact on aquatic faunal species, terrestrial faunal species and vegetation.

Human activity will generate waste which includes general wastes (paper, glass, plastic and cans) and biological sewage waste that may be either exposed or spilled during construction. The handling and disposal of such waste must be managed appropriately, as this poses a risk to the water resources if not managed appropriately.

7.1.2 Management/ Mitigation Measures

The following mitigation measures are recommended:

- Clearing of vegetation must be limited to the development footprint.
- All storage areas (fuels, paints, chemicals, etc.) should be appropriately bunded and spill kits should be in place, and construction workers trained in the use of spill kits, to contain and immediately clean up any potential leakages or spills.
- Ensure that all oil changes, refuelling and lubrication of equipment's is done away from the waterbody and in a manner such that any spillage will not enter the waterbody.
- An Environmental Control Officer (ECO) should ensure implementation of the recommended mitigation/management measures during construction.

Table 7-2: Impact significance rating for the construction phase: Site Clearing/Excavation

Impact: Site Clearing/Excavation			
Dimension	Rating	Motivation	Significance
Duration	2	The impact may only occur during site establishment	44-Moderate (negative)
Intensity	6	This will have minor to medium-term intensity resulting in reduction of proximal recharge potential and lowering water level	
Spatial scale	3	The impacts will be localized	
Probability	4	Without appropriate mitigation, it is probable that this impact will occur	
Post-mitigation			
Duration	2	The impact will likely occur during the construction phase only	16-Negligible (negative)
Intensity	3	Should the impact occur, it will have minor medium-term impacts resulting in a reduction in water level locally or reduced recharge.	
Spatial scale	3	The impacts will be localised	
Probability	2	With mitigation measures in place. It will be rare/improbable for this impact to occur.	

Table 7-3: Impact significance rating for the construction phase: Water Contamination (spillage, leakage, oil spills)

Impact: Water Contamination (spillage, leakage, oil spills)			



Dimension	Rating	Motivation	Significance
Duration	2	The impact will likely only occur during the construction phase	40- Moderate (negative)
Intensity	4	This will moderately impact the water quality and the ecosystem functionality for downstream users	
Spatial scale	4	The impacts may extend in the greater surrounding area from where the impact occurred	
Probability	4	Without appropriate mitigation, it is probable that this impact will occur	
Post-mitigation			
Duration	2	The impact will likely only occur during the construction phase	20-Negligible (negative)
Intensity	4	This will moderately impact the water quality and the ecosystem functionality for downstream users	
Spatial scale	4	The impacts may extend in the greater surrounding area from where the impact occurred	
Probability	2	With mitigation measures in place. It will be rare/improbable for this impact to occur.	

7.2 Operational Phase

Activities during the operational phase that may have potential impacts on the surface water resources are described and the appropriate management/mitigation measures are provided below in Table 7-4.

Table 7-4: Interactions and Impacts of Activity

Interaction	Impact
Runoff from contaminated areas and any dirty water discharges into nearby watercourses	In-stream water quality deterioration.
Hydrocarbon and chemical spillages and leakages from equipment and machinery	Water quality contamination and deterioration.

7.2.1 Impact Description

7.2.1.1 Impact Description: Water Contamination from runoff from dirty water areas

Water contamination may occur as a result of runoff or overflows from polluted areas (such as domestic waste, sewage, waste storage areas). Contamination of surface water resources will lead to the deterioration of water quality affecting aquatic ecosystems and downstream water

7.2.1.2 Impact Description: Water Contamination from fuels and chemical spillages and leakages from equipment and machinery

Operational machinery at the site are potential sources of hydrocarbon and chemical spills and leakages. When not properly managed hydrocarbon and chemical spills and leakages will contaminate surface and groundwater resources.

7.2.2 Management/ Mitigation Measures

The following mitigation measures are recommended:

- The following management activities can be implemented to minimise contamination from on-site activities:
 - Implementation of adequate storm water management to contain all wastewater and/ or volatile organic compounds, for treatment and recycling.
- Implementation of the commission pollution preparedness contingency plan.
- Continue monitoring across the site to monitor the changes in water quality upstream and downstream.
- Vehicles must only be serviced within designated service bays.
- The management of general and other forms of waste must ensure collection and disposal into clearly marked skip bins that can be collected by approved contractors for disposal to the appropriate disposal sites;
- The hydrocarbon and chemical storage areas and facilities must be located on a hard-standing area (paved or concrete surface that is impermeable), roofed and bunded in accordance with SANS1200 specifications. This will prevent mobilisation of leaked hazardous substances.

Table 7-5: Impact significance rating for the construction phase: Water contamination from runoff from dirty water areas

Impact: Water Contamination caused by runoff from dirty water areas			



Dimension	Rating	Motivation	Significance
Duration	7	The impact will likely occur for the duration of the operational phase	60- Moderate (negative)
Intensity	4	This will moderately impact the water quality and the ecosystem functionality for downstream users	
Spatial scale	4	The impacts may extend to the greater surrounding areas from where the impact occurred	
Probability	4	Without appropriate mitigation, it is probable that this impact will occur	
Post-mitigation			
Duration	3	The impact will likely only occur during the operational phase. The impact will only likely persist in the absence of proper implementation of pollution controls.	14-Negligible (negative)
Intensity	2	This will moderately impact the water quality and the ecosystem functionality for downstream users.	
Spatial scale	2	The impacts will be localised to the nearby watercourses and to the immediate downstream water users.	
Probability	2	With mitigation measures place. It will be rare/improbable for this impact to occur.	

Table 7-6: Impact significance rating for the construction phase: Water Contamination from hydrocarbon and chemical spillages and leakages

Impact: Water Contamination from hydrocarbon and chemical spillages and leakages			
Dimension	Rating	Motivation	Significance
Duration	2	The impact will likely occur for the duration of the project life	36- Moderate (negative)
Intensity	4	This will moderately impact the water quality and the ecosystem functionality for downstream users	
Spatial scale	3	The impacts will be localised to the immediate surroundings of the site.	
Probability	4	Without appropriate mitigation, it is probable that this impact will occur	
Post-mitigation			

Duration	2	The impact will likely only occur during the operational phase.	10-Negligible (negative)
Intensity	1	With proper management of hydrocarbon and chemicals on site the impact will rarely be of significance and water quality in nearby watercourses will be maintained for optimal functionality of ecosystems and downstream	
Spatial scale	2	With proper management, the impacts will be localised to the nearby watercourses and to the immediate downstream water users.	
Probability	2	With mitigation measures place. It will be rare/improbable for this impact to occur.	

7.3 Rehabilitation, Decommissioning and Post-Closure Phase

The closure phase is characterised by the cessation of all activities and decommissioning of the infrastructure.

Activities during the decommissioning phase that may have potential impacts on the surface water resources are described and the appropriate management/mitigation measures are provided below in Table 7-7.

Table 7-7: Interactions and Impacts of Activity

Interaction	Impact
Sedimentation and siltation of nearby watercourses resulting from demolition of infrastructure and subsequent disturbance of soils.	In-stream water quality deterioration.
Hydrocarbon and chemical spillages and leakages from equipment and machinery	Water quality contamination and deterioration.

7.3.1 Impact Description

7.3.1.1 Impact Description: In-stream water quantity and quality deterioration from sedimentation and siltation of nearby watercourses

During the decommissioning phase, the demolition of infrastructure will cause disturbance and subsequent erosion of soils into nearby watercourses.

This will result in the sedimentation and siltation of watercourses and dams thereby reducing

their flow/storage capacities and their ability to sustain aquatic ecosystems. The quantity and quality of water for downstream water users might be compromised if these risks are not adequately managed.

7.3.1.2 Impact Description: Water Contamination from fuels and chemical spillages and leakages from equipment and machinery

Operational machinery during closure at the site are potential sources of hydrocarbon and chemical spills and leakages. When not properly managed hydrocarbon and chemical spills and leakages will contaminate surface and groundwater resources in proximity to the site.

7.3.2 Management/Mitigation Measures

The following mitigation measures are recommended:

- Disturbance of soils during infrastructure removal should be restricted to relevant footprint areas;
- Movement of machinery and vehicles should be restricted to designated access roads to minimise the extent of soil disturbance;
- Vehicles must only be serviced within designated service bays.
- The hydrocarbon and chemical storage areas and facilities must be located on a hard-standing area (paved or concrete surface that is impermeable), roofed and bunded in accordance with SANS1200 specifications. This will prevent mobilisation of leaked hazardous substances.
- Continue monitoring across the site to monitoring the changes in water quality change upstream and downstream.

Table 7-8: Impact significance rating for the construction phase: In-stream water quantity and quality deterioration from sedimentation and siltation of nearby watercourses

Impact: In-stream water quantity and quality deterioration from sedimentation and siltation of nearby watercourses			
Dimension	Rating	Motivation	Significance
Duration	7	The impact will only likely occur when there demolition of infrastructure during the decommissioning phase.	60- Moderate (negative)
Intensity	4	This will have minor to medium-term intensity resulting in reduction of proximal watercourse flow capacity and poor water quality for immediate downstream users and the aquatic life	



Spatial scale	4	The impacts will be localised to the nearby watercourses from where the silt is being generated to the immediate downstream	
Probability	4	Without appropriate mitigation, it is probable that this impact will occur	
Post-mitigation			
Duration	2	The impact will likely only occur during the decommissioning phase	6-Negligible (negative)
Intensity	2	This will have minor to medium-term intensity resulting in reduction of proximal watercourse flow capacity and poor water quality for immediate downstream users and the aquatic life	
Spatial scale	2	The impacts will be localised to the nearby watercourses and to the immediate downstream water users.	
Probability	1	With mitigation measures place. It will be rare/improbable for this impact to occur.	

Table 7-9: Impact significance rating for the construction phase: Water Contamination from fuels and chemical spillages and leakages from equipment and machinery

Impact: Water Contamination from hydrocarbon and chemical spillages and leakages			
Dimension	Rating	Motivation	Significance
Duration	2	The impact will likely occur for the duration of the project life	36- Moderate (negative)
Intensity	4	This will moderately impact the water quality and the ecosystem functionality for downstream users	
Spatial scale	3	The impacts will be localised to the immediate surroundings of the site.	
Probability	4	Without appropriate mitigation, it is probable that this impact will occur	
Post-mitigation			
Duration	2	The impact will likely only occur during the operational phase. The impact will only likely persist in the absence of proper monitoring and maintenance of storm water management plan infrastructure on site.	4-Negligible (negative)
Intensity	1	With proper management of hydrocarbon and chemicals on site the impact will rarely	



		be of significance and water quality in nearby watercourses will be maintained for optimal functionality of ecosystems and downstream	
Spatial scale	2	With proper management, the impacts will be localised to the nearby watercourses and to the immediate downstream water users.	
Probability	1	With mitigation measures place. It will be rare/improbable for this impact to occur.	



8 Cumulative Impacts

The assessment of cumulative impacts considers how the proposed prospecting activities, when combined with existing land uses and environmental pressures within the broader catchment, may collectively influence surface water resources, hydrological processes, and water quality over time. According to the SANLC, the site has multiple primary land cover classes which are the Dense Forest and Woodland, Open Woodland, Contiguous Low Forest and Thicket, Subsistence / Small-Scale Annual Crops, Natural Grassland, Residential Formal (low veg / grass; trees; bare), Artificial Dams (including canals), Herbaceous Wetlands (previously mapped) (DFFE, 2022). The proposed Application Area is located near dense natural tree canopies, residential areas and some streams. These diverse land uses already exert varying degrees of pressure on the hydrological system.

The application area falls within the W12G sub-quaternary catchment, immediately south of the Nseleni River, which has High Ecological Importance and High Ecological Sensitivity, with a Present Ecological Status of Category C (moderately modified). This indicates that the receiving environment is already under measurable pressure from:

- Upstream settlements contributing microbial contamination
- Agricultural activities contributing sediment and nutrient loads
- Existing access tracks and disturbed soils
- Natural salinity from geological formations
- Localised hydrocarbon inputs
- These pressures are reflected in the baseline water quality results, which show elevated *E. coli*, total coliforms, TDS, EC, sodium, chloride, and suspended solids, as well as detectable oil and grease at both sampling points.

Although the prospecting activities are temporary and intermittent, the project introduces additional pressures that may interact cumulatively with existing catchment stressors, such as cumulative water quality deterioration if wastewater, sewage, hydrocarbons, or contaminated runoff are not adequately managed. Given that baseline conditions already exceed several DWS thresholds, even small incremental contributions could push the system further from its ecological management objectives.

The catchment already exhibits signs of erosion and sediment mobilisation, particularly at SW4 where suspended solids reached 1 062 mg/L. Vegetation clearance, soil disturbance, and access road use during prospecting could cumulatively increase:

- Sediment delivery to nearby streams
- Turbidity and reduced light penetration
- Habitat degradation for aquatic biota



Hydrocarbon traces (1–2 mg/L) were detected in baseline samples, indicating existing anthropogenic influence. Additional machinery, fuel storage, and vehicle movement may cumulatively increase the risk of:

- Hydrocarbon contamination
- Acute spill events during site establishment, storage or decommissioning

Without mitigation, cumulative impacts on surface water resources are assessed as Moderate to High (negative) due to, but with full implementation of mitigation measures—including bunding, stormwater controls, spill response, waste management, and ongoing monitoring—the cumulative impact significance is reduced to Low to Negligible (negative).

The proposed mitigation measures to reduce cumulative effects are:

- Strict implementation of the Pollution Prevention Contingency Plan
- Bunded, roofed hydrocarbon storage areas
- Weekly inspection of machinery for leaks
- Stormwater separation (clean vs dirty water)
- Erosion and sediment control during all phases
- Twice-annual water quality monitoring (wet and dry seasons)
- Immediate spill response and contaminated soil removal
- Restricting disturbance to the designated footprint
- Submit monitoring results and rehabilitation progress to the relevant authorities as required under NEMA and the MPRDA

When considered alongside existing land uses and environmental pressures, the proposed prospecting activities have the potential to contribute cumulatively to water quality deterioration, sedimentation, and hydrocarbon contamination. However, due to the temporary nature, and non-excavation-intensive character of the prospecting activities, and provided that all mitigation measures are rigorously implemented, cumulative impacts are expected to remain Low to Negligible and manageable within the ecological thresholds of the receiving environment.



9 Unplanned Events and Low Risks

The potential risks or unplanned events involve accidental spillages of hazardous substances from waste storage facilities into adjacent surroundings during the operation phase. This may lead to impacts on water quality in the surrounding streams, should runoff from these contaminated areas enter the system.

The unplanned events that may happen at the project site and the proposed mitigation actions are listed in Table 9-1.

Table 9-1: Unplanned Events, Low Risks and their Management Measures

Unplanned event	Potential impact	Mitigation / Management / Monitoring
Hydrocarbon spills from storage tanks, vehicles and heavy machinery or hazardous materials or waste storage facilities	Hydrocarbon contamination of water resources	- Hydrocarbons and hazardous materials must be stored in bunded areas and refuelling should take place in contained areas; - Ensure that oil and silt traps are well maintained; - Vehicles and heavy machinery should be serviced and checked in a demarcated area on a regularly basis to prevent leakages and spills; - Hydrocarbon spill kits must be available on site at all locations where hydrocarbon spills could take place; - If a considerable amount of fluid is accidentally spilled, the contaminated soil should be scraped off and disposed of at an acceptable dumping facility. The excavation should be backfilled with soil of good quality. - An emergency spillage response plan and spill kits should be in place and accessible to the responsible monitoring team in case of bursting accidents. - The Material Safety Data Sheets (MSDS) should be kept on site for the Life of Project for anytime reference in terms of best practice



Spills / leaks	Contamination of surface water and groundwater	- Regular inspections of pipelines for any leaks. Seeping pipelines should be sealed; and - The stormwater structures will contain the dirty water and direct the clean water to the streams. The stormwater infrastructure should be maintained to ensure optimal usage.

10 Surface Water Management and Monitoring Plan

Surface water monitoring should be continued to detect negative impacts as they arise and to ensure that the necessary mitigation measures are implemented. All water quality results should be benchmarked to relevant water quality objectives to determine any impact on the quality of water (positive/negative). Samples should be collected by using best practice guidelines and should be analysed by a SANAS accredited laboratory.

10.1 Water Sampling and Preservation

When sampling the following procedures are proposed:

- One (1) litre plastic bottles with a cap are required for the sampling exercises;
- Glass bottles are required if organic constituents are to be tested;
- Collected samples must be stored in cooler box or fridge while on site; and
- Sample bottles should be marked clearly with the name, date of sampling, sampling depth and the sampler's name and submitted to a SANAS accredited laboratory.

10.2 Parameters to be monitored

The surface water monitoring plan is summarised as follows:

**Table 10-1: Surface Water Monitoring Plan**

Monitoring Element	Comment	Frequency	Responsibility
Water quality	Ensure water quality monitoring as per existing monitoring programme. Parameters should include but not limited to; pH, Electrical Conductivity, Cyanide, Aluminium, Arsenic, hydrocarbons, Sulphates, Phosphates (Orthophosphates as P), Iron, Manganese, Calcium, Magnesium, Nitrate, Ammonia, Fluoride, Chloride, Cadmium, Lead, Selenium, Total dissolved solids, Suspended Solids, Sodium, Potassium, Chemical Oxygen Demand and E. Coli (per 100ml).	-Monthly during Construction/site establishment and bi-annually during the operational phase -Monitoring needs to carry on one year after the project has ceased, as is standard practice to detect residual impacts.	Environmental Officer

10.3 Proposed Monitoring Points

Surface water monitoring should be continued to detect negative impacts as they arise and to ensure that the necessary mitigation measures are implemented. The monitoring points in Figure 10-1 are proposed, assuming they are accessible. SW3 was removed as a proposed monitoring point since it was not accessible for sampling during the site visit.



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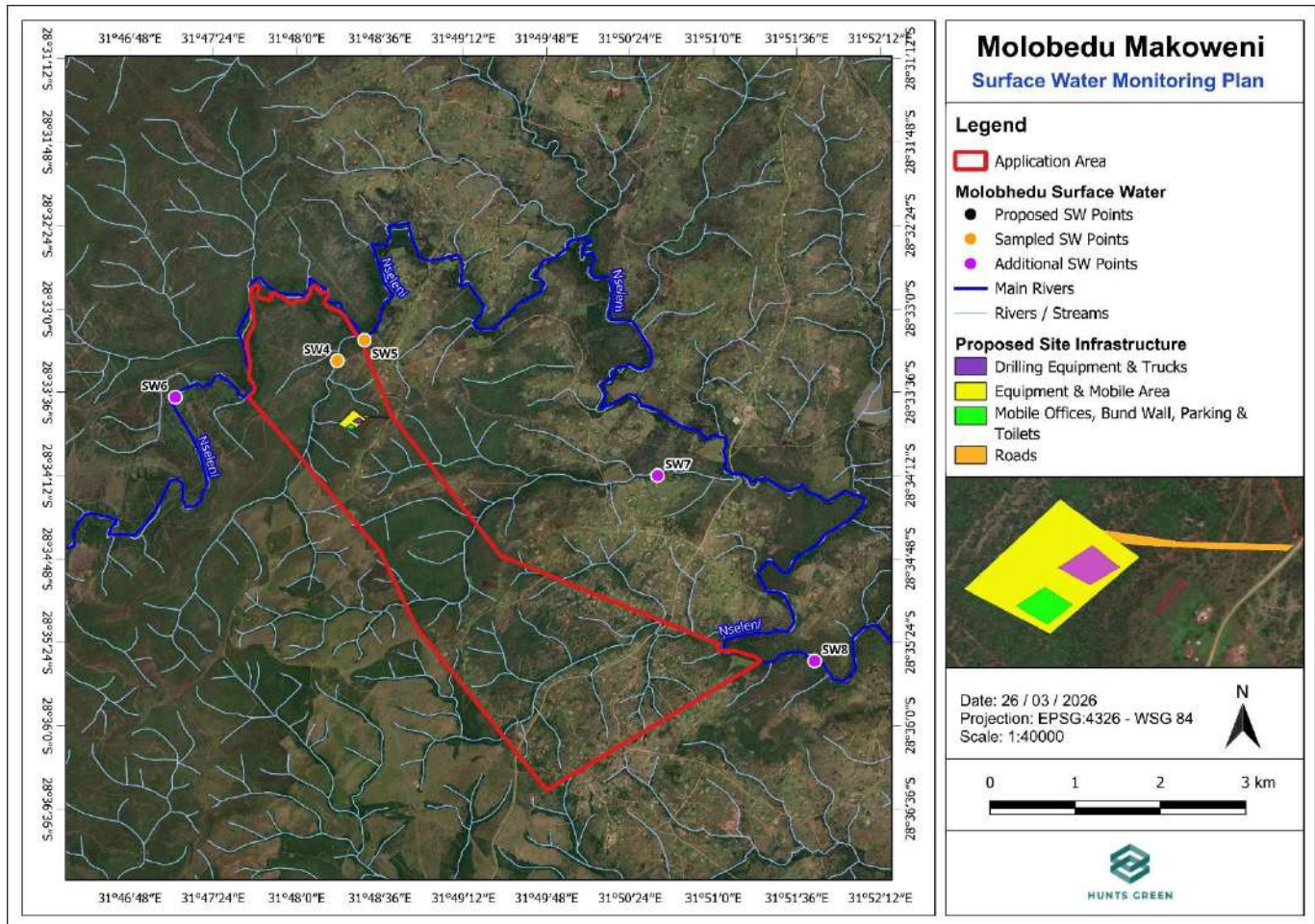


Figure 10-1: Proposed Surface Water Monitoring Points

Table 10-2: Coordinates of the proposed surface water monitoring points

Site	Latitude	Longitude	Site Description
SW4	-28.556221°	31.804892°	Situated in non-perennial stream, immediately downstream of the proposed site infrastructure
SW5	-28.553740°	31.808137°	Situated in non-perennial stream, downstream of the proposed site infrastructure
SW6	-28.560594°	31.785463°	Upstream point of the overall application area
SW7	-28.569995°	31.843309°	Situated in a perennial tributary
SW8	-28.592230°	31.862153°	Downstream point of the overall application area



11 Conclusions and Recommendations

The proposed prospecting activities on Lot 289 Empangeni 13389 GU and Lot 285 Empangeni 13400 GU are characterised by a temporary duration, and limited hydrological disturbance, as confirmed through desktop analysis, field investigation, and baseline water quality sampling. The site falls within the W12G sub-quaternary catchment, adjacent to the Nseleni River, which has High Ecological Importance and Sensitivity. Baseline water quality results indicate existing pressures in the catchment, including elevated microbial loads, suspended solids, salinity, and traces of hydrocarbons.

Prospecting activities do not involve large-scale excavation, dewatering, or permanent infrastructure, and therefore pose low inherent hydrological risk. Potential impacts relate primarily to hydrocarbon spills, contaminated runoff, localised sediment mobilisation, and poor waste handling. With appropriate mitigation, these impacts can be effectively managed and reduced to Low significance.

Cumulative impacts, when considered alongside existing land uses and catchment pressures, remain manageable, provided that mitigation measures and monitoring commitments are fully implemented.

Overall, the project is hydrologically feasible, and no fatal flaws were identified.

To ensure protection of surface water resources and compliance with the National Water Act and DWS Best Practice Guidelines, the following recommendations are made:

- Implement the Pollution Prevention Contingency Plan in full, with emphasis on spill prevention, containment, and rapid response.
- Store all hydrocarbons in bunded, roofed areas.
- Conduct weekly inspections of machinery, fuel storage, and drip trays to prevent leaks.
- Limit disturbance strictly to the designated footprint.
- Rehabilitate drill pads, access tracks, and disturbed areas immediately after use, ensuring re-vegetation and erosion control.
- Remove all waste, contaminated soil, and temporary infrastructure from site.
- Conduct one year of post-closure surface water quality monitoring, covering both wet and dry seasons, to confirm that no residual impacts persist.
- Monitor key parameters identified during baseline sampling, including microbial indicators, suspended solids, salinity, and hydrocarbons.
- Trigger corrective action if exceedances above baseline or guideline values are detected.
- Maintain detailed records of all monitoring, inspections, and incidents.
- Submit monitoring results and rehabilitation progress to the relevant authorities as required under NEMA and the MPRDA.



11.1 Reasoned Opinion of the Specialist

Based on the findings of the desktop assessment, field investigation, baseline water quality analysis, and hydrological impact assessment, it is the specialist's reasoned opinion that the proposed prospecting activities on Lot 289 Empangeni 13389 GU and Lot 285 Empangeni 13400 GU can proceed without causing significant or irreversible impacts to surface water resources, provided that the recommended mitigation measures are fully implemented as detailed in this report.

There are no hydrological fatal flaws associated with the proposed prospecting right application. The project is considered environmentally acceptable from a hydrological perspective, subject to full compliance with the mitigation measures and monitoring requirements outlined in this report.



12 Details of Specialist

This Specialist Report has been compiled by the following specialists:

Table 12-1: Details of the Specialist(s) who prepared this Report

Responsibility	Technical Reviewer
Full Name of Specialist	Lungile Lembede
Highest Qualification	MSc Hydrology
Professional Registration	125677 (Professional Natural Scientist)
Years of experience in specialist field	>9

Declaration of the Specialist

I, **Lungile Lembede**, as the appointed specialists hereby declare/affirm the correctness of the information provided or to be provided as part of the application, and that I:

- in terms of the general requirement to be independent:
- other than fair remuneration for work performed/to be performed in terms of this application, have no business, financial, personal or other interest in the activity or application and that there are no circumstances that may compromise my objectivity; or
- am not independent, but another specialist that meets the general requirements set out in Regulation 13 have been appointed to review my work (Note: a declaration by the review specialist must be submitted);
- in terms of the remainder of the general requirements for a specialist, am fully aware of and meet all of the requirements and that failure to comply with any the requirements may result in disqualification;
- have disclosed/will disclose, to the applicant, the Department and interested and affected parties, all material information that have or may have the potential to influence the decision of the Department or the objectivity of any report, plan or document prepared or to be prepared as part of the application;
- have ensured/will ensure that information containing all relevant facts in respect of the application was/will be distributed or was/will be made available to interested and affected parties and the public and that participation by interested and affected parties was/will be facilitated in such a manner that all interested and affected parties were/will be provided with a reasonable opportunity to participate and to provide comments;



- have ensured/will ensure that the comments of all interested and affected parties were/will be considered, recorded and submitted to the Department in respect of the application;
- have ensured/will ensure the inclusion of inputs and recommendations from the specialist reports in respect of the application, where relevant;
- have kept/will keep a register of all interested and affected parties that participate/d in the public participation process; and
- I am aware that a false declaration is an offence in terms of regulation 48 of the 2014 NEMA EIA Regulations.

Lungile Lembede

Signature of the Specialist

Lungile Lembede

Full Name and Surname of the Specialist

Hunts Green Consulting

Name of Company

18th of March 2026

Date



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Client: Vahlengwe Mining Advisory and Consulting (Pty) Ltd

Report Title: HYDROLOGICAL IMPACT ASSESSMENT IN SUPPORT OF THE PROSPECTING RIGHT APPLICATION OF COAL ON LOT 289 EMPANGENI 13389 GU AND LOT 285 EMPANGENI 13400 GU IN KING CETSHWAYO DISTRICT MUNICIPALITY, KWA-ZULU NATAL PROVINCE

Document Number: HG01-00-GEN-2026.01.27-r1-REP-VAH118



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14 Appendix A: Lab Results



[001132/26], [2026/03/02]

Certificate of Analysis

Project details

Customer Details

Invoice Category	400.001
Customer reference:	VAHLENGWE-MOLOBHEDU
Company name:	HUNTS GREEN
Contact address:	170 KENNETH ROAD, RANDFONTEIN, JOHANNESBURG, 1759
Contact person:	LUNGILE LEMBEDE

Sampling Details

Sampled by:	CUSTOMER
Sampled date:	2026/02/10

Sample Details

Sample type(s):	RIVER WATER SAMPLES
Date received:	2026/02/13
Delivered by:	COURIER SERVICE
Sample condition:	INCORRECT BOTTLE TYPE, SPLIT SAMPLE MADE
Temperature at sample receipt (°C):	29.3
Deviations:	004284/26,004283/26 - Inappropriate bottle type submitted for bacteriological testing. Inappropriate bottle type submitted for organics/Oil & Grease, Insufficient volume provided

Report Details

Testing commenced:	2026/02/13
Testing completed:	2026/03/02
Report date:	2026/03/02
Our reference:	001132/26



Analytical Results

Methods	Determinands	Units	004283/26	004284/26
			SW4 10.02.2026	SW5 10.02.2026
Chemical				
93	Total Calcium	mg Ca/l	40	55
93	Total Magnesium	mg Mg/l	30	47
93	Total Potassium	mg K/l	14.9	7.80
93	Total Sodium	mg Na/l	112	123
93	Dissolved Calcium	mg Ca/l	33	55
93	Dissolved Potassium	mg K/l	12.0	7.69
93	Dissolved Magnesium	mg Mg/l	24	47
93	Dissolved Sodium	mg Na/l	112	123
68G2	Hexavalent Chromium	mg Cr/l	<0.013	<0.013
92	Dissolved Mercury*	µg Hg/l	<5	<5
94	Total Chromium	µg Cr/l	40	<10
91	Total Phosphorus	mg P/l	<0.5	<0.5
10G2	p - Alkalinity	mg CaCO ₃ /l	pH <8.3, No p - Alkalinity detected	pH <8.3, No p - Alkalinity detected
Calc.	m - Alkalinity	mg CaCO ₃ /l	371	343
16G2	Chloride	mg Cl/l	85	214
3	Chemical Oxygen Demand (Total)	mg O ₂ /l	180	<25
2B	Electrical Conductivity at 25°C	mS/m	104	139
64G2	Total Ammonia	mg N/l	2.27	<1
Calc.	Free Ammonia	mg N/l	<1.5	<1.5
Calc.	Saline Ammonia	mg N/l	2.18	<1.5
65G2c	Nitrate	mg N/l	<1	<1
65G2b	Nitrite	mg N/l	<0.25	<0.25
132	Total Oil & Grease*	mg/l	2	1
1B	pH at 25°C	pH units	7.9	8.0
66G2	Orthophosphate	mg P/l	0.10	0.20
67G2	Sulphate	mg SO ₄ /l	9.47	25
5	Suspended Solids at 105°C	mg/l	1062	32
41	Total Dissolved Solids at 180°C	mg/l	576	710
Calc.	Calcium Hardness	mg CaCO ₃ /l	82	142
Calc.	Magnesium Hardness	mg CaCO ₃ /l	101	197
Calc.	Total Hardness	mg CaCO ₃ /l	183	339
Microbiological				
32	<i>E.coli</i>	MPN/100ml	58	4
32	Total Coliforms	MPN/100ml	2420	1300
31	Standard Plate Count	colonies/ml	700	>1000



Refer to the "Notes" section at the end of this report for further explanations.

Where a deviation has been noted, the validity of the results may be affected. Results should be used with this consideration in mind.

Specific Observations

None



Quality Assurance

Technical signatories

Microbiology: Karishma Deepnarain

Notes to this report

Limitations

This report shall not be reproduced except in full without prior written approval of the laboratory. Results in this report relate only to the samples as taken, and the condition received by the laboratory. Any opinions and interpretations expressed herein are outside the scope of SANAS accreditation. Sample preparation may require filtration, dilution, digestion or similar. Final results are reported accordingly. Where the laboratory has undertaken the sampling, the location of sampling and sampling plan are available on request. Talbot is guided by the National Standards SANS 5667-1:2008 Part 1 Guidance on the Design of Sampling Programmes and Sampling Techniques and SANS 5667-3:2008 Part 3 Guidance on the Preservation and Handling of Water Samples.

Customers to contact Talbot Laboratories for further information.

Uncertainty of measurement

The reported uncertainty of measurement is based on a standard uncertainty multiplied by a coverage factor of $k=2$, which, unless otherwise specifically stated, provides a level of confidence of approximately 95%. Uncertainty of measurement is available [here](#).



Decision Rule

Talbot Laboratories (Pty) Ltd shall apply the following decision rule in assessing the conformity of test results to the specification on the test report:

- A binary rule (pass / fail) based on a guard band as referenced in ILAC G8_09_2019; shall apply to results. This has a global false acceptance risk of 2%.
- Statements of conformity are reported as:
Passed - The measured values were observed within tolerance at the points tested.
Failed - The measured values were either observed out of tolerance at the points tested.
- Based on the laboratory's decision rule, all results in bold font are deemed non-compliant to the defined specification per determinand, where applicable.
- The decision rule will only be applied to accredited method results.
- In instances when a statement of conformity is not required, test results are reported as an absolute value.

Analysis explanatory notes

Tests may be marked as follows:

^A	Tests conducted at our Pretoria satellite laboratory (1 Sydney Brenner St, Lynwood, Pretoria, 0087).
*	Tests not included in our Schedule of Accreditation and therefore that are not SANAS accredited.
#	Tests that have been sub-contracted to a peer laboratory.
NR	Not required -shown, for example, where the schedule of analysis varied between samples.
σ	ISO 9001 Certified testing.
²	Testing has deviated from Method.

*****End of Report*****

WETLAND IMPACT ASSESSMENT IN SUPPORT OF THE PROSPECTING RIGHT APPLICATION OF COAL ON LOT 289 EMPANGENI 13389 GU AND LOT 285 EMPANGENI 13400 GU IN KING CETSHWAYO DISTRICT MUNICIPALITY, KWAZULU-NATAL PROVINCE

Document Number: HG01-00-GEN-2026.01.27-r1-REP-VAH118

Prepared By:

Hunts Green Consulting (Pty) Ltd

Prepared For:

Vahlengwe Mining Advisory and Consulting (Pty) Ltd

Attention To:

Lusizo Nqasha

Date:

March 2026

Hunts Green Consultants (Pty) Ltd

Burkina Faso | Côte d'Ivoire | D.R. Congo | Malawi | Mali | South Africa | Tanzania

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HUNTS GREEN

Wetland and Risk Assessment in Support of Prospecting Right Application of Coal in King Cetshwayo District Municipality in the KwaZulu-Natal Province

March 2026

Document History and Distribution List

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HG01-00- GEN- 2026.01.27-r1- REP-VAH118	Julia Ndou <i>Pr.Sci.Nat</i> 133433 IAIAsa 7776 SA Wetland Society: 2192828	Khume Mtshweni <i>Pr.Sci.Nat</i> 138592	Lungile Lembede <i>Pr.Sci.Nat</i> 125677	27/03/2026	P001	For client information

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EXECUTIVE SUMMARY

Hunts Green (Pty) Ltd was appointed by Vahlegwe Mining Advisory and Consulting (Pty) Ltd on behalf of Molobedu Makoweni (Pty) Ltd to undertake a wetland and risk assessment in support of a prospecting right application of coal in King Cetshwayo District Municipality in the KwaZulu-Natal Province.

The field investigation aimed to verify the presence of wetlands within the proposed Application Area and the adjacent 500 m regulated zone. Based on the site assessment and a review of project mapping, no wetlands were identified within either the Application Area or the 500 m regulated area. The features identified during the site assessment were classified as rivers and streams and were therefore excluded from the wetland assessment, as their ecological condition must be evaluated separately through a Present Ecological State (PES) assessment within the framework of an aquatic biodiversity study. However, the riparian ecological integrity of these systems was considered through an assessment of the riparian zones associated with the identified rivers and streams. The results for the riparian habitats associated with the streams are presented below.

No. of Channels	Type of Channel	Score (%)	Ecological Category
1 to 5	Non-perennial Streams	75.3	C

An ecological assessment of streams within the Application Area indicates that the proposed prospecting activities pose a Moderate Risk to streams and associated riparian zones, primarily due to the proximity and partial overlap of infrastructure with these sensitive systems. Potential impacts include disturbance to channel morphology, degradation of riparian vegetation, increased sedimentation, and reduced water quality. However, this risk can be reduced to Low through strict implementation of mitigation measures, notably the establishment and maintenance of a minimum 55 m buffer around all streams, within which no activities should occur. Additional risk reduction can be achieved by relocating infrastructure outside of aquatic and riparian areas, preferably within already disturbed zones such as near existing residential areas, and by prioritising the use of existing access roads for drilling activities to minimise further disturbance.

Reasoned Opinion of the Specialist

It is the opinion of the specialist that the proposed activities can be considered acceptable from an ecological perspective, provided that strict avoidance measures are implemented. This includes the establishment and maintenance of a minimum a minimum 55 m buffer around all streams and associated riparian areas, the utilisation of existing access routes, and the relocation of infrastructure to already disturbed areas where feasible. The development of a comprehensive riparian zone rehabilitation plan is recommended to restore, enhance, and maintain wetland function following any disturbances that may be caused during construction, operational and decommissioning activities.



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LIST OF ACRONYMS AND ABBREVIATIONS

BSPs	Biodiversity Sector Plans
CBA	Critical Biodiversity Areas
CMAs	Catchment Management Agencies
CR	Critically Endangered
DMPR	Department of Mineral and Petroleum Resources
DWS	Department of Water and Sanitation
EAA	Environmental Authorisation Application
EAP	Environmental Assessment Practitioners
EC	Ecological Categories
EIS	Ecological Importance and Sensitivity
EN	Endangered
GPS	Global Positioning System
HGM	Hydrogeomorphic unit
KZN	KwaZulu-Natal
LC	Least Concern
MPRDA	Minerals and Petroleum Resources Development Act
NBA	National Biodiversity Assessment
NEMA	National Environmental Management Act
NEMBA	National Environmental Management: Biodiversity Act
NEMWA	National Environmental Management: Waste Act
NFEPA	National Freshwater Ecosystem Priority Areas
NT	Near Threatened
NWA	National Water Act
NWCS	National Wetland Classification Systems
NWM5	National Wetland Map 5
NWRS III	National Water Resource Strategy III
PES	Present Ecological Status
PAs	Protected Areas
RAM	Risk Assessment Matrix



RMO	Recommended Management objective
SACNASP	South African Council for Natural Scientific Professions
SAIIAE	South African Inventory of Inland Aquatic Ecosystems
SACS	South African Committee for Stratigraphy
SANBI	South African National Biodiversity Institute
SANLC	South African National Land Cover
SQRs	Sub-Quaternary Reaches
UQ	Uranium Quantity
VU	Vulnerable
WMAs	Water Management Areas
WUA	Water Use Authorisation
WULA	Water Use Licence Application



1 Introduction

Hunts Green (Pty) Ltd was appointed by Vahlengwe Mining Advisory and Consulting (Pty) Ltd on behalf of Molobedu Makoweni (Pty) Ltd to undertake a wetland impact assessment in support of an of prospecting right application of coal in King Cetshwayo District Municipality in the Kwazulu-Natal Province.

1.1 Project Location and Extent

The Environmental Authorisation application has been lodged with the Department of Mineral and Petroleum Resources (DMPR Reference No: KZN 30/5/1/1/2/ 12129 PR), which is the Competent Authority for environmental authorisations related to prospecting activities in terms of the National Environmental Management Act (NEMA). The project seeks to establish regulated coal extraction operations on approximately 1,170.0 ha. The site supports regional construction and infrastructure needs through sustainable extraction of coal. For the purposes of this report, the wetland assessment focused primarily on the portion of the Application Area (~5.30 ha) designated for the construction of the proposed infrastructure footprint and other project-related activities, rather than the entire Application Area.

The identified properties forming part of the application area are as follows:

- Lot 289 Empangeni 13389 GU, and
- Lot 285 Empangeni 13400 GU
 - Portion GU/13400

The proposed Application Area is located near Tshokolwane Village, 19 km North of Empangeni and 21 km West of KwaMbonambi town, accessible via the R34 access road, within Wards 17, 32 and 33. The site falls under the jurisdiction of the uMhlathuze Local Municipality and the Mfolozi Local Municipality, within the King Cetshwayo District Municipality, KwaZulu-Natal Province (see Figure 1-1).

1.2 Project Description

The proposed Prospecting Right (PR) project, to be undertaken by Molobedu Makoweni (Pty) Ltd, to excavate and prospect for coal value, in respect of Lot 289 Empangeni 13389 GU, and Lot 285 Empangeni 13400 GU, located within the King Cetshwayo District Municipality, KZN Province. The project seeks to establish regulated coal extraction operations on approximately 1,170.0 hectares. The site supports regional construction and infrastructure needs through sustainable extraction of coal.

The project requires environmental authorization in terms of the National Environmental Management Act (NEMA, 1998) and a prospecting right under Section 16 of the Mineral and Petroleum Resources Development Act (MPRDA, 2002). Several other legislative frameworks apply, including the National Water Act, the National Environmental Management: Biodiversity Act, and the National Environmental Management: Air Quality Act. The project is designed to operate within the framework of South Africa's environmental legislation, including the



National Environmental Management Act (NEMA). It is subject to a Basic Assessment (BA) process as prescribed by the Environmental Impact Assessment (EIA) Regulations. Thus, prospecting activities will be conducted using mechanised equipment, primarily drill rigs, to ensure efficient and controlled resource recovery.

Molobedu Makoweni (Pty) Ltd will demonstrate its commitment to responsible mining practices and environmental stewardship while contributing to the economic development of the region. However, Vahlengwe Mining Advisory and Consulting (Pty) Ltd, hereafter “Vahlengwe”, has been appointed by Molobedu Makoweni (Pty) Ltd as the independent Environmental Assessment Practitioner (EAP) to facilitate the Environmental Authorisation for the prospecting right application for exploring coal value.

The PR area applied for covers an area of approximately 1,158.0 ha, where the applicant intends to use drill rigs to extract coal core logs. The PR area applied for covers an area of approximately 1,158.0 ha, where the applicant intends to use drill rigs to extract coal core logs. The main objective of core drilling is to produce a core sample, which is used to check the mineral content and the quality of the rock. Core drilling is a rotary cutting drilling method consisting of a ring-shaped drill bit armed with cutting tools, which is forced into the rock surface and rotated clockwise at a high speed. A core sample is cut out of the rock for analysis. Drilling a coal sample for coal exploration typically takes a few hours to a few days per hole, depending on the depth, geological conditions, core recovery method and drilling speed. It is anticipated that the exploration will take 5 years, with the possibility of an extension of 3 years..

Drilling the individual cores disturbs a small footprint per drill pad, does not involve large scale excavation, the activity is temporary and short in duration, therefore, direct hydrological risk is expected to be limited, although associated surface water risks remain possible. However, the supporting activities may cause surface water risks, such as hydrocarbon spills, contaminated runoff from storage areas, poor waste handling and machinery leaks. Vahlengwe has commissioned a separate pollution prevention contingency plan to manage these identified risks. This wetland assessment focuses on the portion of the application area (~5.30 ha) designated for the construction of infrastructure and other project-related activities, rather than the entire Application Area.

To undertake this mining activity, the following infrastructure is required, which includes (Figure 1-2):

- Administration mobile offices;
- Ablution facilities;
- Parking bay for machineries;
- Parking for staff and visitors;
- Bunded walls to store chemicals like diesel or fuel;
- Waste bins;
- Equipment such as the excavators, front-end loaders, water tankers, dump trucks; and

Client: Vahlengwe Mining Advisory and Consulting (Pty) Ltd

Report Title: WETLAND IMPACT ASSESSMENT IN SUPPORT OF THE PROSPECTING RIGHT
APPLICATION OF COAL ON LOT 289 EMPANGENI 13389 GU AND LOT 285 EMPANGENI 13400 GU IN KING
CETSHWAYO DISTRICT MUNICIPALITY, KWAZULU-NATAL PROVINCE

Document Number: HG01-00-GEN-2026.01.27-r1-REP-VAH118



HUNTS GREEN

- **Crushing and screening.**

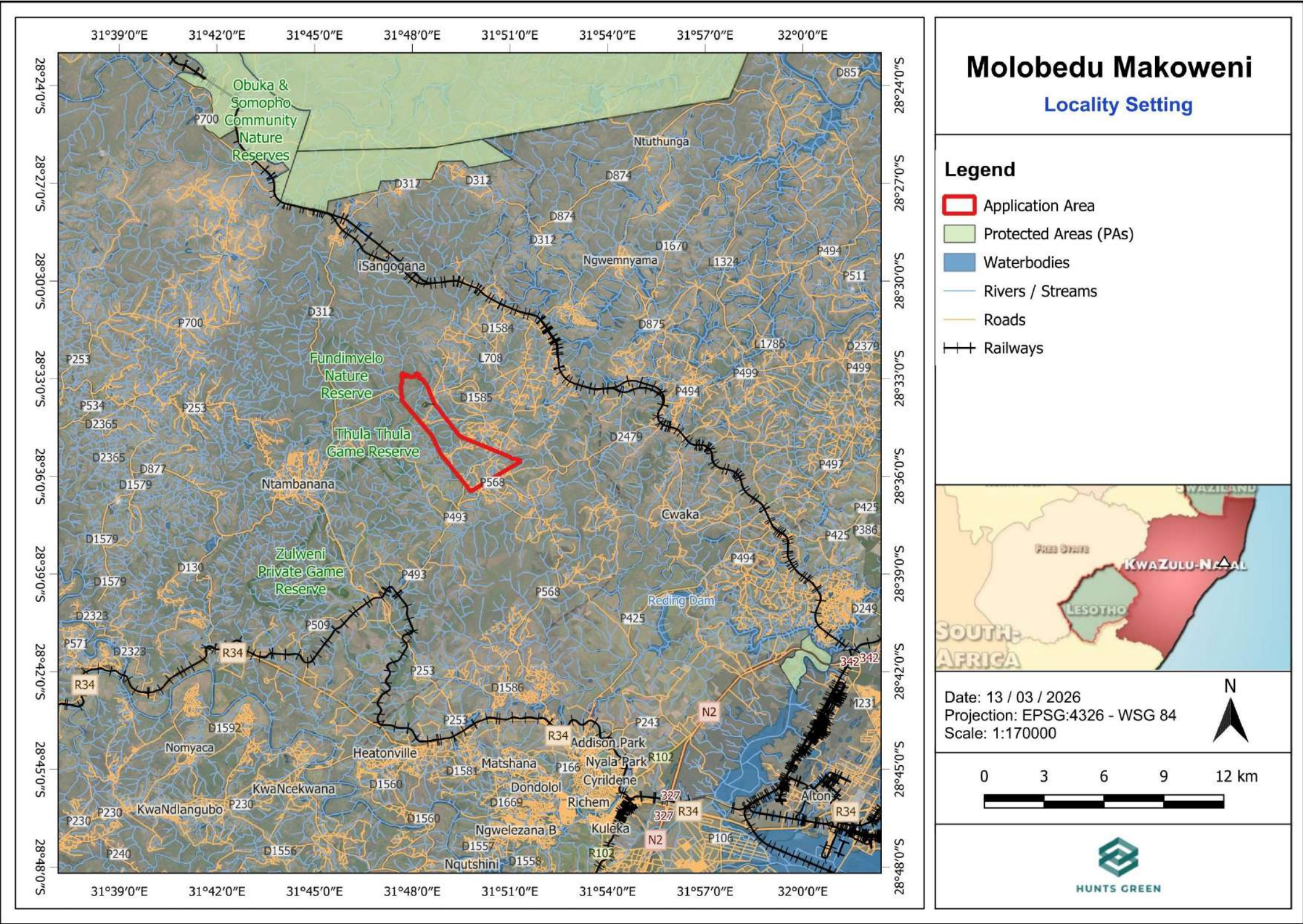


Figure 1-1: Locality of the Application Area

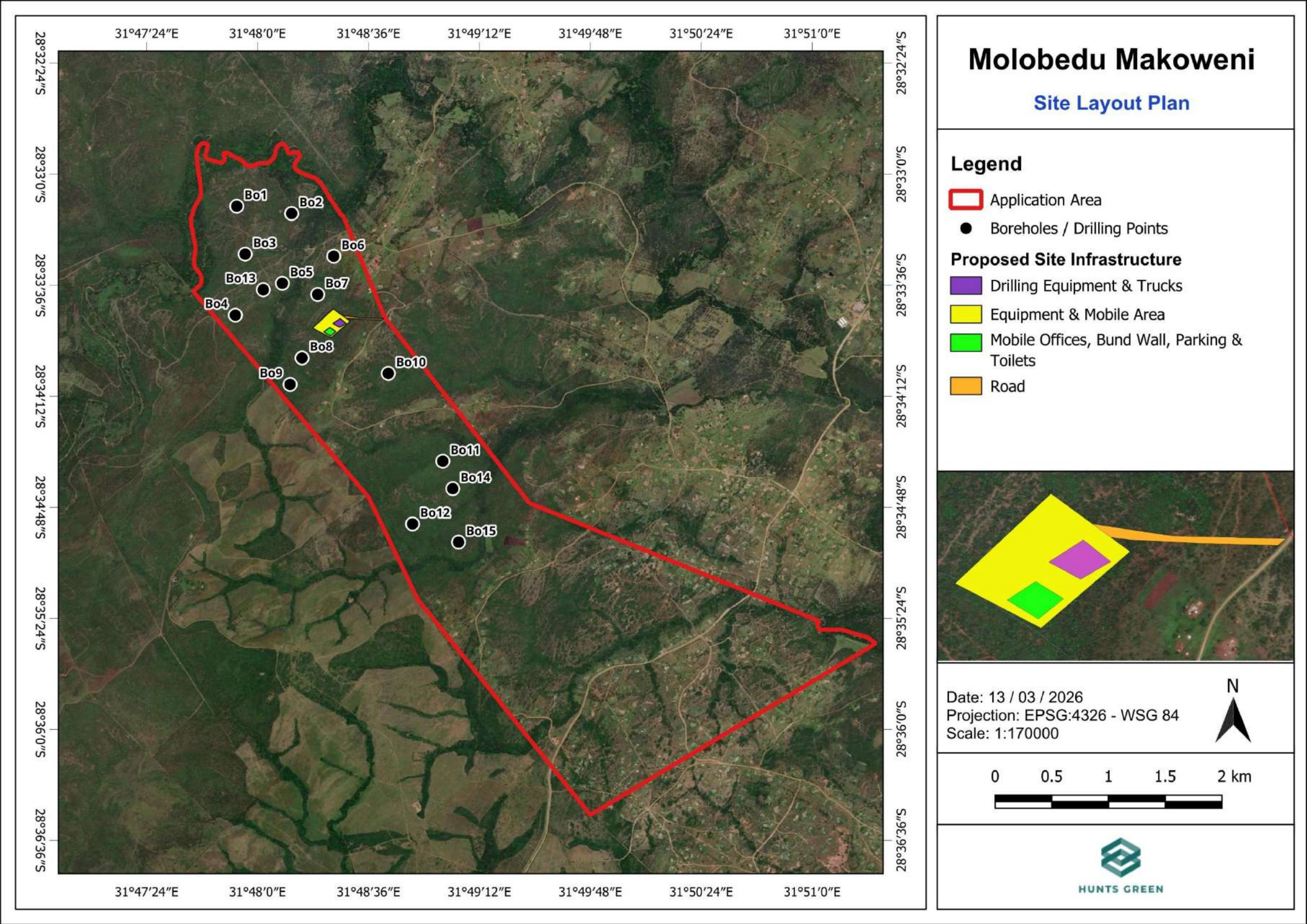


Figure 1-2: Site layout plan of the Application Area



2 Scope of Work

The scope of work required for the study includes the following:

- To delineate all watercourses within the assessed area.
 - Delineate all wetlands and streams within the 500 m regulated area of the Application Area.
- To classify the identified wetland habitats in accordance with the latest approach; 'Classification System for Wetlands and other Aquatic Ecosystems in South Africa' (Ollis *et al.*, 2013).
- To assess the delineated wetlands:
 - Determine the Present Ecological State score (PES) using a Level 2 Wet-Health assessment
 - Determine the Functional Integrity along with the Ecological Importance and Sensitivity (EIS) of the identified wetlands using the Level 2 Wet-EcoServices approach.
- To identify impacts on the identified wetlands from the proposed project.
- To recommend buffers, mitigation measures and suitable rehabilitation measures to reduce impacts on wetland systems.
- Reporting – this report was compiled to present findings of the study as well as conclusions and recommendations considering the proposed activities.

3 Legal and Administrative Framework

3.1 National Legislation

Environmental legislation in South Africa is essential for safeguarding biodiversity, managing resources sustainably, and addressing climate change. It helps control pollution, protect public health, and ensures adherence to international environmental commitments. These laws establish accountability while balancing economic growth with environmental conservation, ensuring that natural resources are preserved for the benefit of both present and future generations.

The Constitution of the Republic of South Africa (1996) promotes sustainability; social, ecological and developmental issues are considered to be equally important. The South African National Water Policy (1997) and the NWA were promulgated to ensure that the nation's water resources are protected, used, developed, conserved, managed and controlled in an equitable, efficient and sustainable manner (DWS, 2014).

Protecting wetlands, rivers and streams by:



- promoting sustainable utilisation;
- prevention of degradation; and
- ensuring rehabilitation of wetlands, rivers and streams.

Preventing pollution of wetlands, rivers and streams, i.e. the direct or indirect alteration of the physical, chemical or biological properties so as to make it:

- less fit for any beneficial purpose for which it may reasonably be expected to be used; or
- harmful or potentially harmful-
- to the welfare, health or safety of human beings;
- to any aquatic or non-aquatic organisms;
- to the resource quality; or
- to property.

This wetland assessment has been prepared to provide the necessary specialist input in support of the applications for both an Environmental Authorisation (EA) in terms of the National Environmental Management Act (NEMA) and a Water Use License (WUL) in terms of the National Water Act (NWA). The assessment is a legislated requirement and has been undertaken in accordance with the relevant South African environmental regulations, regulatory procedures, and technical guidelines, as outlined in Table 3-1. These frameworks collectively ensure that the evaluation of potential impacts on wetland ecosystems is consistent with national standards, scientifically robust, and aligned with the country's legal obligations for environmental protection and sustainable resource use.

Table 3-1: Relevant South African environmental legislation

Legislation / Policy	Year	Type	Level of Government	Compliance Checklist
Constitution of South Africa (Constitution) (Section 24–Environment).	1996	Act (108)	National	The project must uphold the constitutional right to an environment that is not harmful to health or well-being. Activities must prevent ecological degradation, promote conservation, and ensure sustainable development, including the protection of wetland ecosystems.
National Biodiversity Assessment (NBA)	2018	Assessment	National	The NBA provides spatial data on Freshwater Ecosystem Priority Areas (FEPAs), Critical Biodiversity Areas (CBAs), and threatened freshwater ecosystems. This information informs site sensitivity, impact assessment, avoidance, and mitigation planning for wetland systems.



Legislation / Policy	Year	Type	Level of Government	Compliance Checklist
National Biodiversity Framework (NBF) 2019-2024	2019	Framework	National	The project aligns with national biodiversity priorities by integrating biodiversity conservation, sustainable use, and ecosystem protection into planning and decision-making, including for freshwater and wetland ecosystems.
National Environmental Management Act (NEMA) (Chapter 5)	1996	Act (107)	National	The project must comply with NEMA's environmental management principles, including the precautionary approach, duty of care, and sustainable development. Sensitive ecosystems such as wetlands must be avoided or impacts minimised, managed, and rehabilitated.
National Environmental Management: Biodiversity Act (NEM:BA).	2004	Act (10)	National	The project must ensure the conservation of biodiversity and protection of ecosystems, including wetland-associated species and ecological processes, and comply with biodiversity management requirements.
National Environmental Management: Biodiversity Act (NEM:BA): Threatened or Protected Species (TOPS) regulations.	2004	Act (10)	National	Where threatened or protected species occur, the project must avoid impacts or obtain the necessary permits for disturbance, removal, or relocation, ensuring compliance with conservation and animal welfare requirements.
National Environmental Management: Biodiversity Act: Alien and Invasive Species Regulations, 2014, (as amended).	2014	Regulation	National	The project must prevent the introduction and spread of listed invasive species and implement control or eradication measures, particularly within wetlands and riparian zones.
National Environmental Management: Protected Areas Act (NEM:PAA)	2003	Act	National	The project must ensure that activities do not compromise the ecological integrity or management objectives of protected areas or buffer zones that include wetlands or aquatic ecosystems.
National Forests Act (NFA)	1998	Act (84)	National	Where forested wetlands or riparian forests occur, the project must ensure that protected trees and indigenous forest ecosystems are not damaged or removed without authorisation.
National Freshwater Ecosystems Priority Areas (NFEPA) (Nel <i>et al.</i> , 2011)	2011	Policy-supporting spatial dataset	National	The project must consider NFEPA data to identify and protect priority wetlands and freshwater ecosystems critical for biodiversity conservation and water security. Impacts on NFEPA areas should be avoided or strictly mitigated.
National Veld and Forest Fire Act	1998	Act (101)	National	The project must implement fire prevention and management measures to prevent degradation of wetland vegetation, riparian zones, and organic wetland soils.
National Water Act (NWA)	1998	Act (36)	National	Wetlands are recognised as water resources. The project must assess risks related to Section 21(c) (impeding or diverting flow in a watercourse) and



Legislation / Policy	Year	Type	Level of Government	Compliance Checklist
				Section 21(i) (altering the bed, banks, course, or characteristics of a watercourse). Water abstraction near wetlands may require a General Authorisation or Water Use Licence.
KwaZulu-Natal Biodiversity Sector Plan (e.g., Amajuba BSP, other District BSPs)	2015	Biodiversity Sector Spatial Plan	Provincial (District)	The project must comply with the Biodiversity Sector Plan (BSP) maps as integrated into the relevant Integrated Development Plan (IDP) and Spatial Development Framework (SDF). Critical Biodiversity Areas (CBAs) and Ecological Support Areas (ESAs) identified in these plans must be recognised and fully incorporated into project planning and decision-making processes.
Ramsar Convention on Wetlands of International Importance	1975 (SA acceded 1975)	International Convention	International / National obligation	The project must support South Africa's commitment to the wise use and conservation of wetlands. Where Ramsar-listed wetlands occur, activities must avoid degradation of ecological character.
Spatial Planning and Land Use Management Act (SPLUMA)	2013	Act (16)	National	Land-use planning must account for environmental sensitivity and wetland conservation, ensuring wetlands and buffers are appropriately protected in spatial development frameworks and land-use schemes.
Water Use Licence Application and Appeals Regulations (GNR. 267 of 24 March 2017)	2017	Regulation	National	The project must comply with procedural requirements for applying for, amending, or appealing water use licences, ensuring lawful water use and protection of wetland and aquatic systems.

3.2 International Legislation

3.2.1 The Ramsar Convention

The Ramsar Convention is legally named the Convention on Wetlands of International Importance Especially as waterfowl Habitat and was adopted by the International Conference on the Wetlands and Waterfowl at Ramsar, Iran, 2 February 1971 in order to recognise amongst others that wetlands constitute a resource of great economic, cultural, scientific, and recreational value, the loss of which would be irreparable. This current Project does not fall under or is near to a Ramsar site.



4 Methodology

4.1 Desktop Assessment

A desktop assessment of the environment is an initial, non-invasive review of the environmental conditions of a specific area or Application Area. It involves gathering and analysing existing data, maps, reports, and other available resources to evaluate potential environmental impacts or risks without physically visiting the site. This assessment typically includes reviewing environmental features such as land use, water resources, biodiversity, and historical land disturbances. It helps in identifying key environmental issues, informing decision-making, and determining the need for further studies or on-site investigations, such as EIAs or WULAs. The baseline data was utilised during the desktop assessment to determine the biophysical context of the site as well as National and Provincial legislation that governs the existing and proposed activities.

4.2 Baseline Data

The aim of the desktop study was to identify the current biodiversity and ecosystem status through various databases including but not limited to the following:

- A Practical Field Procedure for Identification and Delineation of Wetland and Riparian Areas –Edition 1' (DWAF, 2005).
- Contour data (derived from Shuttle Radar Topography Mission (SRTM) 30 m Digital Elevation Model (DEM) <http://earthexplorer.usgs.gov>).
- Google Earth™ satellite imagery was used at the desktop level.
- SANBI's Threatened species list: Red list of South African plants version 2020.1. Downloaded from Redlist.sanbi.org.
- South African Inventory of Inland Aquatic Ecosystems (SAIIAE Wetland Map 5, 2018).
- South African National Botanical Institute (SANBI) Biodiversity GIS (BGIS) to search for spatial biodiversity information.
- Technical Report for the KwaZulu-Natal Biodiversity Sector Plan (KZNBSP), 2014.
- The National Freshwater Ecosystem Priority Areas (NFEPA) were used in determining any priority wetlands.
- Vegetation type dataset from Mucina and Rutherford (2006), with amendments by SANBI (NBA, 2019) were used in determining the vegetation type of the study area.



4.3 Site Investigation

This report documents the current state of wetland biodiversity within the freshwater ecosystems associated with the proposed Application Area. Field investigations were undertaken on the 14th of January 2026 during the summer season, a period considered suitable for assessing vegetation structure, habitat condition, and ecological processes.

The assessment comprised of a comprehensive visual survey of the project footprint and its immediate surroundings, with particular emphasis on existing land use and land cover patterns. Key environmental features evaluated included freshwater bodies, riparian and wetland vegetation, overall vegetation cover, and site topography or terrain.

The fieldwork further involved the delineation of watercourses in accordance with accepted methodologies, supported by soil sampling to confirm hydromorphic characteristics where applicable. Dominant vegetation units were identified, and potential environmental impacts associated with the proposed development were noted.

Photographic records of the Project Area, including reference sites and the surrounding landscape, were captured to support observations and provide a visual record of site conditions at the time of the survey.

4.4 Wetland Definition and Delineation

A wetland is defined as an area that is seasonally or permanently saturated with water, either at or near the surface, which supports plant and animal species that are adapted to wet conditions (Ramsar Convention on Wetlands, 2016). Wetlands play critical roles in water purification, flood regulation, biodiversity conservation, and carbon sequestration. Delineation refers to the process of identifying the boundaries of a wetland based on specific criteria, including the presence of wetland vegetation, hydric soils, and evidence of hydrological processes like surface water flow or seasonal flooding (Ollis *et al.*, 2013).

In South Africa, wetland delineation is guided by national standards, such as those outlined in the National Water Act, 1998 (Act No. 36 of 1998), and the DWS guidelines, which help identify the extent and ecological functions of wetlands. This is crucial for protecting wetlands through the implementation of management practices and legal frameworks, particularly as wetlands are protected under various environmental laws and international agreements like the Ramsar Convention.

Hydrogeomorphic (HGM) types of wetlands refer to the classification of wetlands based on their hydrological, geomorphological, and ecological characteristics. These classifications help in understanding the wetland's hydrological functions, its interactions with surrounding landscapes, and its role in supporting biodiversity. The HGM classification is widely used to assess wetlands in South Africa and other parts of the world and form an important part of the delineation during site investigations.

In South Africa, the main HGM types consist of the following (Figure 4-1):



- **Floodplains/Rivers:** These wetlands are typically located in the valley bottoms of rivers and are inundated during high flow periods. They are shaped by the flooding and deposition of sediment by rivers. Floodplains have a high biodiversity and serve important functions like water filtration and flood attenuation.
- **Valley Bottom Wetlands:** These wetlands occur in low-lying areas, often between slopes, and are influenced by groundwater or surface water. They are typically characterised by waterlogged soils and support a range of wetland vegetation, playing vital roles in water storage and biodiversity.
 - **Channelled Valley Bottom Wetlands** are characterised by the presence of a defined channel through which water flows, such as a river or stream. Water in these wetlands is primarily influenced by surface water runoff and the flow of water within the channel. The vegetation and hydrology in channelled valley bottom wetlands are closely tied to the dynamics of the channel, with seasonal flooding and sediment deposition playing important roles in shaping the wetland's characteristics.
 - **Unchannelled Valley Bottom Wetlands** lack a defined water channel. Water in these wetlands primarily comes from groundwater, surface water runoff, and precipitation, and tends to accumulate in the low-lying areas of the valley floor. Unchannelled valley bottom wetlands can support a wide variety of wetland plant species and play important roles in groundwater recharge, water storage, and the prevention of soil erosion. The water table in these wetlands tends to be high, and they may experience more uniform water distribution compared to channelled wetlands.
- **Depressions:** These wetlands form in areas that are lower than the surrounding landscape and collect water from surface runoff, rainfall, or groundwater. They can be temporary or permanent and are often dominated by specific wetland plant species.
- **Seeps:** These wetlands are located along the edges of rivers, lakes, or reservoirs, where groundwater and surface water interact. They are particularly important for maintaining water quality and providing habitat for aquatic and terrestrial species.
- **Wetland Flats:** These are relatively flat areas that may be periodically inundated by surface water or groundwater, with minimal slope. They often form in flat terrain where water accumulates and can support various plant and animal species adapted to wet conditions.

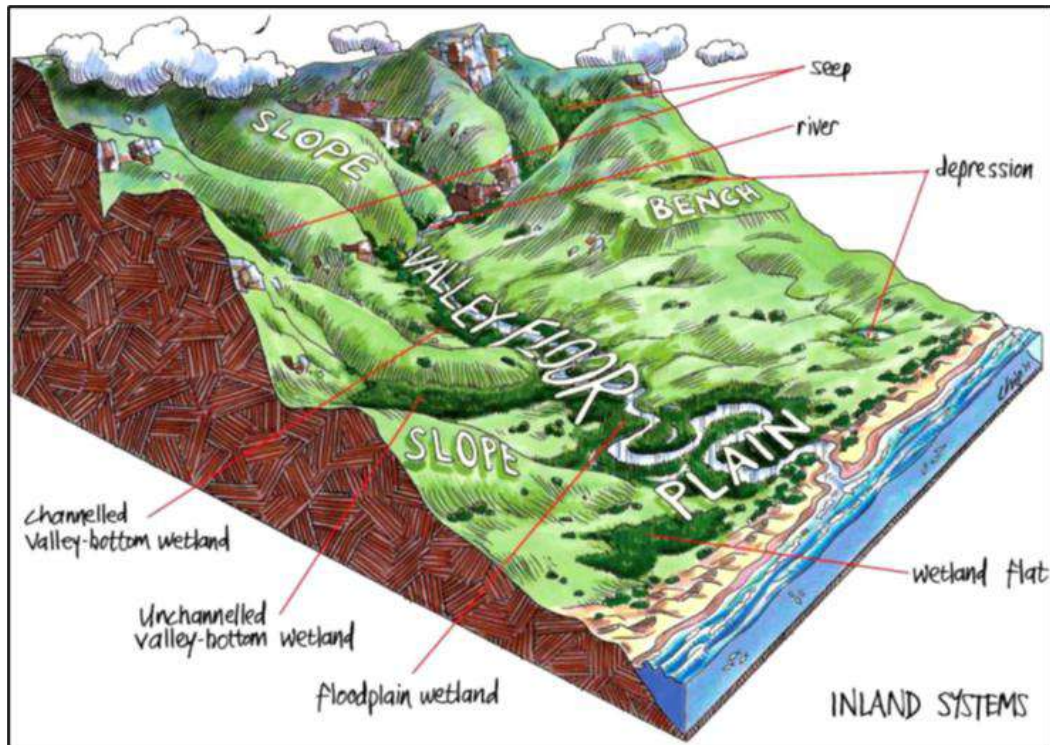
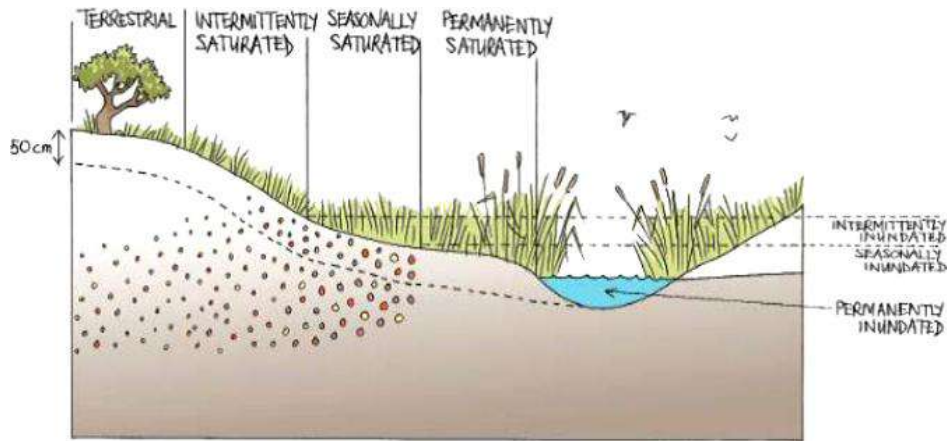


Figure 4-1: Seven wetland hydrogeomorphic (HGM) units (Ollis *et al.*, 2013)

Wetland assessment methodology (Ollis *et al.*, 2013) is shown in Table 4-1.



Table 4-1: Wetland Assessment Methodology.

Assessment Aspect	Criteria	Determinant																												
Delineation	Wetland Indicators: ■ The Terrain Unit Indicator ■ The Soil Form Indicator ■ The Soil Wetness Indicator ■ The Vegetation Indicator Vegetation serves as the primary wetland indicator, but in practice, the soil wetness indicator tends to be the most crucial and reliable. The other three indicators are typically utilised in a confirmatory role.																													
Present Ecological State (PES) / Wet Health	The health of wetland systems is assessed using the WET-Health Version 2 methodology developed by Macfarlane <i>et al.</i> , (2020). The overall approach is to quantify the impacts of human activity or clearly visible impacts on wetland health, and then to convert the impact scores to a Present Ecological Status (PES) score. This takes the form of assessing the spatial extent of impact of individual activities/occurrences and then separately assessing the intensity of impact of each activity in the affected area. The extent and intensity are then combined to determine an overall magnitude of impact.	<table><tr><th>Ecological Category</th><th>Description</th><th>Impact Score*</th><th>PES SCORE (%)</th></tr><tr><td>A</td><td>Unmodified, natural.</td><td>0-0.9</td><td>90-100</td></tr><tr><td>B</td><td>Largely natural with few modifications. A slight change in ecosystem processes is discernible, and a small loss of natural habitats and biota may take place.</td><td>1-1.9</td><td>80-89</td></tr><tr><td>C</td><td>Moderately modified. A moderate change in ecosystem processes and loss of natural habitats has taken place but the natural habitat remains predominantly.</td><td>2-3.9</td><td>60-79</td></tr><tr><td>D</td><td>Largely modified. A large change in ecosystem processes and loss of natural habitat and biota is great but some remaining natural habitat features are still recognisable.</td><td>4-5.9</td><td>40-59</td></tr><tr><td>E</td><td>Seriously modified. The change in ecosystem processes and loss of natural habitat and biota is great but some remaining natural habitat features are still recognisable.</td><td>6-7.9</td><td>20-39</td></tr><tr><td>F</td><td>Critically modified. Modifications have reached a critical level, and the ecosystem processes have been modified completely with an almost complete loss of natural habitat and biota.</td><td>8-10</td><td>0-19</td></tr></table>	Ecological Category	Description	Impact Score*	PES SCORE (%)	A	Unmodified, natural.	0-0.9	90-100	B	Largely natural with few modifications. A slight change in ecosystem processes is discernible, and a small loss of natural habitats and biota may take place.	1-1.9	80-89	C	Moderately modified. A moderate change in ecosystem processes and loss of natural habitats has taken place but the natural habitat remains predominantly.	2-3.9	60-79	D	Largely modified. A large change in ecosystem processes and loss of natural habitat and biota is great but some remaining natural habitat features are still recognisable.	4-5.9	40-59	E	Seriously modified. The change in ecosystem processes and loss of natural habitat and biota is great but some remaining natural habitat features are still recognisable.	6-7.9	20-39	F	Critically modified. Modifications have reached a critical level, and the ecosystem processes have been modified completely with an almost complete loss of natural habitat and biota.	8-10	0-19
		Ecological Category	Description	Impact Score*	PES SCORE (%)																									
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		B	Largely natural with few modifications. A slight change in ecosystem processes is discernible, and a small loss of natural habitats and biota may take place.	1-1.9	80-89																									
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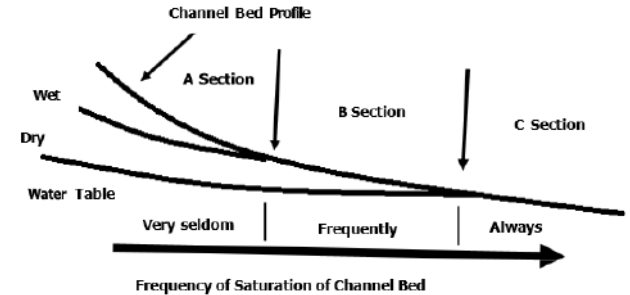
Assessment Aspect	Criteria	Determinant						
Wetland Ecological Importance and Sensitivity (EIS)	The method used for the EIS determination was adapted from the method as provided by DWS (1999) for floodplains. The method takes into consideration PES scores obtained for WET-Health Version 2 as well as function and service provision to enable the assessor to determine the most representative EIS category for the wetland feature or group being assessed. A series of determinants for EIS are assessed on a scale of 0 to 4.	EIS		Range of Mean		Recommended Ecological Management Class		
		Very High		3.1 to 4.0		A		
		High		2.1 to 3.0		B		
		Moderate		1.1 to 2.0		C		
		Low Marginal		<1.0		D		
Wetland Functionality / Ecosystems Services (ES)	The assessment of the ecosystem services supplied by the identified wetlands was conducted per the guidelines as described in WET-EcoServices Version 2 (Kotze et al., 2009; Kotze et al., 2021). An assessment was undertaken that examines and rates the following services according to their degree of importance and the degree to which the services are provided.	Score		Rating of likely extent to which a benefit is being supplied				
		<0.5		Low				
		0.6 - 1.2		Moderately Low				
		1.3 – 2.0		Intermediate				
		2.1 – 3.0		Moderately High				
Recommended Ecological Category (REC)	REC typically refers to a classification system used in ecological or environmental studies to assess and categorise ecosystems or habitats based on their ecological conditions or desired management objectives (Rountree <i>et al.</i> , 2013). The Recommended Ecological Category (REC) and Recommended Management Objective (RMO) was determined based on the results obtained from the PES and EIS of the assessed wetlands, with the objective of recommending how a water resource should be managed. This is achieved by either maintaining or improving the ecological integrity of the wetland in order to ensure continued ecological functionality (DWA, 1999).	PES	Ecological Importance and Sensitivity					
			Category		Very High	High	Moderate	Low
			A	Pristine	A Maintain	A Maintain	A Maintain	A Maintain
			B	Natural	A Improve	A/B Improve	B Maintain	B Maintain
			C	Good	A Improve	B/C Improve	C Maintain	C Maintain
			D	Fair	C Improve	C/D Improve	D Maintain	D Maintain
			E/F	Poor	D Improve	E/F Improve	E/F Maintain	E/F Maintain



4.5 Riparian Assessment Techniques

The riparian assessment methodology by Macfarlane *et al.*, 2014a is shown in **Error! Reference source not found..**

Table 4-2: Riparian Habitat Assessment Methodology (Macfarlane *et al.*, 2014)

Assessment Aspect	Criteria	Determinant												
Delineation	Riparian Zone Delineation Technique: ■ Topography associated with the watercourse. This assesses changes in topography associated with the watercourse and is used in identifying the outer bank of the macro channel. ■ Vegetation is the main indicator of a riparian area and is associated with changes in species composition between the channel, the riparian area adjacent to the channel and the terrestrial areas; ■ Alluvial soils and deposited material. Riparian areas often have recent deposits of sand, silt or clay, set down by flowing water. This is not always used as a primary indicator to accurately delineate riparian areas but can be used to confirm topographical and vegetation indicators.	 The classification system separates channels into: ■ Those that do not have baseflow (A Section) or Ephemeral. ■ Those that sometimes have baseflow (B Section) or non-perennial. ■ Those that always have baseflow (C Section) or perennial.												
Riparian Ecological Integrity Assessment	The riparian ecological integrity was assessed for all drainage channels using the Riparian Vegetation Response Assessment Index (VEGRAI) (Kleynhans <i>et al.</i>, 2007). This VEGRAI uses a spreadsheet tool composed of a series of metrics and metric groups, each of which is rated in the field with the guidance of data collection sheets. The metrics in VEGRAI describe the following attributes associated with both the woody and non-woody	<table> <tr> <th>Class</th><th>Description</th><th>Score (%)</th></tr> <tr> <td>A</td><td>Unmodified</td><td>100</td></tr> <tr> <td>B</td><td>Largely natural with few modifications. A small change in natural habitats and biota may have taken place but the ecosystem functions are essentially unchanged.</td><td>80-99</td></tr> <tr> <td>C</td><td>Moderately modified. A loss and change of natural habitat and biota have occurred but the basic ecosystem functions are still predominantly unchanged.</td><td>60-79</td></tr> </table>	Class	Description	Score (%)	A	Unmodified	100	B	Largely natural with few modifications. A small change in natural habitats and biota may have taken place but the ecosystem functions are essentially unchanged.	80-99	C	Moderately modified. A loss and change of natural habitat and biota have occurred but the basic ecosystem functions are still predominantly unchanged.	60-79
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C	Moderately modified. A loss and change of natural habitat and biota have occurred but the basic ecosystem functions are still predominantly unchanged.	60-79												



Assessment Aspect	Criteria	Determinant		
	components of the lower and upper zones of the riparian area: ■ Removal of the riparian vegetation ■ Invasion by alien invasive species ■ Flow modification ■ Impacts on water quality	D	Largely modified. A large loss of natural habitat, biota and basic ecosystem functions have occurred.	40-59
		E	The loss of natural habitat, biota and basic ecosystem functions are extensive.	20-39
		F	Modifications have reached a critical level and the lotic system has been modified completely with an almost complete loss of natural habitat and biota. In the worst instances the basic ecosystem functions have been destroyed, and the changes are irreversible.	0-19



4.6 Determining Buffer Requirements

Buffer zones have been defined as a strip of land with a use, function or zoning specifically designed to protect one area of land against impacts from another. Buffer zones associated with water resources have been shown to perform a wide range of functions and have therefore been adopted as a standard measure to protect water resources and associated biodiversity. Some of these key functions include:

- Maintaining basic aquatic processes;
- Reducing impacts on water resources from upstream activities and adjoining land uses;
- Providing habitat for aquatic and semi-aquatic species;
- Providing habitat for terrestrial species; and
- A range of ancillary societal benefits.

A series of Excel™ based Buffer Zone Tools have been developed to help users determine suitable buffer zone requirements (Macfarlane *et al.*, 2014a; Macfarlane and Bredin, 2016). These include a rapid desktop tool for determining potential aquatic impact buffer zone requirements together with three site-based tools for determining buffer zone requirements for rivers, wetlands and estuaries. Central to these tools is a buffer model, which is populated automatically from the data capture sheet provided. This is based on the best available science and is used to generate buffer zone recommendations as part of the assessment process.

4.7 Impact Assessment

The potential impacts of the proposed project on the surrounding natural environment have been systematically identified, evaluated, and rated following the methodology outlined below. The tables provided illustrate and explain the methodology and criteria used to assess the Environmental Risk Ratings, as well as the calculation of the final Environmental Significance Ratings for the identified potential ecological impacts. Each potential environmental impact is assigned a score for each of the relevant Evaluation Components, as presented in Table 4-3 below, ensuring a structured and transparent assessment process.

Table 4-3: Methodology for Impact Significance

Ratings	Description
Extent (the area over which the impact will be experienced)	
1	Site
2	Local/District
3	Province/Region
4	National & International
Probability (chance of occurrence of an impact)	
1	Unlikely
2	Possible
3	Probable
4	Definite



Ratings	Description
Reversibility (degree to which an impact can be reversed upon completion)	
1	Completely reversible
2	Partly reversible
3	Barely reversible
4	Irreversible
Irreplaceability (degree to which resources will be irreplaceably lost)	
1	No loss
2	Marginal Loss
3	Significant Loss
4	Complete Loss
Duration (lifetime of the impact)	
1	Short Term
2	Medium Term
3	Long Term
4	Permanent
Cumulative Effect (impact may become significant if added to other existing/potential impacts)	
1	Negligible
2	Low Impact
3	Medium Impact
4	High Impact
Magnitude/Intensity (severity of an impact)	
1	Low
2	Medium
3	High
4	Very high
Formula:	Significance= (Extent+probability+reversibility+irreplaceability+duration+cumulative effect) x magnitude/intensity
Significance Ratings:	
6 to 28	Low
29 to 50	Medium
51 to 73	High
74 to 96	Very High

4.8 DWS Risk Assessment Matrix

Impacts were assessed using a common, defensible method that is based on the requirements of Government Notice (GN) 4167 as published in Government Gazette 49833 of 8 December 2023. This methodology pertains to the NWA (Section 21 (c) and (i) Water Use Risk Assessment Protocol). It enables the comparisons to be made between risks of potential impacts and ensures transparency in the process by which these impact risks are evaluated.

The Risk Assessment involves the analysis of the risk matrix through the evaluation of the severity of impacts to the flow regime, water quality, habitat, and biota of the water resource. The Department of Water and Sanitation (DWS) risk matrix assesses impacts in terms of consequence and likelihood. The significance of the impact is rated according to the classes presented in Table 4-4. Risk assessment keys are outlined in detail in Appendix A.

Table 4-4: Significance ratings matrix

Rating	Class	Management Description
1 – 29	Low Risk (L)	Acceptable as is or consider requirement for mitigation. Impact to watercourses and resource quality small and easily mitigated. Wetlands may be excluded.



Rating	Class	Management Description
30 – 60	Moderate Risk (M)	Risk and impact on watercourses are notably and require mitigation measures on a higher level, which costs more and require specialist input. Wetlands are excluded.
61 – 100	High Risk (H)	Always involves wetlands. Watercourse(s) impacts by the activity are such that they impose a long-term threat on a large scale and lowering of the Reserve.

5 Assumptions and Limitations

The following assumptions and limitations are applicable to this assessment:

- The wetland assessment was confined to the proposed infrastructure footprint of approximately 5.30 ha and associated 500 m regulated area, as opposed to the full application area.
- The findings, results, observations, conclusions and recommendations provided in this report are based on the author's best scientific and professional knowledge as well as available information regarding the perceived impacts on the wetland environments.
- GPS technology has inherent inaccuracies, particularly when using handheld devices. The wetlands and streams within the Application Area were delineated using GPS waypoints of onsite indicator features, with an accuracy range of 3 - 7 m. As a result, this may impact the precision of the maps produced.
- In order to obtain definitive data regarding the biodiversity, hydrology and functioning of water resources, studies should ideally be conducted over several seasons and over a number of years.
- The PES and EIS assessments undertaken are largely qualitative assessment tools and thus the results are open to professional opinion and interpretation.
-

6 Biophysical Characteristics

6.1 Climate

According to the Köppen-Geiger climate classification, the Application Area falls within the Cfa (humid subtropical) zone, which denotes a temperate climate with no distinct dry season and a hot summer (Beck *et al.*, 2018). The Application Area is aligned with Empangeni's weather.

Empangeni experiences a humid subtropical climate marked by warm, humid summers and mild, dry winters, with an average annual rainfall of approximately 948 mm, most of which falls during the summer months. From December to March, summers are warm to hot and often humid, with frequent rainfall; January is typically one of the hottest months, with average daily highs of 29-30°C and lows around 22°C.



In contrast, winters from June to August are short, cooler, and dry, characterised by clear, sunny days; July is generally the coldest month, with night-time temperatures ranging between 11-16°C and daytime highs of about 22-23°C. The region is the coldest during July when the mercury drops to 11.3°C on average during the night. Rainfall peaks in January at roughly 121 mm and is lowest in June at approximately 34 mm (Figure 6-1).

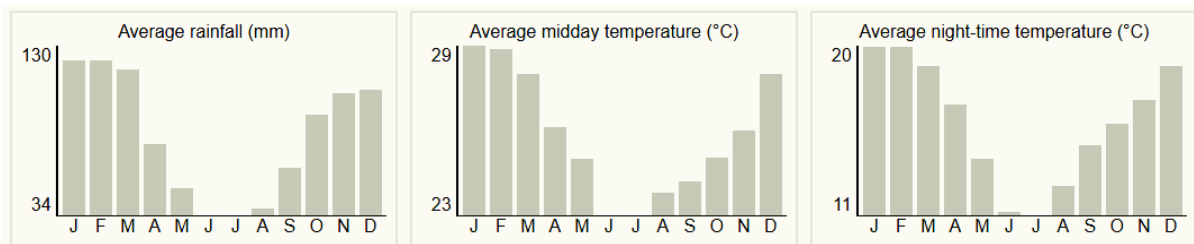


Figure 6-1: Climatic conditions of the Application Area (Source: Climate-data.org)

6.2 Geological Setting

According to the Geology Map, the Application Area is underlain by mainly the Emakwezini Formation (Pem), followed by Karoo Dolerite, Ntabene and Nyoka Formations as illustrated in Figure 6-2. The geological characteristics of this formation are summarised in the Table 6-1 below, based on data from the Council for Geoscience (2019).

Table 6-1: Geology Classification (1:250K)

Rating	Management Description			
Code	Pem	J-d	Sn	Sny
Lithostratigraphic	Emakwezini Formation	Karoo Dolerite	Ntabene Formation	Nyoka Formation
Lithology	Mudrock, sandstone, minor coal seams.	Network of dolerite sills, sheets and dykes, mainly intrusive into the Karoo Supergroup.	Fine- to coarse-grained sandstone (granuly in places), subordinate mudrock.	Red mudrock and interbedded sandstones.
UQ Geology	715	70	716	717
UQ SACS NO	588	891	589	590
	Beaufort Group from Karoo Supergroup	Karoo Supergroup	Karoo Supergroup	Karoo Supergroup

6.3 Topography

The Application Area is positioned between 130 and 250 metres above sea level (masl). In other words, the lowest parts of the site are about 130 masl, while the highest points reach about 250 masl, indicating a vertical difference (relief) of roughly 120 m across the area. This suggests the terrain is not completely flat and likely includes gentle to moderate slopes or undulating topography.



6.4 Land Use Cover

The South African National Land Cover (SANLC) datasets provide comprehensive land cover classification for South Africa, adhering to the gazetted land-cover classification standard (SANS 19144-2) (Figure 6-3). These datasets include 73 classes of information. According to the SANLC, the site has multiple primary land cover classes which are the Dense Forest and Woodland, Open Woodland, Contiguous Low Forest and Thicket, Subsistence / Small-Scale Annual Crops, Natural Grassland, Residential Formal (low veg / grass; trees; bare), Artificial Dams (including canals), Herbaceous Wetlands (previously mapped) (DFFE, 2022). The proposed Application Area is located near dense natural tree canopies, residential areas and some streams.

6.5 River Ecoregional Classification System

The River Ecoregion Classification System in South Africa is a hierarchical framework developed to delineate regions based on similar ecological characteristics (Kleynhans, Thirion and Moolman, 2005). This system primarily categorises ecoregions into different levels of detail:

- Level I Ecoregions: This is the coarsest level of classification, primarily using broad factors such as climate, geology, soils, vegetation, and physiography. These ecoregions cover large areas and provide a general overview of ecological patterns.
- Level II Ecoregions: This level offers a more detailed classification, which is still under development. It aims to provide a finer resolution of ecological differences within the Level I regions by considering more specific local characteristics. This level is expected to be more useful for detailed ecological management and conservation efforts.

The Application Area falls within a single river ecoregion namely, the North-Eastern Uplands (Level I Ecoregions 14 and Level II Ecoregions 14.05).

6.6 The Threat Status and Protection Levels for Wetland Groups

Wetland groups are classified based on their vulnerability to threats and the protection measures in place to preserve them. These groups are typically categorised by factors such as their ecological importance, rarity, and the extent of human impacts they face. The Threat Status and Protection Levels for wetland groups are often determined by environmental organisations, government agencies, and international conventions. A general overview of how they are classified is presented in Table 6-2 below.

**Table 6-2: Wetland groups classification based on their vulnerability to threats and the protection level**

Threat Status	Wetlands categorised into different threat levels based on their vulnerability:
Critically Endangered (CR)	Wetlands at severe risk of degradation or loss, often due to human activities such as draining, urban development, or pollution.
Endangered (EN)	Wetlands that are at a high risk of becoming critically endangered in the near future without intervention.
Vulnerable (VU):	Wetlands at moderate risk of decline, though they are not as immediate as those in the critically endangered or endangered categories.
Near Threatened (NT):	Wetlands that are likely to move into the threatened category if conservation measures are not implemented.
Least Concern (LC)	Wetlands that are not facing significant threats and are considered stable in their current conditions.
Protection Levels	Wetlands are also classified based on the degree of protection or conservation efforts applied:
Fully Protected	Wetlands under strict protection, often designated as protected areas, national parks, or wildlife reserves where human activity is heavily restricted.
Partially Protected	Wetlands with some level of human activity allowed, such as sustainable resource harvesting, tourism, or controlled development.
Unprotected	Wetlands without any formal protection, often subject to various human impacts like drainage, pollution, and land conversion for agriculture or infrastructure development.

The Application Area falls within the Lowveld Group 11 wetland regional setting as defined by Macfarlane *et al.* (2014b) for South Africa. This grouping is associated with warm, subtropical low-altitude landscapes and is typically characterised by dense forest and woodland contiguous low forest, and thicket, rather than inland escarpment grassland systems.

According to Macfarlane *et al.* (2014b), the ecosystem type is classified as “Vulnerable” in terms of its Ecosystem Threat Status, indicating that although a substantial portion of its original extent remains, it is experiencing ongoing pressures that may lead to further decline. The Protection Level is listed as “Well Protected”, signifying that the ecosystem is adequately represented within the formal protected area network. While the ecosystem is therefore not considered to be at immediate risk of collapse, continued habitat transformation and unsustainable land-use practices could compromise its long-term ecological integrity.

6.7 Catchment and Riverine Characteristics

South Africa's water resources are managed through a hierarchical system of catchments, with quaternary catchments serving as the principal units at the fourth level of classification, and primary catchments grouped into Water Management Areas (WMAs). Originally, nine WMAs were established under the National Water Resource Strategy 2 (2013) in alignment with the National Water Act, 1998 (Act No. 36 of 1998). However, these were revised to six WMAs to facilitate the establishment of Catchment Management Agencies (CMAs). The updated WMA boundaries were formalised in the National Water Resource Strategy III (NWRS III), gazetted on 1 September 2023 (Gazette No. 49225, Notice No. 3855), to enhance water governance and management across the country.



The Application Area falls within primary drainage region W of the Pongola–Mtamvuna WMA and spans a single sub-quaternary drainage basin, namely W12G, as illustrated in Figure 6-4. An existing Sub-Quaternary Reach (SQR) has been identified immediately north of the proposed Application Area, bordering its northern boundary. The SQR code is W12G-03229 associated with Nseleni River. This SQR has been previously assessed. Therefore, a summary of the PES and EIS information for this main river, as provided by the Department of Water and Sanitation (DWS), is presented below.

Table 6-3: A summary of Sub-Quaternary Reaches (SQRs) information

Sub-Quaternary Reaches (SQRs)	W12G-03229
SQR Name	Nseleni River
Reach Length (km)	83.6
Ecological Importance (EI) Mean	High
Ecological Sensitivity (ES) Mean	High
Present Ecological Status (PES)	C
Stream Order	1
Default Ecological Category	B

6.8 National Freshwater Ecosystem Priority Areas

National Freshwater Ecosystem Priority Areas (NFEPA) are identified zones that are prioritised for conservation and management to protect freshwater ecosystems and the services they provide (Nel *et al.*, 2011). These areas typically include wetlands, rivers, lakes, and other freshwater systems that are important for biodiversity, water supply, and ecosystem services.

In South Africa, for example, the NFEPA project was initiated to map and assess the state of freshwater ecosystems, with the goal of supporting sustainable management and decision-making. It identifies critical areas such as:

- Rivers and wetlands that have high ecological value.
- Critical water sources that support human and ecological needs.
- High biodiversity areas where conservation can support the resilience of freshwater species. NFEPA helps inform policies and management actions aimed at safeguarding water resources, enhancing biodiversity, and ensuring that future development and land-use practices do not degrade vital freshwater ecosystems.

According to the latest findings from the NFEPA project (Nel *et al.*, 2011) no wetlands are mapped within the proposed infrastructure footprint or its associated 500 m regulated area (Figure 6-5). However, the broader Application Area is associated with channelled valley-bottom wetlands.



6.8.1 National Wetlands Map 5

The National Wetland Map 5 (NWM5) encompasses both inland wetlands, utilising river line data and various other datasets from the South African Inventory of Inland Aquatic Ecosystems (SAIIAE). Precisely mapping the locations of wetlands is crucial for their classification into different ecosystem types across the country. This classification, along with other data, facilitates the identification of wetlands of conservation significance (Van Deventer *et al.*, 2020). Figure 6-6 shows that no wetlands are mapped within the proposed infrastructure footprint or its associated 500 m regulated area, based on the NWM5. However, the broader Application Area is associated with depression wetlands.

6.9 KwaZulu-Natal Biodiversity Sector Plan

The KwaZulu-Natal (KZN) Biodiversity Plan and the subsequent development of Biodiversity Sector Plans (BSPs) are crucial tools for biodiversity conservation at the provincial and district levels in South Africa. These plans help identify and map areas that are key for achieving biodiversity conservation targets and support sustainable development. These plans provide a biodiversity mapping profile that encompasses the terrestrial, aquatic, and marine environments within the district (Table 6-4).

Table 6-4: Categories of the KwaZulu-Natal (KZN) Biodiversity Plan

Map Category	Guiding Description of Categories	Land-Use Management Objective
Protected Areas (PAs)	Protected areas as declaration under NEMPA.	Maintain in a natural state with limited to no biodiversity loss.
CBAs	Natural or near-natural landscapes that include terrestrial and aquatic areas that are considered critical for meeting biodiversity targets and thresholds, and which safeguard areas required to ensure the persistence of viable populations of species, and the functionality of ecosystems and Ecological Infrastructure (EI).	Maintain in a natural state with limited to no biodiversity loss.
CBAs: Irreplaceable	Areas which are required to meet biodiversity conservation targets, and where there are no alternative sites available. (Category driven by species and feature presence).	Maintain in a natural state with limited to no biodiversity loss.
CBAs: Optimal	Areas that are the most optimal solution to meet the required biodiversity conservation targets while avoiding high-cost areas as much as possible (Category driven primarily by process).	Maintain in a natural state with limited to no biodiversity loss.
ESA: Buffers	Areas identified as influencing land-use management that are not derived based on biodiversity priorities alone, but also address other legislation / agreements which the biodiversity sector is mandated to address, e.g. WHS Convention, triggers for EIA Regulations, etc.	Maintain or improve ecological and tourism functionality of a PA or WHS.
ESA: Protected Area Buffer	Unless otherwise stated, this represents an area extending 5km from the PAs or where applicable PA specific delineated buffers.	Maintain or improve ecological and tourism functionality of a PA.
ESA: World Heritage Site Buffer	Unless otherwise stated, this represents an area extending 10km from the WHS or where applicable area specifically defined for WHS.	Maintain or improve ecological and tourism functionality of WHS.



Map Category	Guiding Description of Categories	Land-Use Management Objective
Terrestrial ESAs	Functional but not necessarily entirely natural terrestrial that are largely required to ensure the persistence and maintenance of biodiversity patterns and ecological processes within the Critical Biodiversity Areas. The area also contributes significantly to the maintenance of Ecological Infrastructure (EI).	Maintain ecosystem functionality and connectivity allowing for some loss of biodiversity
Terrestrial ESAs: Species specific	Modified but area is providing a support function to a threatened or protected species.	Maintain current land use or rehabilitate back to functional natural area.
Aquatic Ecological Support Areas	Functional but not necessarily entirely natural aquatic landscapes that are largely required to ensure the persistence and maintenance of biodiversity patterns and ecological processes within the Critical Biodiversity Areas. The area also contributes significantly to the maintenance of Ecological Infrastructure (EI).	Maintain ecosystem functionality allowing for some loss of biodiversity but without degrading Present Ecological State (PES) category.
Natural Biodiversity Areas	All natural areas not already included in the above categories.	Maintain basic ecosystem functionality.
Modified	Areas with no significant natural vegetation remaining and therefore regarded as having a low biodiversity value (e.g. areas under cultivation).	Sustainable management

For the purposes of this report, only aquatic Critical Biodiversity Areas (CBAs) and Ecological Support Areas (ESAs) are relevant. However, the associated spatial data layers are currently under development and are not yet available for distribution. As a result, these features are not illustrated in this report.

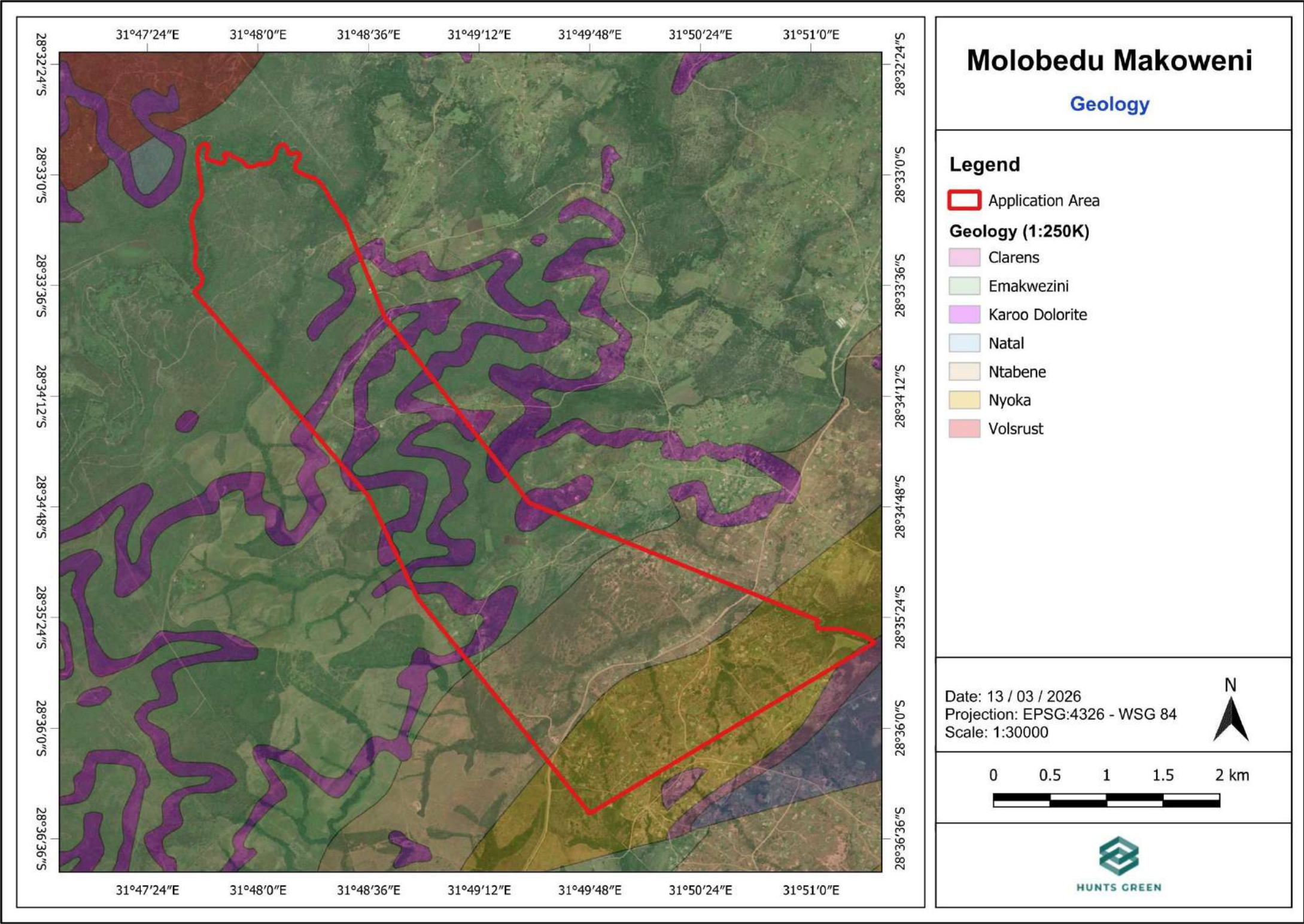


Figure 6-2: The geology of the Application Area

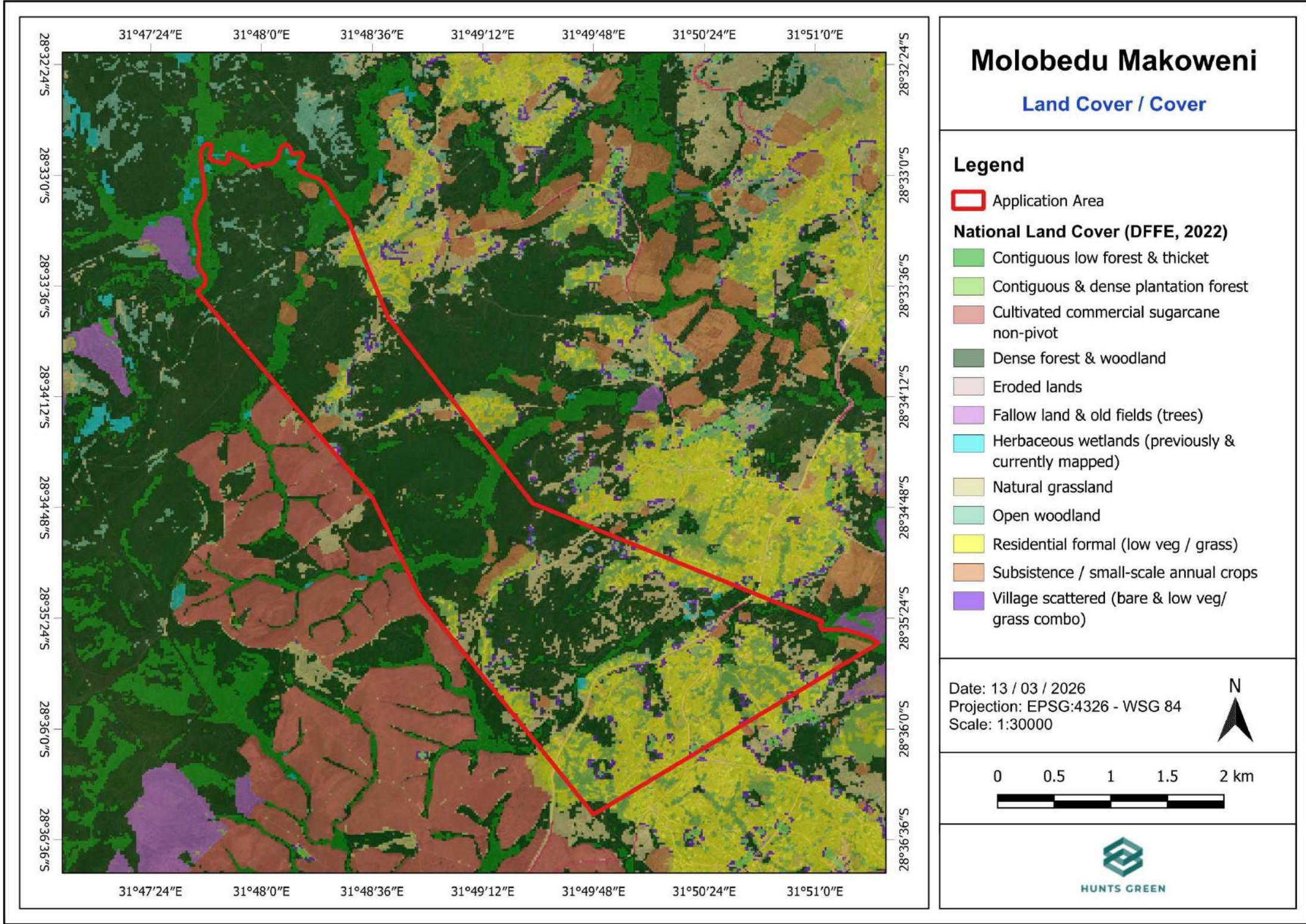


Figure 6-3: Land cover of the Application Area

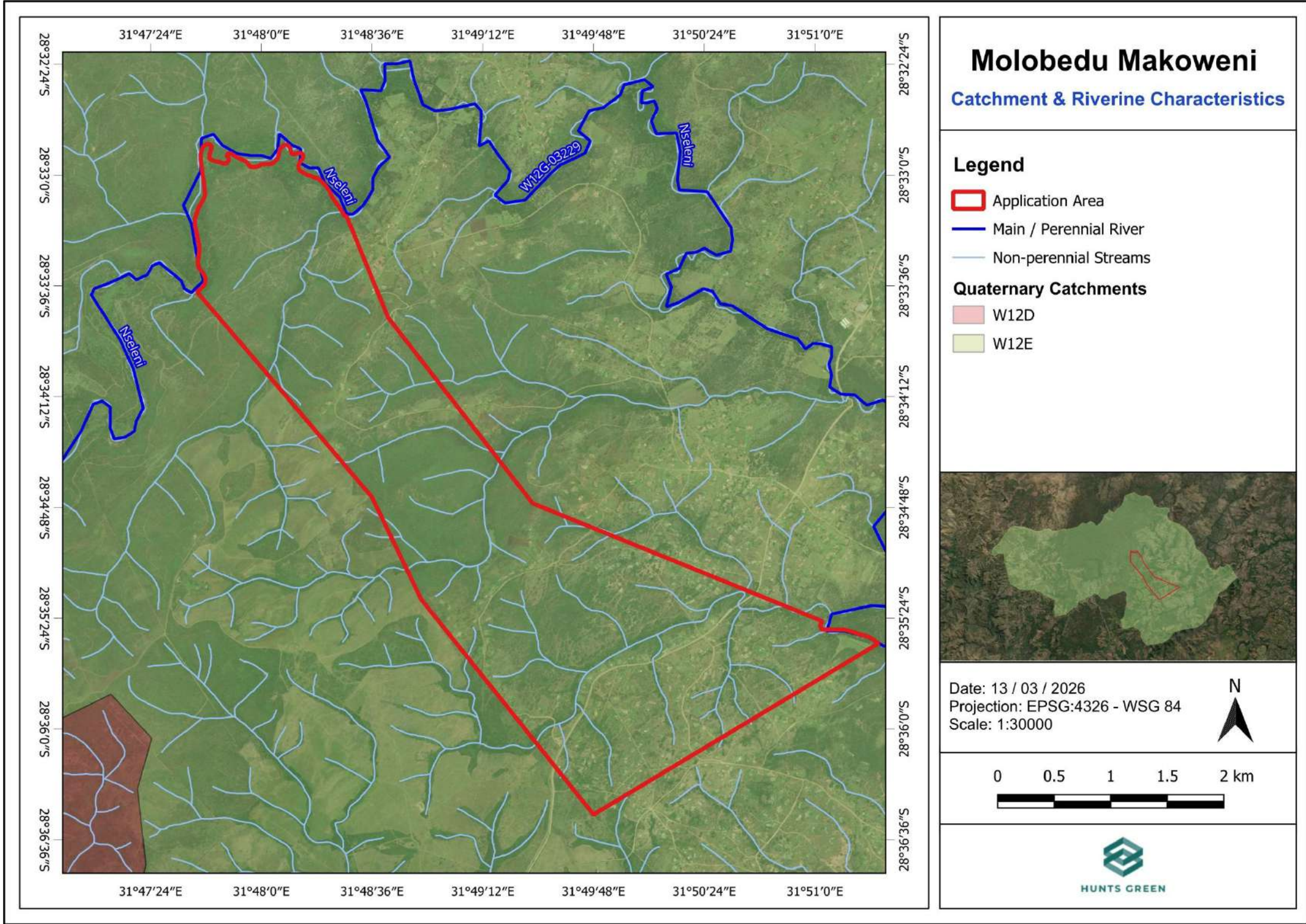


Figure 6-4: Catchment and riverine characteristics of the Application Area and surrounding areas

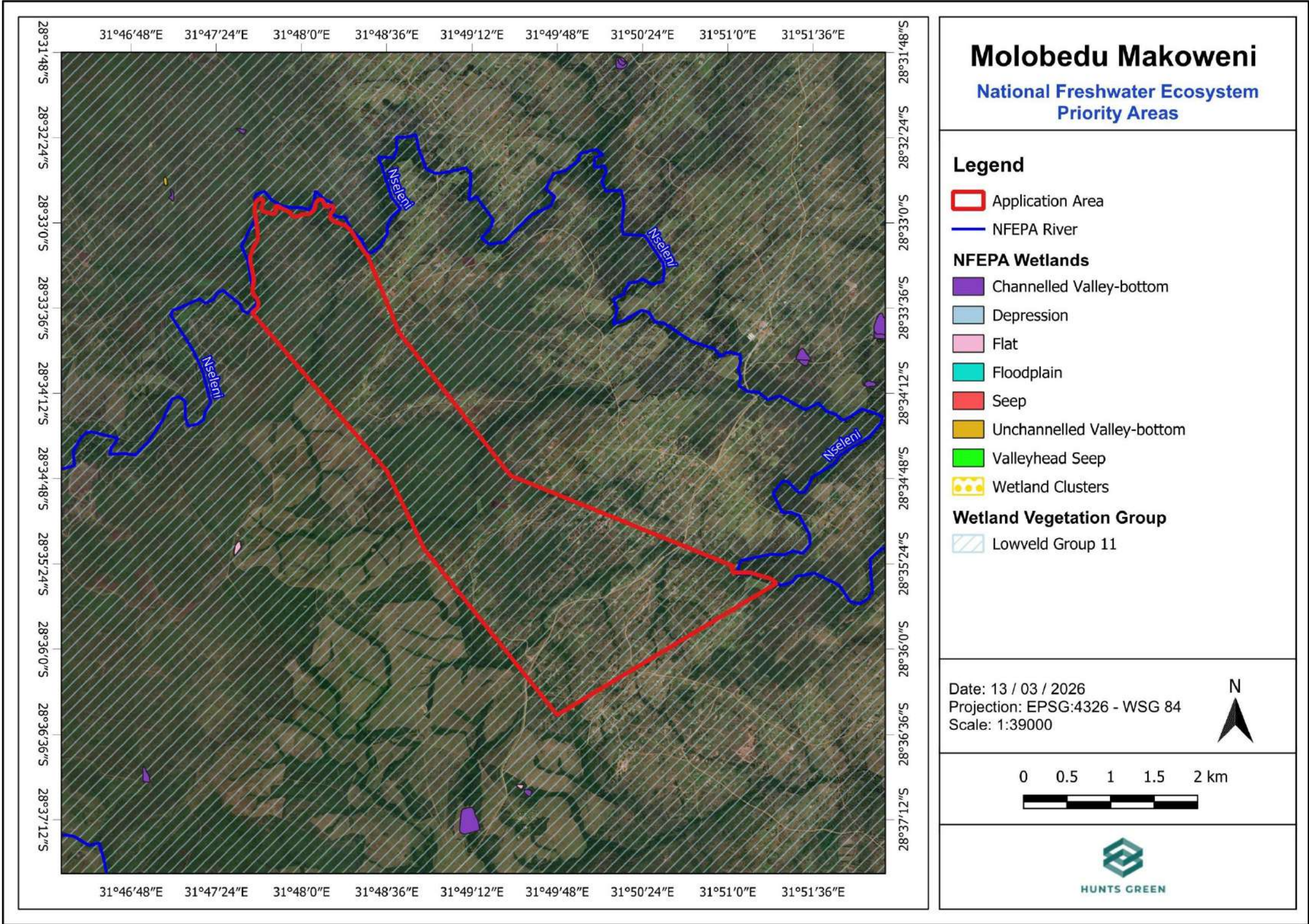


Figure 6-5: National Freshwater Ecosystem Priority Areas (NFEPA) within the Application Area

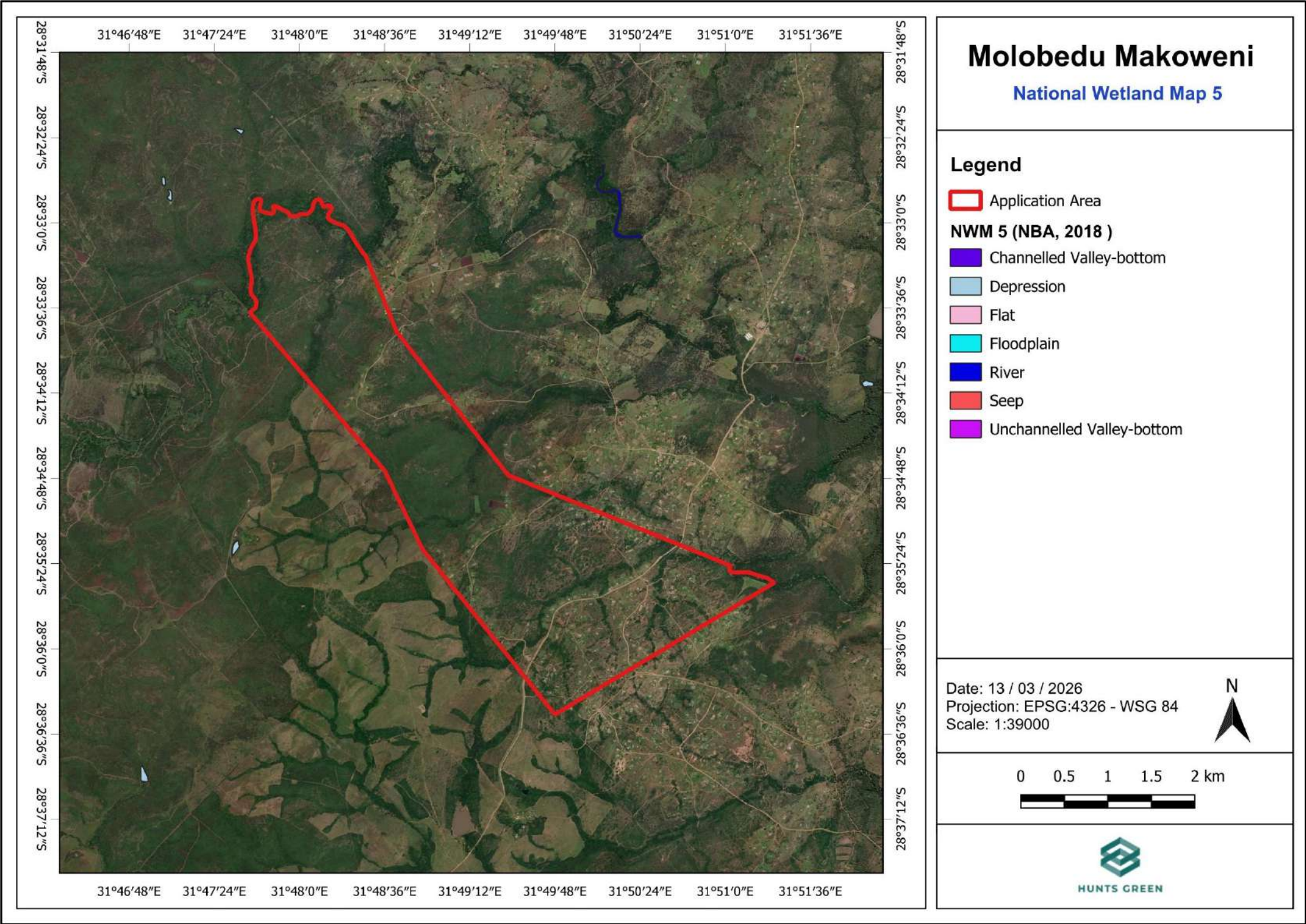


Figure 6-6: National Weland Map version 5 (NWM5) within the Application Area



6.10 Results of the Screening Tool Report

The following information is derived from the National Web-based Environmental Screening Tool, in accordance with Regulation 16(1)(v) of the Environmental Impact Assessment Regulations, 2014 (as amended). The Screening Tool map for the Aquatic Biodiversity Theme Sensitivity indicate that the proposed development area is classified as "Very High" sensitivity category. This is due to the presence of a river.

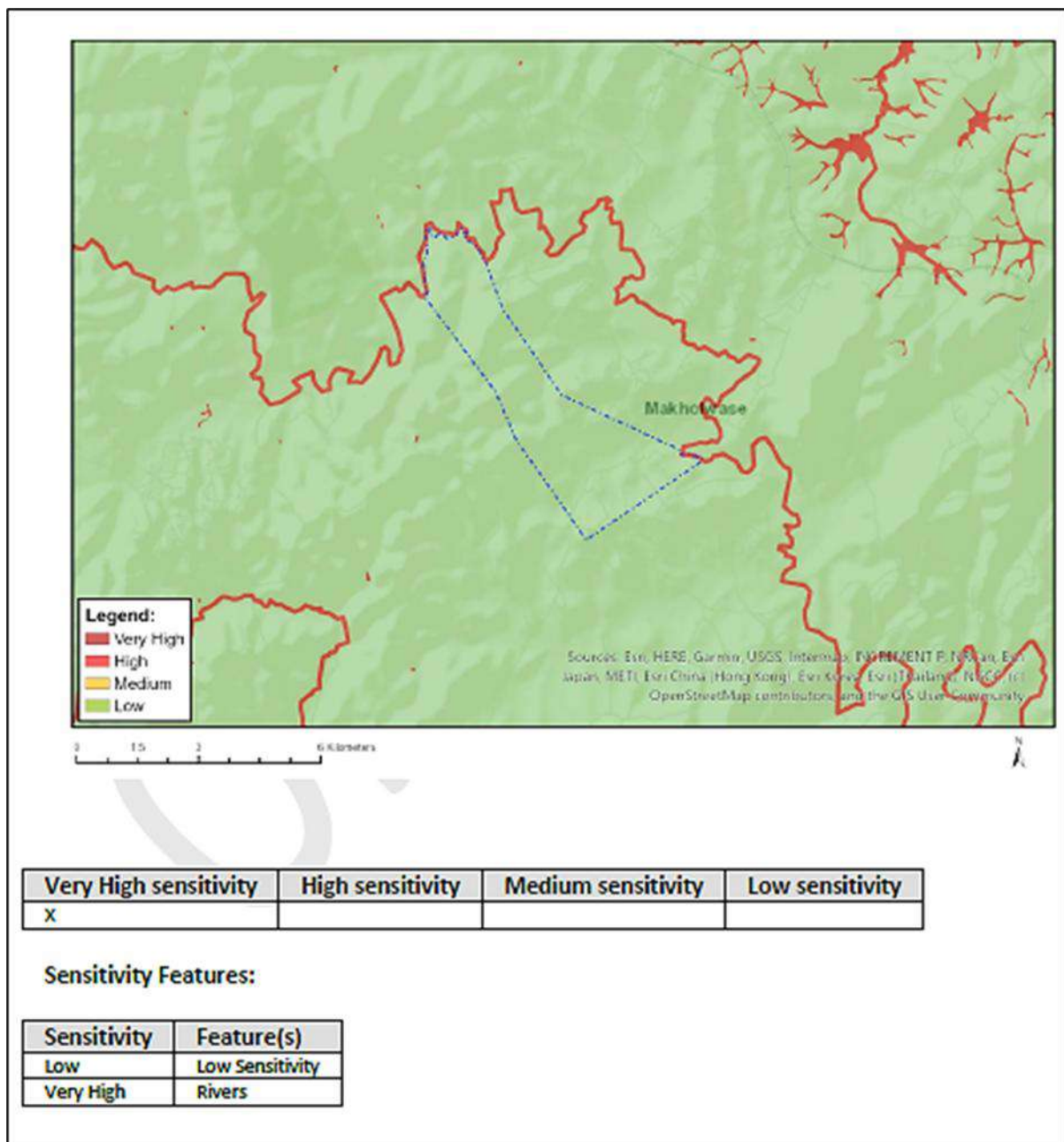


Figure 6-7: Map of Aquatic Biodiversity theme sensitivity for the Application Area, as taken from the Screening Tool Report compiled for the project



7 Results

7.1 Wetland Classification and Delineations

The wetland assessment focused primarily on the specific areas within the Application Area designated for project-related activities, rather than the entire Application Area. These areas included locations proposed for equipment laydown and movement, mobile offices, a bunded area, parking facilities, temporary sanitation facilities, drilling equipment and associated infrastructure, as well as the use, upgrading, or construction of new access routes where necessary to facilitate site access and operational requirements.

The field investigation aimed to verify the presence of wetlands within the proposed Application Area and the adjacent 500 m regulated zone. Based on the site assessment and a review of project mapping, no wetlands were identified within either the Application Area or the 500 m regulated area. The features identified during the site assessment were classified as rivers and streams and were therefore excluded from a functionality assessment, as their ecological condition must be evaluated separately through a Present Ecological State (PES) assessment within the framework of an aquatic biodiversity study. However, the riparian ecological integrity of these systems was considered through an assessment of the riparian zones associated with the identified rivers and streams.

7.2 Riparian Habitats and Delineations

The riparian zone, or riparian area, of a watercourse is the land directly adjacent to the active channel (e.g., the riverbanks), influenced by watercourse-related processes. These areas are typically characterised by alluvial or hydric soils and vegetation distinct in composition and structure from surrounding land areas. According to Ollis *et al.* (2013), the riparian zone is generally located between the outer edge of the active channel and the outer edge of the macro-channel.

Riparian zones play a vital role in protecting and enhancing water resources by storing water to prevent floods, stabilising stream banks to reduce erosion, and improving water quality through the filtration of sediments and nutrients. They regulate water temperatures by providing shade, support aquatic species, and offer essential habitats for foraging, roosting, and nesting wildlife. Additionally, riparian zones act as critical dispersal and migration corridors for various species and serve as natural buffers between aquatic ecosystems and adjacent land uses, mitigating the impacts of human activities.

A desktop and field assessment identified and delineated streams and their associated riparian habitats within the Application Area. The riparian areas associated with these streams were generally dense, comprising woody indigenous trees together with terrestrial vegetation (Figure 7-1). The delineated area only considered areas overlap with locations designated for equipment laydown and movement, mobile offices, a bunded area, parking facilities, temporary sanitation facilities, and spaces required for drilling equipment and associated trucks. The assessment also considered the use, upgrading, or construction of new access routes where necessary to facilitate site access and operational requirements (Figure 7-2).



Figure 7-1: Riparian area and stream identified within the Application Area

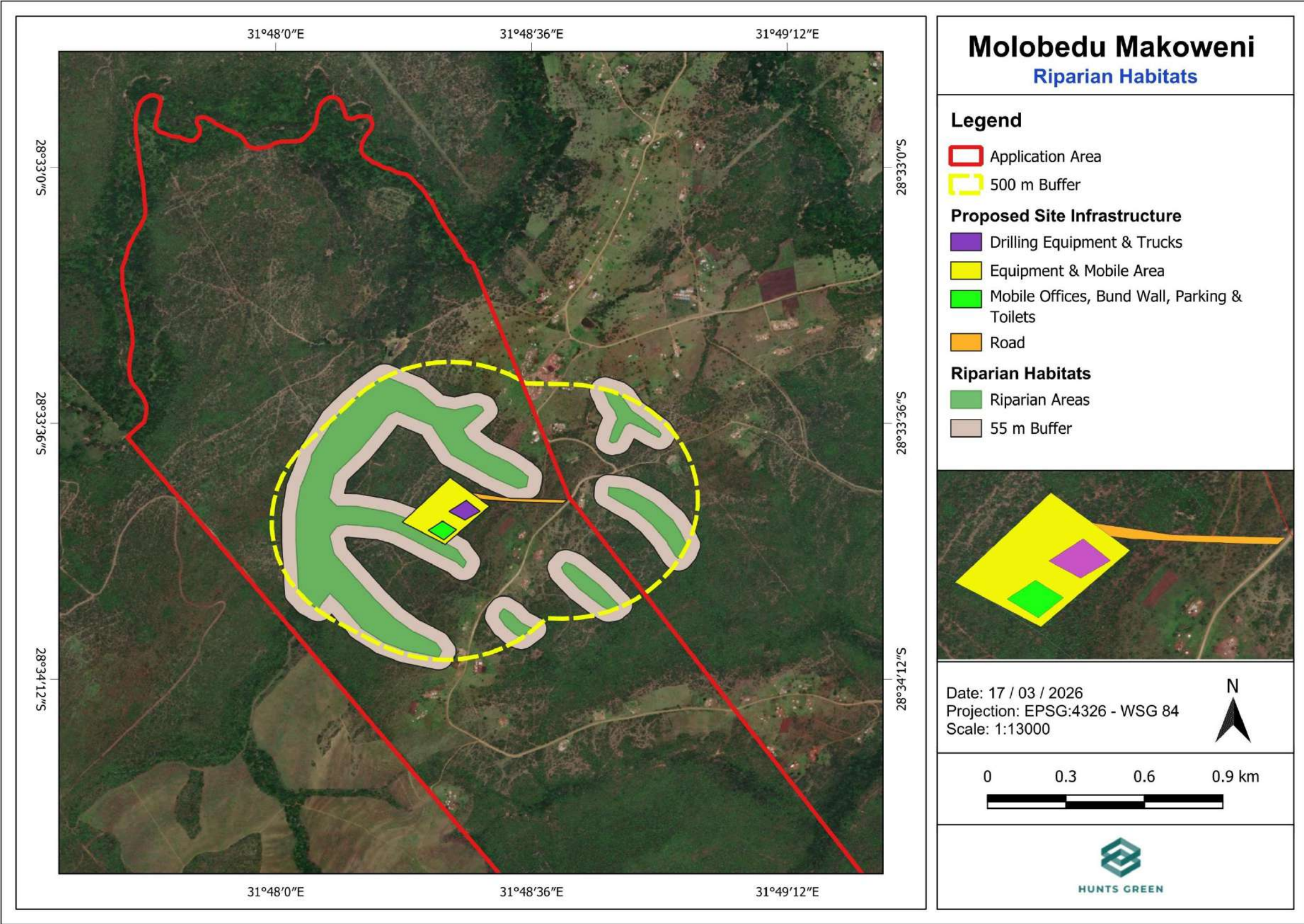


Figure 7-2: Riparian areas delineated in relation to proposed infrastructure within the Application Area



7.3 Vegetation Indicator

During the various assessments of the study area, the various riparian vegetation components were assessed. The vegetation species composition across the project site was largely homogeneous, with several woody trees' species and plants such as *Dichrostachys cinerea*, *Vachellia spp.*, *Bridelia micrantha*, *Albizia adianthifolia*, *Ficus sycomorus*, *Nuxia oppositifolia* and *Syzygium cordatum*, playing a crucial role in the riparian delineation process. Some examples of the riparian vegetation are illustrated in the Figure 7-3 below. The riparian zones of the identified streams were generally dense, with woody indigenous tree species occurring in conjunction with surrounding terrestrial vegetation. Aquatic vegetation within the identified streams was generally scarce, likely reflecting their ephemeral nature, with channels remaining dry for extended periods and flowing only during the wet season following significant rainfall events.



Figure 7-3: Some riparian vegetation

7.4 Alluvial Soil

Alluvial soils, found in floodplains and along riverbanks, are nutrient-rich and fertile, making them ideal for supporting riparian vegetation. These soils, formed by the deposition of sediment from flowing water, can vary in texture from sandy to clayey, influencing water retention and drainage. Riparian plants and woody trees or shrubs and various grasses, thrive in these areas due to the soil's ability to retain moisture and provide essential nutrients.

The vegetation in these zones plays a key role in stabilising banks, reducing erosion, enhancing biodiversity, and improving water quality by filtering pollutants. Additionally, riparian areas often have recent deposits of sand, silt, or clay, set down by flowing water (Figure 7-4).



While these deposits are not always used as a primary indicator for delineating riparian areas, they can help confirm topographical and vegetation indicators, supporting the identification of these ecologically important zones.



Figure 7-4: Alluvial soil used as indicators for riparian conditions on the Application Area

7.5 Riparian Ecological Integrity

The riparian ecological integrity of the riverine systems was assessed using the Riparian Vegetation Response Assessment Index (VEGRAI) (Kleynhans *et al.*, 2007) Level 3. The project site encompasses riparian habitats along most of the non-perennial streams within its boundary. The vegetation is evergreen and lush throughout the year. The majority of the identified streams were dry at the time the assessment was conducted. The riparian habitats along the non-perennial streams are intact and minimal impacts such as vehicle and foot pathways were observed.

The results obtained for the riparian habitats associated with the streams are shown in (Table 7-1). Riparian habitats were all categorised as Moderately Modified (PES C).

Table 7-1: Riparian Ecological Scores

No. of Channels	Type of Channel	Score (%)	Ecological Category
1 to 5	Non-perennial Streams	75.3	C

7.6 Buffer Recommendations

As a mitigation measure for the proposed prospecting development, a buffer zone has been established to protect the riparian habitats. A 55 m buffer is recommended to help preserve



their ecological integrity, maintain hydrological functioning, and reduce the potential impacts of prospecting activities.

It is important that a 55 m buffer be maintained for prospecting activities occurring near streams within the entire Application Area.

7.7 Site Sensitivity Verification Statement

Based on the confirmed habitat assessment and field survey findings, the specialist disagrees with the Screening Tool's initial classification of Very High aquatic theme sensitivity. Despite the absence of ground- and surface strategic water source areas, wetland and NFEPA features, aquatic Critical Biodiversity Areas (CBAs) and Ecological Support Areas (ESAs) within the focused footprint, the aquatic sensitivity may still be regarded as Very High due to the presence of riparian habitat and watercourses.. Riparian areas are of high ecological importance, providing essential ecosystem functions and supporting biodiversity.

8 Impact and Risk Assessment

8.1 Impact Assessment

An Impact Assessment in the context of environmental and developmental projects is a structured and systematic process used to evaluate the potential consequences, both positive and negative, of a proposed action or development on the environment, society, and the economy. The assessment must comply with the minimum requirements set out in the EIA Regulations, 2014 (as amended), while also considering any relevant official guidelines.

It is important to note that a disturbance can be temporary, such as an accidental spill, yet its effects may persist over a much longer period, for example through the infiltration of pollutants into groundwater sources. The assessment and rating procedure outlined in Section 4.7 focuses on the impacts and consequences of such disturbances on the environment, rather than merely on the initial cause.

To minimise adverse effects, specific mitigation measures are proposed, along with practical and achievable actions to reduce negative impacts. This assessment considers not only the 'worst-case' scenarios but also the cumulative impacts that may arise from the proposed activities.



Table 8-1: Risk impacts and ratings of the proposed developmental activities in the construction phase

Nature of the Impact	Status		Extent	Probability	Reversibility	Irreplaceability	Duration	Cumulative Effect	Magnitude	Impact Significance	Impact Rating	Mitigation Measures
Construction / Site Establishment Phase												
Vegetation clearing for drill pads and access routes may result in the loss of riparian vegetation and the disturbance of sensitive aquatic habitats.	Before mitigation	Negative	1	3	4	4	1	3	3	48	Medium (29-50)	Avoid riparian zones; maintain a minimum 55 m buffer around wetlands; demarcate no-go areas before clearing; limit clearing to the smallest footprint necessary. Utilisation of existing access routes, and the relocation of infrastructure to already disturbed areas where feasible.
	After mitigation	Negative	1	2	2	1	1	1	1	8	Low (6-28)	
Earthworks and site preparation may disturb soils, leading to increased erosion and the potential transport of sediment into nearby watercourses.	Before mitigation	Negative	1	2	2	2	2	2	2	28	Low (6-28)	Implement erosion and sediment control measures (e.g., silt fences, berms, sediment traps); schedule earthworks during dry periods; stabilise exposed soils promptly.
	After mitigation	Negative	1	2	2	1	2	2	2	20	Low (6-28)	
Movement of heavy machinery may result in soil compaction, reducing infiltration and increasing surface runoff into adjacent watercourses.	Before mitigation	Negative	1	2	2	2	2	2	2	22	Low (6-28)	Restrict machinery to designated routes; avoid wetland soils and saturated areas; rehabilitate compacted soils after construction.
	After mitigation	Negative	1	1	2	2	2	2	1	10	Low (6-28)	
The storage and handling of fuels and lubricants pose a risk of accidental spills, which may contaminate watercourses.	Before mitigation	Negative	1	2	2	1	2	2	2	20	Low (6-28)	Store fuels in banded areas away from wetlands; refuel in designated areas with spill kits available; implement spill response procedures and training.
	After mitigation	Negative	1	2	2	1	1	2	2	18	Low (6-28)	



Table 8-2: Risk impacts and ratings of the proposed developmental activities in the operational phase

Nature of the Impact	Status		Extent	Probability	Reversibility	Irreplaceability	Duration	Cumulative Effect	Magnitude	Impact Significance	Impact Rating	Mitigation Measures
Operational Phase												
Drilling activities and borehole establishment may disturb soils and result in sediment runoff into nearby watercourses.	Before mitigation	Negative	1	3	4	4	1	3	3	48	Medium (29-50)	Locate drill pads outside wetland buffers; stabilise drill sites; contain and properly manage drill cuttings and wastewater.
	After mitigation	Negative	1	4	1	1	3	3	1	13	Low (6-28)	
Use and storage of drilling fluids or chemicals Potential contamination of surface water and riparian soil if spills occur.	Before mitigation	Negative	1	2	2	1	2	2	2	20	Low (6-28)	Store chemicals in secure, bunded containers; ensure proper handling procedures; immediately contain and clean up any spills.
	After mitigation	Negative	1	2	2	1	3	2	2	22	Low (6-28)	
Increased vehicle movement may disturb riparian areas, cause soil compaction, and lead to erosion along informal tracks. Also, transport seeds of alien plants into previously intact riparian buffer areas.	Before mitigation	Negative	1	3	3	1	3	3	1	14	Low (6-28)	Limit vehicle movement to existing roads and designated tracks; prohibit off-road driving within wetland buffers; implement speed restrictions; Restrict movement to designated routes; monitor disturbed areas regularly for invasive species.
	After mitigation	Negative	1	2	2	1	2	2	1	10	Low (6-28)	
Temporary water abstraction for drilling may reduce local water availability, potentially affecting riparian hydrology and stream flow.	Before mitigation	Negative	1	2	2	1	3	2	1	11	Low (6-28)	Minimise water abstraction; obtain required permits; monitor abstraction volumes to avoid impacts on wetland hydrology and stream flow.
	After mitigation	Negative	1	1	1	1	2	1	1	7	Low (6-28)	



Stockpiling of drill cuttings and waste material may result in sediment or contaminants being transported into watercourses.	Before mitigation	Negative	1	3	3	1	3	3	1	14	Low (6-28)	Store materials away from wetlands; stabilise stockpiles; cover or contain materials during rainfall events.
	After mitigation	Negative	1	2	2	1	2	2	1	10	Low (6-28)	

Table 8-3: Risk impacts and ratings of the proposed mining activities in the decommissioning phase

Nature of the Impact	Status	Extent	Probability	Reversibility	Irreplaceability	Duration	Cumulative Effect	Magnitude	Impact Significance	Impact Rating	Mitigation Measures
The removal of equipment and temporary infrastructure may cause temporary disturbances of soil and vegetation in the surrounding area.	Before mitigation	Negative	2	2	2	2	1	2	22	Low (6-28)	Remove all infrastructure carefully; avoid additional disturbance to wetlands and riparian areas.
	After mitigation	Negative	1	2	2	1	1	1	8	Low (6-28)	
The sealing and closure of boreholes carries a risk of sediment disturbance if not properly managed.	Before mitigation	Negative	2	2	3	2	1	2	24	Low (6-28)	Properly seal and rehabilitate boreholes according to regulatory guidelines to prevent contamination pathways.
	After mitigation	Negative	1	2	2	2	1	2	20	Low (6-28)	
Implementation of rehabilitation measures for impacted watercourses.	Before mitigation	Positive	1	4	1	3	3	2	26	Low (6-28)	Implement rehabilitation with indigenous vegetation; recontour and stabilise soils; monitor recovery of wetland and riparian vegetation. remove any invasive plants manually. avoid unnecessary soil disturbance to reduce invasion opportunities.
	After mitigation	Positive	2	4	1	3	3	2	28	Low (6-28)	



8.2 Cumulative Impact

Streams and associated riparian vegetation are especially vulnerable, as they form transitional zones that regulate hydrology, stabilise banks, filter sediments, and support high biodiversity. Construction activities such as access road development, drill pad establishment, vegetation clearing, and earthworks within or adjacent to drainage lines may destabilise streambanks, remove protective riparian vegetation, and increase sediment loads. This can result in channel incision, bank erosion, and siltation of instream habitats, ultimately reducing aquatic habitat quality and disrupting ecological processes. The loss or thinning of riparian vegetation further diminishes shading, leading to increased water temperatures and altered microhabitat conditions, which can negatively affect aquatic biota.

The adjacent terrestrial vegetation, which contributes to catchment stability and hydrological regulation, may also be cleared or fragmented during construction. This reduces infiltration capacity and increases surface runoff, thereby intensifying sediment transport into streams and wetlands. Fragmentation of terrestrial habitats also disrupts ecological corridors, limiting species movement between riparian and upland areas and reducing overall landscape connectivity.

During the operational phase, ongoing disturbances such as vehicle movement, maintenance activities, and potential water abstraction may further alter natural flow regimes. Reduced baseflows and altered hydroperiods can stress both wetlands and streams, particularly in systems that are already seasonal or ephemeral. Runoff containing sediments, hydrocarbons, or chemical residues may enter drainage lines, degrading water quality and affecting both aquatic organisms and riparian plant communities. Disturbed riparian and terrestrial areas are also more susceptible to invasion by alien plant species, which can outcompete indigenous vegetation, reduce biodiversity, and alter fire and hydrological regimes.

Cumulatively, these impacts can lead to the progressive degradation of riparian zones, reducing their ability to function as effective buffers between terrestrial and aquatic systems. As riparian vegetation becomes simplified or replaced by invasive species, its capacity to trap sediments, stabilise soils, and regulate water flow is diminished. This creates a feedback loop where increased erosion and sedimentation further degrade stream condition.

During decommissioning, although rehabilitation efforts aim to restore disturbed areas, inadequate or poorly managed rehabilitation may result in persistent impacts. Altered topography, compacted soils, and disrupted soil profiles can prevent the re-establishment of natural hydrological pathways, limiting the recovery of both riparian and terrestrial vegetation. If indigenous riparian species fail to re-establish, streambanks may remain unstable and vulnerable to erosion, prolonging sediment inputs into the system. Additionally, residual contamination and the slow recovery of vegetation structure may delay the return of ecological function and biodiversity.

Overall, the cumulative effect of these pressures across all project phases is likely to reduce the ecological integrity of streams, riparian zones, and associated terrestrial habitats. Intact systems may become increasingly modified, while already degraded systems may shift toward



higher levels of ecological dysfunction. This includes compromised hydrological regulation, reduced water quality, loss of habitat complexity, and diminished biodiversity. Given the critical role of riparian zones as ecological linkages and buffers, their degradation has disproportionate consequences for the broader landscape, reinforcing the need for stringent management and protection measures throughout the project lifecycle.

8.3 Risk Assessment

The risk assessment considered both direct and indirect impacts, if any, to the wetland systems. The mitigation hierarchy as discussed by the Department of Environmental Affairs (2013) will be considered for this component of the assessment (see below). In accordance with the mitigation hierarchy, the preferred mitigatory measure is to avoid impacts by considering options in project location, sitting, scale, layout, technology and phasing to avoid impacts. In the case of this project, no detailed project layout was provided. Therefore, avoidance and prevent will be considered if avoidance is not an option.

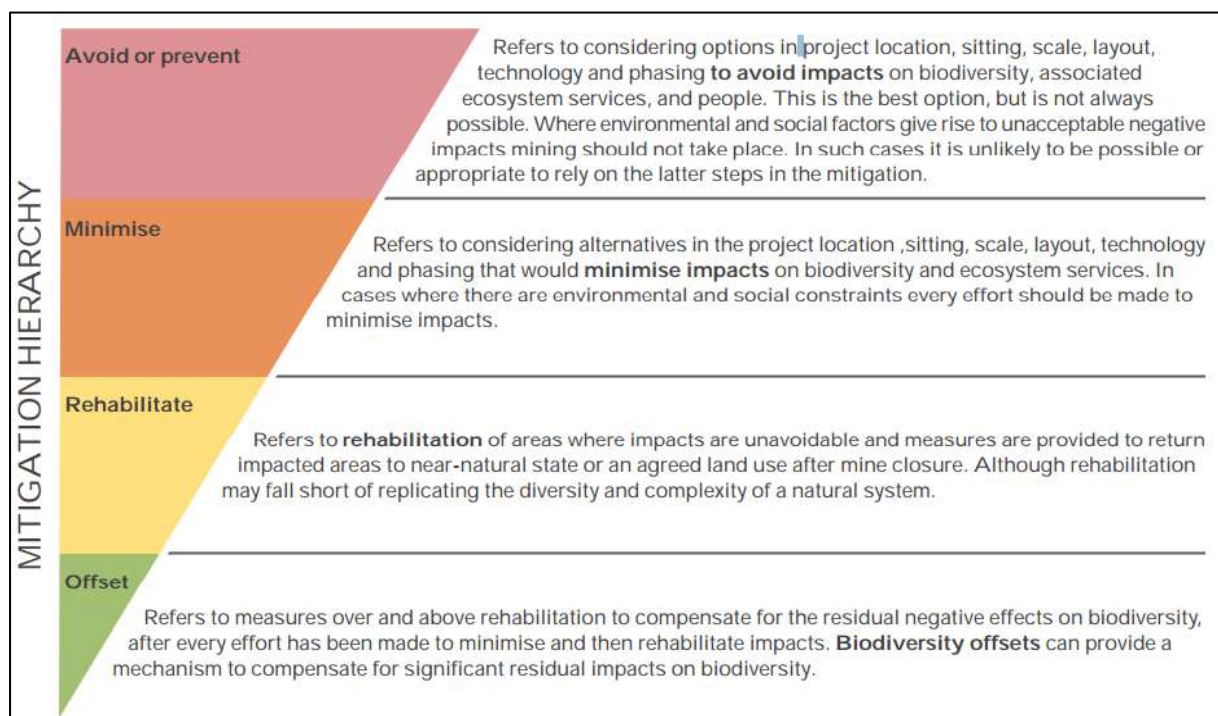


Figure 8-1: The mitigation hierarchy as described by the DEA (2013)

Based on the Risk Assessment provided in Appendix B; the proposed infrastructure footprints were found to pose a Moderate Risk (post-mitigation) to identified watercourses. This is primarily due to the proposed infrastructure overlapping with one of the identified streams.

Although mitigation measures are expected to reduce the severity of direct impacts, the placement of infrastructure within or in close proximity to the stream introduces residual risks, including potential disturbance to channel morphology, increased sedimentation, and degradation of riparian vegetation. These impacts may, in turn, affect flow dynamics, water quality, and the ecological functioning of the stream system.



Given the sensitivity of stream and riparian environments, even limited disturbance within these areas can result in disproportionate ecological effects. As such, the Moderate risk rating reflects the likelihood of residual impacts persisting despite the implementation of standard mitigation measures, particularly where complete avoidance of the stream is not achieved.

9 Conclusions and Recommendations

An assessment was undertaken to identify and evaluate the potential ecological impacts on streams within the Application Area in relation to the proposed prospecting activities. The impact and risk evaluation indicates that, with the implementation of appropriate mitigation measures, the streams and associated riparian areas are anticipated to be associated with a Moderate risk prior to strict avoidance and mitigation.

This Moderate Risk is primarily associated with the proximity and partial overlap of proposed infrastructure with stream channels and their riparian zones, which are highly sensitive and play a critical role in maintaining hydrological and ecological functioning. Potential impacts include disturbance to channel morphology, degradation of riparian vegetation, increased sedimentation, and reduced water quality.

The overall risk can, however, be reduced to Low, provided that strict avoidance measures are implemented. This includes the demarcation, establishment, and ongoing maintenance of a minimum 55 m buffer zone around all streams, within which no prospecting-related infrastructure or activities should occur. These buffer zones are essential to protect riparian vegetation, maintain bank stability, and preserve natural flow regimes.

Furthermore, it is strongly recommended that all proposed infrastructure (e.g., access roads, drill pads, and associated facilities) be repositioned outside of sensitive aquatic and riparian areas, particularly given that this is a prospecting right application where flexibility in layout is typically feasible. Preference should be given to locating infrastructure within already disturbed areas, such as near existing residential or village zones, where vegetation has already been cleared and access roads are present.

For drilling activities specifically, the use of existing access roads should be prioritised to minimise additional disturbance, and all activities should be located as far as practicable outside of the 55 m buffer, thereby reducing direct and indirect impacts on streams and riparian systems.

9.1 Reasoned Opinion of the Specialist

It is the opinion of the specialist that the proposed activities can be considered acceptable from an ecological perspective, provided that strict avoidance measures are implemented. This includes the establishment and maintenance of a minimum 55 m buffer around all wetlands and streams, the utilisation of existing access routes, and the relocation of infrastructure to already disturbed areas where feasible.



10 Details of Specialist

This Specialist Report has been compiled by the following specialists:

Table 14-1: Details of the Specialist(s) who prepared this Report

Responsibility	Fieldwork, Data Analysis and Report Writing
Full Name of Specialist	Julia Ndou
Highest Qualification	MSc Aquatic Health (Zoology)
Professional Accreditation	133433 (Professional Natural Scientist)
Years of experience in specialist field	>5

Declaration of the Specialist

I, **Julia Ndou**, as the appointed specialist hereby declare/affirm the correctness of the information provided or to be provided as part of the application, and that I:

- in terms of the general requirement to be independent;
- other than fair remuneration for work performed/to be performed in terms of this application, have no business, financial, personal or other interest in the activity or application and that there are no circumstances that may compromise my objectivity; or
- am not independent, but another specialist that meets the general requirements set out in Regulation 13 have been appointed to review my work (Note: a declaration by the review specialist must be submitted);
- in terms of the remainder of the general requirements for a specialist, am fully aware of and meet all of the requirements and that failure to comply with any the requirements may result in disqualification;
- have disclosed/will disclose, to the applicant, the Department and interested and affected parties, all material information that have or may have the potential to influence the decision of the Department or the objectivity of any report, plan or document prepared or to be prepared as part of the application;
- have ensured/will ensure that information containing all relevant facts in respect of the application was/will be distributed or was/will be made available to interested and affected parties and the public and that participation by interested and affected parties



was/will be facilitated in such a manner that all interested and affected parties were/will be provided with a reasonable opportunity to participate and to provide comments;

- have ensured/will ensure that the comments of all interested and affected parties were/will be considered, recorded and submitted to the Department in respect of the application;
- have ensured/will ensure the inclusion of inputs and recommendations from the specialist reports in respect of the application, where relevant;
- have kept/will keep a register of all interested and affected parties that participate/d in the public participation process; and
- I am aware that a false declaration is an offence in terms of regulation 48 of the 2014 NEMA EIA Regulations.

Signature of the Specialist

Julia Ndou

Full Name and Surname of the Specialist

Hunts Green Consulting

Name of Company

18th of March 2026

Date



11 Details of Reviewer

This Specialist Report has been compiled by the following specialists:

Table 11-1: Details of the Specialist(s) who prepared this Report

Responsibility	Technical Reviewer
Full Name of Specialist	Khume Mtshweni
Highest Qualification	MSc Aquatic Health
Professional Registration	138592(Professional Natural Scientist)
Years of experience in specialist field	>8

Declaration of the Specialist

I, **Khume Mtshweni**, as the appointed specialists hereby declare/affirm the correctness of the information provided or to be provided as part of the application, and that I:

- in terms of the general requirement to be independent:
- other than fair remuneration for work performed/to be performed in terms of this application, have no business, financial, personal or other interest in the activity or application and that there are no circumstances that may compromise my objectivity; or
- am not independent, but another specialist that meets the general requirements set out in Regulation 13 have been appointed to review my work (Note: a declaration by the review specialist must be submitted);
- in terms of the remainder of the general requirements for a specialist, am fully aware of and meet all of the requirements and that failure to comply with any the requirements may result in disqualification;
- have disclosed/will disclose, to the applicant, the Department and interested and affected parties, all material information that have or may have the potential to influence the decision of the Department or the objectivity of any report, plan or document prepared or to be prepared as part of the application;
- have ensured/will ensure that information containing all relevant facts in respect of the application was/will be distributed or was/will be made available to interested and affected parties and the public and that participation by interested and affected parties was/will be facilitated in such a manner that all interested and affected parties were/will be provided with a reasonable opportunity to participate and to provide comments;



- have ensured/will ensure that the comments of all interested and affected parties were/will be considered, recorded and submitted to the Department in respect of the application;
- have ensured/will ensure the inclusion of inputs and recommendations from the specialist reports in respect of the application, where relevant;
- have kept/will keep a register of all interested and affected parties that participate/d in the public participation process; and
- I am aware that a false declaration is an offence in terms of regulation 48 of the 2014 NEMA EIA Regulations.

Signature of the Specialist

Khume Mtshweni **Full Name and Surname of the Specialist**

Hunts Green Consulting

Name of Company

27th of March 2026

Date



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13 Appendix A: Risk Matrix

PROJECT: WETLAND IMPACT ASSESSMENT IN SUPPORT OF THE PROSPECTING RIGHT APPLICATION OF COAL ON LOT 289 EMPANGENI 13389 GU AND LOT 285 EMPANGENI 13400 GU IN KING CETSHWAYO DISTRICT MUNICIPALITY, KWA-ZULU NATAL PROVINCE

RISK ASSESSMENT MATRIX for Section 21 (c) and (i) Water Use activities - Version 2.1.1

Name of Assessor: Julia Ndou / Khume Mtshweni

SACNASP Registration Number: 133433 / 138592

Date of assessment: 18-Mar-26

Phase	Activity	Impact	Intensity of Impact on Resource Quality						Overall Intensity (max = 10)	Spatial scale (max = 5)	Duration (max = 5)		Severity (max = 20)	Importance rating (max = 5)		Consequence (max = 100)		Likelihood (Probability) of impact		Significance (max = 100)	Risk Rating	Confidence level
			Abiotic Habitat (Drivers)			Biota (Responses)																
			Hydrology	Water Quality	Geomorph	Vegetation	Fauna															
CONSTRUCTION	Vegetation clearing for drill pads and access routes	Loss of riparian or wetland vegetation and disturbance of sensitive habitats	5	3	4	5	5	10	3	1	14	3	42	100%	42	M	High					
	Earthworks and site preparation	Soil disturbance leading to erosion and increased sediment entering wetlands and streams	5	3	4	5	5	10	2	2	14	3	42	80%	33.6	M	High					
	Construction of access roads and tracks	Alteration of natural surface runoff patterns and potential fragmentation of wetland or riparian areas	2	2	2	3	3	6	2	2	10	3	30	60%	18	L	Medium					
	Movement of heavy machinery	Soil compaction reducing infiltration and increasing surface runoff into wetlands	2	2	2	3	3	6	2	2	10	3	30	60%	18	L	Medium					
	Storage and handling of fuels and lubricants	Risk of accidental spills contaminating wetland and stream water quality	2	1	1	2	1	4	2	2	8	3	24	60%	14.4	L	Medium					
OPERATIONAL	Drilling activities and borehole establishment	Disturbance of soil and potential sediment runs off into nearby watercourses	3	3	3	3	2	6	3	3	12	3	36	80%	28.8	L	Medium					
	Use and storage of drilling fluids or chemicals	Potential contamination of surface water and wetland soils if spills occur	3	3	2	2	3	6	2	3	11	3	33	80%	26.4	L	Medium					
	Increased vehicle movement	Disturbance of riparian areas, soil compaction, and erosion along informal tracks. Therefore, establishment of alien invasive plant species.	3	2	3	2	2	6	3	3	12	3	36	40%	14.4	L	Medium					
	Temporary water abstraction for drilling	Reduction in local water availability affecting wetland hydrology or stream flow	2	2	2	1	1	4	2	2	8	3	24	80%	19.2	L	Medium					
	Stockpiling of drill cuttings and waste material	Sediment or contaminants entering wetlands and streams through runoff	2	2	2	1	1	4	2	2	8	3	24	80%	19.2	L	Medium					
DECOMMISSIONING	Removal of equipment and temporary infrastructure	Temporary disturbance of soils and vegetation	2	1	2	1	1	4	1	2	7	3	21	60%	12.6	L	Medium					
	Sealing and closure of boreholes	Risk of sediment disturbance if not properly managed	2	2	2	1	1	4	2	2	8	3	24	40%	9.6	L	Medium					

Phase	Activity	Impact		Intensity of Impact on Resource Quality						Overall Intensity (max = 10)	Spatial scale (max = 5)	Duration (max = 5)		Severity (max = 20)	Importance rating (max = 5)		Consequence (max = 100)		Likelihood (Probability of impact)		Significance (max = 100)	Risk Rating	Confidence level
				Abiotic Habitat (Drivers)			Biota (Responses)																
				Hydrology	Water Quality	Geomorph	Vegetation	Fauna															
	Implementation of rehabilitation measures for impacted watercourses	Short-term disturbance but long-term recovery of wetland and riparian ecological function. Mitigation and rehabilitation measures adhered to.		-1	-3	0	-3	-3		0	-1	-5		-6	3		-18		100%		-18	+	High

**RISK RATING TABLES [for Risk Assessment Matrix (version 2.1.1): Section 21 (c) and (i) Water Use Authorisation]****TABLE 1 – IMPORTANCE OF AFFECTED WATERCOURSE/S**

What is the overall importance of the watercourse/s, based on the criteria and guidelines provided below?*

(If no formal assessment of EI / EIS / Wetland Importance has been completed, assign rating according to criterion below that results in the highest score)

Low or Very Low EI / EIS / Wetland Importance rating; OR, If EI/EIS has not been determined, Low rating based on presence of: - no areas identified to be of conservation importance (i.e. OESA at most); and/or - only species/habitats of Least Concern on the IUCN Red List or on a regional/national Red List (including freshwater ecosystem types of Least Concern in terms of the NBA); and/or - only species which are common and widespread and/or habitats of low conservation interest; and/or - highly degraded habitat of extremely small size	Low / Very low = 2	
Medium EI / EIS / Wetland Importance rating; OR, If EI/EIS has not been determined, Moderate rating based on presence of: - CESAs; and/or - species/habitats listed as VU or NT on the IUCN Red List or on a regional/national Red List (including VU/NT freshwater ecosystem types in terms of the NBA); and/or - functionality as an important ecological corridor or buffer area	Moderate = 3	
High EI / EIS / Wetland Importance rating; OR, If EI/EIS has not been determined, High rating based on presence of: - CBA2; and/or - species or degraded habitats (in poor condition) listed as EN or CR on the IUCN Red List or on a regional/national Red List (including EN/CR freshwater ecosystem types in terms of the NBA)	High = 4	
Very high EI / EIS / Wetland Importance rating; OR, If EI/EIS has not been determined, Very high rating based on presence of: -CBA1; and/or - FEPA; and/or - species or intact habitats (in fair or good condition) listed as EN or CR on the IUCN Red List or on a regional/national Red List (including EN/CR freshwater ecosystem types in terms of the NBA); and/or - KBA or IBA or Ramsar site	Very high = 5	

* EI=Ecological Importance; EIS=Ecological Importance and Sensitivity; OESA=Other Ecological Support Areas; IUCN=International Union for Conservation of Nature; CESA=Critical Ecological Support Area; NBA=National Biodiversity Assessment; VU=Vulnerable; NT=Near Threatened; EN=Endangered; CR=Critically Endangered; CBA=Critical Biodiversity Area; FEPA=Freshwater Ecosystem Priority Area; KBA=Key Biodiversity Area; IBA=Important Bird Area.

TABLE 2- INTENSITY OF IMPACT

What is the intensity of the impact on the resource quality (hydrology, water quality, geomorphology, biota)?		
Negative Impacts		
Negligible / non-harmful; no change in PES	0	
Very low / potentially harmful; negligible deterioration in PES (<5% change)	+1	
Low / slightly harmful; minor deterioration in PES (<10% change)	+2	
Medium / moderately harmful; moderate deterioration in PES (>10% change)	+3	
High / severely harmful; large deterioration in PES (by one class or more)	+4	
Very high / critically harmful; critical deterioration in PES (to E/F or F class)	+5	
Positive Impacts		
Negligible; no change in PES	0	
Very low / potentially beneficial; negligible improvement in PES (<5% change)	-1	
Low / slightly beneficial; minor improvement in PES (<10% change)	-2	
Medium / moderately beneficial; moderate improvement in PES (>10% change)	-3	
Highly beneficial; large improvement in PES (by one class or more) and/or increase in protection status	-4	
Very highly beneficial; improvement to near-natural state (A or A/B class) and/or major increase in protection status	-5	
NOTE: Positive Impacts must be given a negative Intensity Score		
*PES of affected watercourses must be considered when scoring Impact Intensity		
TABLE 3 – SPATIAL SCALE (EXTENT) OF IMPACT		
How big is the area that the activity is impacting on, relative to the size of the impacted watercourses?		
Very small portion of watercourse/s impacted (<10% of extent)	1	
Moderate portion of watercourse/s impacted (10-60% of extent)	2	
Large portion of watercourse/s impacted (60-80%)	3	
Most or all of watercourse/s impacted (>80%)	4	
Impacts extend into watercourses located well beyond the footprint of the activities	5	
TABLE 4 – DURATION OF IMPACT		

How long does the activity impact on the resource quality?		
Transient (One day to one month)	1	
Short-term (a few months to 5 years) OR repeated infrequently (e.g. annually) for one day to one month	2	
Medium-term (5 – 15 years)	3	
Long-term (ceases with operational life)	4	
Permanent	5	
TABLE 5 – LIKELIHOOD OF THE IMPACT		
What is the probability that the activity will impact on the resource quality?		
Improbable / Unlikely	20%	
Low probability	40%	
Medium probability	60%	
Highly probable	80%	
Definite / Unknown	100%	
TABLE 6: RISK RATING CLASSES		
RATING	CLASS	MANAGEMENT DESCRIPTION
1 – 29	(L) Low Risk OR (+) Positive (+ +) Highly positive	Acceptable as is or with proposed mitigation measures. Impact to watercourses and resource quality small and easily mitigated, or positive.
30 – 60	(M) Moderate Risk	Risk and impact on watercourses are notable and require mitigation measures on a higher level, which costs more and require specialist input. Licence required.
61 – 100	(H) High Risk	Watercourse(s) impacts by the activity are such that they impose a long-term threat on a large scale and lowering of the Reserve. Licence required.
A low risk class must be obtained for all activities to be considered for a GA		
TABLE 7: CALCULATIONS AND MAXIMUM VALUES		
Intensity = Maximum Intensity Score (negative value for positive impact) X 2	MAX = 10	

Severity = Intensity + Spatial Scale + Duration (<Intensity - Spatial Scale - Duration> for positive impact)	MAX = 20 (MIN = -20 for +ve impacts)	
Consequence = Severity X Importance rating	MAX = 100	
Significance\Risk = Consequence X (Likelihood / 100)	MAX = 100	
RISK ASSESSMENT MUST BE CONDUCTED BY A SACNASP REGISTERED PROFESSIONAL MEMBER AND THE ASSESSOR MUST:		
1) CONSIDER ALL THE RELEVANT PHASES OF PROPOSED ACTIVITIES (CONSTRUCTION AND OPERATIONAL PHASES, AS A MINIMUM);		
2) CONSIDER RISKS TO RESOURCE QUALITY WITH THE PROPOSED CONTROL MEASURES (AS SPECIFIED) ASSUMED TO BE IN PLACE;		
3) CONSIDER THE PRESENT ECOLOGICAL STATUS (PES) AND ECOLOGICAL IMPORTANCE AND SENSITIVITY (EIS) OF THE WATERCOURSE AS RECEPTOR OF RISKS POSED;		
4) RATE POSITIVE IMPACTS/RISKS REDUCTION USING NEGATIVE IMPACT INTENSITY SCORES IN THE RISK ASSESSMENT MATRIX;		
5) INDICATE CONFIDENCE LEVEL OF SCORES PROVIDED IN THE LAST COLUMN AS A CATEGORY (LOW / MEDIUM / HIGH).		
ON THE EXCEL SPREADSHEETS, ROWS THAT ARE NOT NEEDED CAN BE DELETED AND ADDITIONAL ROWS CAN BE ADDED IF REQUIRED		

Client: Vahlengwe Mining Advisory and Consulting (Pty) Ltd

Report Title: WETLAND IMPACT ASSESSMENT IN SUPPORT OF THE PROSPECTING RIGHT

APPLICATION OF COAL ON LOT 289 EMPANGENI 13389 GU AND LOT 285



Document Number: HG01-00-GEN-2026.01.27-r1-REP-VAH118

14 Appendix B: CV of Specialist

CURRICULUM VITAE

NDOU JULIA



PERSONAL DETAILS

Name : Julia Ndou
Profession : Freshwater Specialist
Position : Senior Ecologist & Partner
Year of Experience : 7

SKILLS AND COMPETENCIES

- Conducting fieldwork for aquatic, terrestrial & wetland assessments.
- Compiling aquatic, terrestrial & wetland compliance statements, baseline & impact assessment reports.
- Using GIS applications & analysis of satellite imagery data.
- Assisting in undertaking Water Use Licence Applications (WULAs), Basic Assessments (BAs) & Environmental Impact Assessments (EIAs).
- Compliance monitoring & audit reporting.

QUALIFICATIONS

Julia attained a MSc in Aquatic Health (2020),

BSc Hons in Zoology (2015)

BSc in Biochemistry & Zoology (2014) from the University of Johannesburg.

PROFESSIONAL AFFILIATIONS

South African Council for Natural Scientific Professions (SACNASP)
Professional Natural Scientist Reg no.: 133433

ACCREDITATION

South African Scoring System version 5 (SASS5)
Nepid Consultants | Mar 2020 - 2023

CERTIFICATION

First Aid - Level 1 Course
Medical Skill Training | Jul 2023 - 2026

WORK EXPERIENCE

Hunts Green Consulting	South-Africa
Senior Ecologist February 2024 - Present	
Enviroworks	South-Africa
Environmental Consultant June 2024 - January 2025	
Anchor Environmental Consultants	South-Africa
Environmental Control Officer May 2023 - May 2024	
Anchor Environmental Consultants	South-Africa
Ecologist & Environmental Consultant Jul 2022 - May 2024	
Digby Wells Environmental	South-Africa
Assistant Ecology & Atmospheric Consultant Apr 2021 - Jun 2022	
Digby Wells Environmental	South-Africa
Assistant Ecology & Atmospheric Consultant Apr 2021 - Jun 2022	
Digby Wells Environmental	South-Africa
Aquatics Intern Jun 2019 - Mar 2021	



HUNTS GREEN

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CURRICULUM VITAE**NDOU JULIA****ACCREDITATION**

*South African Scoring
System version 5 (SASS5)*

*Nepid Consultants / Mar
2020 - 2023*

PROFILE AND EXPERIENCE

Julia's training & experience has made her highly competent within a variety of disciplines, including environmental monitoring, impact assessments. Her tasks included marine, freshwater (aquatic & wetland), estuarine & terrestrial baseline, risk & impact assessments, environmental management plans & monitoring compliance, applications for prospecting, mining & other operational rights, conservation & monitoring of protected species & habitats. Moreover, she was also an Environmental Control Officer (ECO) for the Saldanha Bay sea-based Aquaculture Development Zone. In this role she ensured that environmental regulations & sustainability practices were implemented & adhered to throughout the project. She monitored & enforced compliance with local, regional, & national environmental regulations, permits, & licenses relevant to aquaculture operations. She conducted monthly site visits to ensure that the farm comes into compliance with operational guidelines set out in the Environmental Authorisation (EA) & the Environmental Management Programme (EMPr).

PROJECT HISTORY

Period	Country	Clients	Project, Tasks
Hunts Green Consulting			
2025	South Africa	ZN Geo Services (Pty) Ltd	Wetland Baseline and Risk Assessment Report for the Proposed Aggregate Mining Permit Application Located on Farm Gardinia 8486 in Newcastle Local Municipality, Kwazulu-Natal.
2025	South Africa	ZN Geo Services (Pty) Ltd	Wetland Baseline and Risk Assessment Report for the Proposed Coal Mining Permit Application Located on Farm Qamu 17486 in Msinga Local Municipality, Kwazulu-Natal.
2025	South Africa	ZN Geo Services (Pty) Ltd	Wetland Baseline and Risk Assessment Report for the Proposed Aggregates Mining Permit Application Located on Farm Northdown RE/1/4306 in Newcastle, Kwazulu-Natal.
2025	South Africa	ZN Geo Services (Pty) Ltd	Wetland Impact Assessment in support of a Mining Permit Application on Lower Oaklands 16728 (Portion 4) Located in Kwadukuza Local Municipality in the Kwazulu-Natal Province, Kwazulu-Natal Province.
2025	South Africa	Emanzini WULA Consultants	Wetland Rehabilitation Plan for the Wetland Rehabilitation Plan for the Vaalbank Langoed, Irrigation and Feedlots Water Use License Application near Newcastle, Kwazulu-Natal Province.
2025	South Africa	Emanzini WULA Consultants	Wetland Rehabilitation Plan for the Proposed Block G and P Mine Pits for Tripalex (Pty) Ltd.'s Water Use License Application on Portion 1 of the Farm Zoetmelksrivier 86, Utrecht, Kwazulu-Natal Province.
2025	South Africa	Emanzini WULA Consultants	Wetland Offset and Rehabilitation Plan for the Expansion of Navitrade Facility by Additional 25ha to Increase Coal Capacity on Portion 94 Of Erf No. 5333, within Umhlothuzane Municipality, Kwazulu-Natal



HUNTS GREEN

CURRICULUM VITAE**NDOU JULIA**

Period	Country	Clients	Project, Tasks
2025	South Africa	Emanzini WULA Consultants	Wetland Impact Assessment for the Proposed Expansion of Three Grindrod Terminal Bulk Material Facilities, Richards Bay Within Umhlathuze Local Municipality, Kwazulu-Natal Province.
2024	South Africa	Emanzini WULA Consultants	Wetland Impact Assessment and Rehabilitation Plan for a Water Use Licence Application on Portion 2 Of Farm La Belle Esperance No. 191, Located in Mkhondo Local Municipality, Mpumalanga Province.
Enviroworks			
2024	South Africa	Eskom Matla	Water Use Licence Application for the renewal and amendment of Matla power station water use licence in the Mpumalanga Province: Aquatic Biodiversity Impact Assessment, Section (c) and (i) Risk Assessment Matrix.
2024	South Africa	Moedi Consulting Engineers	Water Use Licence Application for the development of the Coligny wastewater treatment works and associated infrastructure, North West Province.
2024	South Africa	Moedi Consulting Engineers	Water Use Licence Application: S24G environmental rectification for the operation of facilities for the treatment of wastewater with a daily throughput of 3000 cubic meters, Itsoeng, North West Province.
2024	South Africa	Moedi Consulting Engineers	Water Use Licence Application: Rectification of the existing Itsekeng wastewater treatment plant (WWTP) discharge pipeline, North West Province.
2024	South Africa	Moedi Consulting Engineers	Water Use Licence Application for the proposed construction of an oxidation pond system and two gravity outfall sewer lines, Ipelegeng, Northwest Province.
2024	South Africa	Moedi Consulting Engineers	Water Use License Application for proposed expansion of a wastewater treatment plant on Portion 0 Of Erf 1171, within the Vaal-Harts Settlement A, Northern Cape Province.
2024	South Africa	Moedi Consulting Engineers	Water Use Licence Application: Lichtenburg wastewater treatment works on Portion 38 of Farm Elandsfontein NO. 34 and Portion 1 of farm Lichtenburg town and townlands NO. 27, Lichtenburg, North West Province.
2024	South Africa	Moedi Consulting Engineers	Water use licence application for the renewal and amendment of Matla Power Station in the Mpumalanga Province: Aquatic Biodiversity Impact Assessment, Section (c) and (i) DWS Risk Assessment Matrix .
2024	South Africa	Moedi Consulting Engineers	The development of the Coligny wastewater treatment works and associated infrastructure: Aquatic Biodiversity Theme Impact Assessment.
2024	South Africa	Moedi Consulting Engineers	S24G environmental rectification for the operation of facilities for the treatment of wastewater with a daily throughput of 3000 cubic meters, Itsoeng, North West Province: Section (c) and (i) DWS Risk Assessment Matrix and Aquatic Biodiversity Impact Assessment.
			Proposed construction of an oxidation pond system and



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CURRICULUM VITAE**NDOU JULIA**

Period	Country	Clients	Project, Tasks
			Assessment Matrix and Aquatic Biodiversity Compliance Statement.
2024	South Africa	Neil Lyners and Associates (on behalf of the City of Cape Town)	Environmental Management Programme: Proposed refurbishment and relocation of damaged electric cables near a bridge in Clovelly, Western Cape Province.
2024	South Africa	Neil Lyners and Associates (on behalf of the City of Cape Town)	Environmental Control Officer services for the relocation / replacement of street lighting on or near the remainder of erf 285, Gordons Bay, Western Cape.
2024	South Africa	Neil Lyners and Associates (on behalf of the City of Cape Town)	Environmental Control Officer services for the refurbishment and relocation of damaged electric cables near a bridge in Clovelly, Western Cape Province.
2024	South Africa	Mr. Johan Adam Farm: Eastbrook 183 Farm portion 45	The proposed development of a mountain bike track and associated infrastructure on plot 45, karatara region, within the garden route district municipality, Western Cape Province: Plant Species, Animal Species and Terrestrial Biodiversity Theme Compliance Statement.
2024	South Africa	Mr Jannie Nel Farm Doorndraai No. 459 Somerset East 5850	Section 21 (c) and (i) risk assessment, Aquatic Impact Assessment and General Authorisation for the proposed development of the Doorndraai Farm near Cookhouse, Eastern Cape Province.
2024	South Africa	REH Operations & Maintenance (REH), is a subsidiary of the Serengeti Energy Group	Aquatic Impact Assessment for the proposed maintenance management plan for the maintenance of three hydropower facilities, Bethlehem, Free State Province.
2024	South Africa	Voltalia	The proposed solar springs photovoltaic phase 4 near Bela-Bela in Limpopo Province: Plant Species Compliance Statement and Terrestrial Biodiversity Impact Assessment Report.
Anchor Environmental Consultants			
2024	South Africa	Department of Forestry, Fisheries and the Environment, WildOceans	Stakeholder Engagement Plan for the development of a management plan for the southeast Atlantic and southwest Indian Seamount Marine Protected Areas in South Africa.
2024	South Africa	Port Nolloth Sea Farms Ranching	Environmental Authorization Amendment for abalone holding and processing facility for Port Nolloth sea Farms in Kleinsee, Northern Cape
2024	South Africa	Zutari	Aquatic Ecology Assessment for the proposed Rooipoort renewable energy project, Klerkdrorp, Northwest Province
2023-2024	South Africa	De Beers Marine South Africa (Pty) Ltd	External Environmental Compliance Audit for Prospecting Right NC12189 PR in South African Sea Area 6C.
		ERM -	Marine/Estuarine Specialist study and Delft-3D



HUNTS GREEN

CURRICULUM VITAE

NDOU JULIA



Period	Country	Clients	Project, Tasks
		Management for DP World	application for proposed expansion of the Maputo container terminal in the Port of Maputo, Mozambique.
2023-2024	South Africa	Marine Living Resources Fund, Department of Environment, Forestry and Fisheries	Independent Environmental Control Officer (ECO) for the Saldanha Bay sea-based Aquaculture Development Zone.
2023	South Africa	Zutari	Marine Specialist for the EIA process for the Sea Water Desalination Project at the Cape Town Port Industrial Park (PIP).
2023	South Africa	TNPA/MPA MOT/Exigent	Environmental Assessment for the Port of Richards Bay Masterplan
2023	South Africa	African Tuna	Feasibility study for the commercial harvesting of periwinkles and limpets on the west coast of South Africa.
2023	South Africa	Guillaume Nel Environmental Consultants	Estuarine Specialist study for the proposed upgrading of TR77/1 (R27), Velddrif.
2023	Angola	SHELTER (on behalf of Eni Angola)	Preparation of a Biodiversity Action Plan (BAP) as part of the Angola Northern Gas Complex Onshore Plant Project ESHIA and ESHMP.
2022-2023	South Africa	Matzikama Kaolin	Environmental Impact Assessment and application for prospecting rights: Prospecting of kaolin in the Western Cape - Assisting the Environmental Assessment Practitioner; - Compiling Scoping and Environmental Impact Assessment (S&EIA) Report; - Compiling Environmental Management Programme (EMPr); and - Conducting several Public Participation Processes.
2022-2023	South Africa	Xwena Kaolin	Environmental Impact Assessment and application for prospecting rights: Prospecting of kaolin and silica in the Western Cape - Assisting the Environmental Assessment Practitioner; - Compiling Scoping and Environmental Impact Assessment (S&EIA) Report; - Compiling Environmental Management Programme (EMPr); and - Conducting several Public Participation Processes.
2022-2023	South Africa	Drylands Farms	Basic Assessment Process for a proposed agricultural development on a mine in the Northern Cape of South Africa - Assisting the Environmental Assessment Practitioner; - Compiling Scoping and Environmental Impact Assessment (S&EIA) Report; - Compiling Environmental Management Programme (EMPr); and



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CURRICULUM VITAE

NDOU JULIA



Period	Country	Clients	Project, Tasks
2022	South Africa	Johan Neethling Environmental Services cc	Estuarine Assessment for the mosaic lagoon lodge farm 1012, Hermanus pre-compliance notice ground truthing.
2022	South Africa	Trans Atlantic Diamonds	Basic Assessment Process and application for prospecting rights in an offshore sea concession 10B in the Northern Cape - Assisting the Environmental Assessment Practitioner; - Compiling Scoping and Environmental Impact Assessment (S&EIA) Report; - Compiling Environmental Management Programme (EMPr); and - Conducting several Public Participation Processes.
2022	South Africa	Trans Atlantic Diamonds	Basic Assessment Process and application for prospecting rights in an offshore sea concession 7C in the Northern Cape - Assisting the Environmental Assessment Practitioner; - Compiling Scoping and Environmental Impact Assessment (S&EIA) Report; - Compiling Environmental Management Programme (EMPr); and - Conducting several Public Participation Processes.
2022	South Africa	Lawrence Esterhuysen	A Freshwater Specialist assessment for the proposed renovations at no. 5 quarry lane, Simon's Town, Cape Town, Western Cape.
2022	South Africa	Nemai Consulting	Wetland Specialist assessment of the Belcon Terminal site, Bellville, Western Cape.
Digby Wells Environmental			
2021	South Africa	Sibanye Stillwater	Sibanye Stillwater Aquatic Biomonitoring, Northwest Province.
2021	South Africa	Exxaro Resources	Matla Colliery Terrestrial Ecology Assessment, Mpumalanga Province.
2021	South Africa	Copper Sunset Sand (Pty) Ltd	Copper Sunset Mining Right Extension: Fauna and Flora Assessment, Mpumalanga Province.
2021	South Africa	Universal Coal Plc	New Clydesdale Fauna and Flora Assessment Mpumalanga Province.
2021	Mali	Cora Gold - West African Gold	Cora Gold's Sanankoro ESIA: Fauna and Flora Assessment.
2020-2021	South Africa	Digby Wells Environmental	Project Assistance and Administration: BBBEE audits Fulfilling the primary duties of an administrator
2020	South Africa	Eskom Holdings SOC Ltd	Eskom Kilbarchen Colliery Aquatic Baseline Assessment, Mpumalanga Province.
2020	South Africa	Blair Atholl Golf & Equestrian Estate	Blair Atholl DWS Queries: Aquatic Biodiversity Assessment, Gauteng Province.
2020	Mali	Oklo Resources Limited	Oklo Resources ESIA: Fauna and Flora Assessment.
2020	South Africa	Anglo American plc	Anglo American Greenside Colliery Wetland and Impact Assessment, Mpumalanga Province.



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CURRICULUM VITAE**NDOU JULIA**

Period	Country	Clients	Project, Tasks
2019-2021	South Africa	Sasol Limited	Sasol Mooikraal Colliery Wastewater And Aquatic Biomonitoring, Gauteng Province.
2019-2021	South Africa	Exxaro and Thungela Resources Limited	Mafube Coal Mine Aquatic Biomonitoring, Mpumalanga Province.
2019-2021	South Africa	Sasol Limited	Sasol ECO Ash Backfilling Aquatic Biomonitoring, Free State Province.
2019-2021	South Africa	Exxaro Resources	Matla Colliery Aquatic And Wetland Biomonitoring, Mpumalanga Province.
2019-2020	South Africa	Seriti Coal	New Largo Coal Mine Aquatic Biomonitoring, Mpumalanga Province.
2019-2020	South Africa	Dagsoom Coal Mining (Pty) Ltd	Dagsoom Twyfelaar Coal Mine Aquatic Biodiversity And Impact Assessment, Mpumalanga Province
2019-2020	South Africa	Ivanplats (Pty) Ltd.	Ivanplats Platinum Mining Operation Aquatic Biomonitoring, Mpumalanga Province.
2019-2020	South Africa	Universal Coal Plc	Universal Coal Development 's Eerstelingsfontein Colliery Expansion Wetland Assessment, Mpumalanga Province.
2019-2020	South Africa	Sasol Limited	Environmental Audit for Sasol Retail Filling Stations - Sasol Limited's South African Energy Business across South African Provinces Compliance Auditing • Fulfilling the primary duties of a compliance auditor
2019	South Africa	Sasol Limited	Sasol Irenedale Wetland Assessment, Mpumalanga Province.
2019	South Africa	Mbuyelo Group (Pty) Ltd	Mbuyelo Group's Weltevreden Mine Wetland Assessment, Mpumalanga Province.

Client: Vahlengwe Mining Advisory and Consulting (Pty) Ltd

Report Title: WETLAND IMPACT ASSESSMENT IN SUPPORT OF THE PROSPECTING RIGHT

APPLICATION OF COAL ON LOT 289 EMPANGENI 13389 GU AND LOT 285



HUNTS GREEN

Document Number: HG01-00-GEN-2026.01.27-r1-REP-VAH118

15 Appendix C: CV of Reviewer

CURRICULUM VITAE:

KHUME MTSHWENI



PERSONAL DETAILS

Name : Khume Mtshweni
Profession : Associate Freshwater Specialist
Year of Experience : 7+

SKILLS AND COMPETENCIES

- Surface and Ground water biomonitoring
- Environmental Management Programmes (EMP)
- Wetland delineations and ecological assessments
- Rehabilitation Plans and Monitoring
- Faunal and Floral assessments
- The use of macroinvertebrates and sediment to determine water quality
- Aquatic Ecological Assessments
- Wetland ecology.
- Biological Carbon Sequestration.
- Project management.

QUALIFICATIONS

*MSc (University of Johannesburg)
– Aquatic Health- 2020*

*BSc Honours (University of
Johannesburg) – Zoology - 2017*

*BSc Environmental Sciences -
2016*

*Certificate of Competence:
Wetland introduction and
Delineation course - 2021*

*Certificate of Competence:
Wetland Legislation and Rehab
Course - 2022*

PROFESSIONAL AFFILIATIONS

Ecological Sciences

Pr Sci Nat (138592)

WORK EXPERIENCE

Hunts Green Consultants (PTY) Ltd **South Africa**
Associate Freshwater Specialist | October 2024 – Current

The Biodiversity Company **South-Africa**
Freshwater & Terrestrial Ecologist | April 2023 – Current

Milnex CC **South-Africa**
Wetland & Terrestrial Ecologist / March 2021 – March 2023

Golder Associates **South-Africa**
Graduate intern (Biodiversity)/ 2017 - 2020

PROFILE AND EXPERIENCE

Khume Mtshweni has extensive working experience throughout South Africa. He has specialist experience in prospecting, mining, agriculture, the private sector, and renewable energy. He is well-versed in faunal and floral permit applications as well as public participation processes. His specialist expertise includes both freshwater and terrestrial ecology.

Client: Vahlengwe Mining Advisory and Consulting (Pty) Ltd

Report Title: WETLAND IMPACT ASSESSMENT IN SUPPORT OF THE PROSPECTING RIGHT

APPLICATION OF COAL ON LOT 289 EMPANGENI 13389 GU AND LOT 285



Document Number: HG01-00-GEN-2026.01.27-r1-REP-VAH118

**Palaeontological Impact Assessment FOR THE
PROSPECTING RIGHT APPLICATION OF COAL
ON LOT 289 EMPANGENI 13389 GU AND LOT
285 EMPANGENI 13400 GU, SITUATED IN KING
CETSHWAYO DISTRICT MUNICIPALITY, KWA-
ZULU NATAL PROVINCE.**

KZN 30/5/1/1/2/ 12129 PR

Desktop Study (Phase 1)

Subcontracted by

Vahlengwe Mining Advisory and Consulting (Pty) Ltd

March 2026

Prof Marion Bamford

Palaeobotanist

P Bag 652, WITS 2050

Johannesburg, South Africa

1. Executive Summary

A Palaeontological Impact Assessment was requested for the prospecting right application for chrome, manganese, coal and gold prospecting activities in respect of coal on lot 289 Empangeni 13389 GU, lot 285 Empangeni 13400 GU, situated in King Cetshwayo district, Kwa-Zulu Natal Province.

BID Molobedu Makoweni KZN 30/5/1/1/2/ 12129 PR

Prospecting right application. Environmental authorisation for the prospecting right application of coal on
Lot 289 Empangeni 13389 GU
and Lot 285 Empangeni 13400 GU,

To comply with the regulations of the South African Heritage Resources Agency (SAHRA) in terms of Section 38(8) of the National Heritage Resources Act, 1999 (Act No. 25 of 1999) (NHRA), a desktop Palaeontological Impact Assessment (PIA) was completed for the proposed development.

The proposed sites lie on the very highly sensitive of the Emakwezini Formation (Ecca Group, Karoo Supergroup) that preserves coal seams and fossil plants of the *Glossopteris* flora. It should be noted that fossils are abundant in this formation. Therefore, a Fossil Chance Find Protocol should be added to the EMPr. Based on this information it is recommended that a site visit palaeontological impact assessment is required BEFORE any mining operations commence. If fossils are found by the contractor, environmental officer or other designated responsible person once prospecting excavations and drilling activities have commenced. Since the impact will be **moderate to high**, as far as the palaeontology is concerned, AMAFA must be notified as soon as any fossils are found.

ASPECT	SCREENING TOOL SENSITIVITY	VERIFIED SENSITIVITY	OUTCOME STATEMENT/ PLAN OF STUDY	RELEVANT SECTION MOTIVATING VERIFICATION
Palaeontology	Very High	HIGH	Palaeontological desktop Impact Assessment	Section 7.2. SAHRA Requirements

2. Declaration of independence and summary of expertise.

a. Declaration

This report has been compiled by Professor Marion Bamford, of the University of the Witwatersrand, sub-contracted by Tsimba Archaeological Footprints, Johannesburg, South Africa. The views expressed in this report are entirely those of the author and no other interest was displayed during the decision-making process for the Project.

Specialist: Prof Marion Bamford

Signature: 

b. Expertise

The Palaeontologist Consultant: Prof Marion Bamford

Qualifications: PhD (Wits Univ, 1990); FRSSAf, mASSAf, PSSA

Experience: 36 years research and lecturing in Palaeontology; over 28 years PIA studies and over 450 projects completed.

c. Specialist declaration of independence and statement of objectivity for the assessment.

Declaration of Independence

I, Marion Bamford, declare that –

General declaration:

- I act as the independent palaeontology practitioner 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 palaeontological impact assessments, 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 will take into account, to the extent possible, the matters listed in section 38 of the NHRA when preparing the application and any report relating to the application,
- 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,
- I will ensure that information containing all relevant facts in respect of the application is distributed or made available to interested and affected parties

and the public and that participation by interested and affected parties is facilitated in such a manner that all interested and affected parties will be provided with a reasonable opportunity to participate and to provide comments on documents that are produced to support the application,

- I will provide the competent authority with access to all information at my disposal regarding the application, whether such information is favourable to the applicant or not
- All the particulars furnished by me in this form are true and correct,
- I will perform all other obligations as expected from a heritage practitioner in terms of the Act and the constitutions of my affiliated professional bodies; and
- I realise that a false declaration is an offence in terms of regulation 71 of the Regulations and is punishable in terms of section 24F of the NEMA.

Disclosure of Vested Interest

- I do not have and will not have any vested interest (either business, financial, personal or other) in the proposed activity proceeding other than remuneration for work performed in terms of the Regulations.

d. Summary of the specialist's expertise

I, Marion Bamford, am a professional Palaeontologist with a PhD in Palaeontology (Wits University, 1990). I have more than 36 years of experience in palaeontological research and have published over 200 papers in peer-reviewed journals and published more than 14 scholarly book chapters. I review manuscripts for international and local journals and also review funding proposals for international funding bodies. Currently I am the Director of the Evolutionary Studies Institute, the only palaeontological institute in Southern Africa.

I have completed more than 500 palaeontological impact assessments (desktop and site visit studies) in the last 29 years for a variety of projects (solar energy projects, wind energy projects, powerlines, roads, infrastructure, housing and retail projects and from all over South Africa. I have been subcontracted by over 30 different companies. From my own projects and training provided by me and other staff in the ESI for Palaeontological Impact Assessments, I am familiar with the legislation.

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3. Project Background

Vahlengwe Mining Advisory and Consulting as an Environmental Assessment Practitioner (EAP) will conduct Environmental Authorization process for the prospecting right application for chrome, manganese, coal and gold prospecting activities in respect of coal on lot 289 Empangeni 13389 GU, lot 285 Empangeni 13400 GU, situated in King Cetshwayo district, Kwa-Zulu Natal Province.

BID Molobedu Makoweni, KZN 30/5/1/1/2/ 12129 PR

Prospecting right application. Environmental authorisation for the prospecting right application of coal on

- Lot 289 Empangeni 13389 GU, and
- Lot 285 Empangeni 13400 GU

The proposed project is situated 19 km North of Empangeni and 21 km West of KwaMbonambi town and northwest of Ndondondwane, accessible via the R34 access road (Figures 1, 3).

The project requires environmental authorization in terms of the National Environmental Management Act (NEMA, 1998) and a prospecting right under Section 16 of the Mineral and Petroleum Resources Development Act (MPRDA, 2002). Several other legislative frameworks apply, including the National Water Act, the National Environmental Management: Biodiversity Act, and the National Environmental Management: Air Quality Act. The project is designed to operate within the framework of South Africa's environmental legislation, including the National Environmental Management Act (NEMA). It is subject to a Basic Assessment (BA) process as prescribed by the Environmental Impact Assessment (EIA) Regulations.

Thus, prospecting activities will be conducted using mechanised equipment, primarily drill rigs, to ensure efficient and controlled resource recovery.

The proposed mining operation is anticipated to yield both beneficial and adverse environmental effects. On the positive side, it is expected to generate employment opportunities, stimulate local economic growth, and meet the rising demand for construction materials essential to infrastructure development. Thus, the report investigates both positive and negative potential effects on environmental and social challenges. These include risks such as contaminated water penetrating through soil layers into waterbodies, soil quality, loss of biodiversity, deterioration of air quality due to dust and diesel emissions, and noise pollution that may impact surrounding communities.

Specialist studies have been proposed, covering areas such as agriculture, terrestrial, geohydrology, palaeontology, and wetlands. Effective mitigation strategies encompass significant topsoil and vegetation conservation, a phased prospecting approach with continuous and concurrent rehabilitation, dust suppression measures, stormwater management, maintaining buffer zones near water bodies and residential areas, as well as ongoing ecological and social monitoring.

Following the cessation of prospecting activities, the site will be rehabilitated concurrently with the goal of restoring it for grazing land, residential, and sustainable agricultural use. Key considerations include land use compatibility, dust and noise management, water resource protection, and rehabilitation planning. The project area is located in proximity to residential and business areas and contains coal mineral deposits.

Through this assessment, Molobedu will demonstrate its commitment to responsible mining practices and environmental stewardship while contributing to the economic development of the region. However, Vahlengwe Mining Advisory and Consulting (Pty) Ltd, hereafter “Vahlengwe”, has been appointed by Molobedu Makoweni (Pty) Ltd as the independent Environmental Assessment Practitioner (EAP) to facilitate the Environmental Authorisation for the prospecting right application for exploring coal value.

Public participation is a critical component of the project process, ensuring that Interested and Affected Parties (I&APs), including residents of Bukhanana who are actively engaged, and their input is meaningfully incorporated into the planning and decision-making of the report.

A Palaeontological Impact Assessment was requested for the prospecting right application for chrome, manganese, coal and gold prospecting activities in respect of coal on lot 289 Empangeni 13389 GU, lot 285 Empangeni 13400 GU, situated in King Cetshwayo district, Kwa-Zulu Natal Province. To comply with the regulations of the South African Heritage Resources Agency (SAHRA) in terms of Section 38(8) of the National Heritage Resources Act, 1999 (Act No. 25 of 1999) (NHRA), a desktop Palaeontological Impact Assessment (PIA) was completed for the proposed development and is reported herein. The minimum requirements for reporting are listed in Table 1.

Table 1: National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA) and Environmental Impact Assessment (EIA) Regulations, 2014 (as amended) - Requirements for Specialist Reports (Appendix 6). Includes the requirements from GNR Appendix 6 of GN 326 EIA Regulation 2017.

	A specialist report prepared in terms of the Environmental Impact Regulations of 2017 must contain:	Relevant section in report
ai	Details of the specialist who prepared the report,	Section 2
aii	The expertise of that person to compile a specialist report including a curriculum vitae	Section 2
b	A declaration that the person is independent in a form as may be specified by the competent authority	Section 2
c	An indication of the scope of, and the purpose for which, the report was prepared	Section 3
ci	An indication of the quality and age of the base data used for the specialist report: SAHRIS palaeosensitivity map accessed – date of this report	Yes
cii	A description of existing impacts on the site, cumulative impacts of the proposed development and levels of acceptable change	Section 6
d	The date and season of the site investigation and the relevance of the season to the outcome of the assessment	N/A
e	A description of the methodology adopted in preparing the report or carrying out the specialised process	Section 4
f	The specific identified sensitivity of the site related to the activity and its associated structures and infrastructure	Section 6
g	An identification of any areas to be avoided, including buffers	N/A
h	A map superimposing the activity including the associated structures and infrastructure on the environmental sensitivities of the site including areas to be avoided, including buffers;	N/A
i	A description of any assumptions made and any uncertainties or gaps in knowledge;	Section 7
j	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
k	Any mitigation measures for inclusion in the EMPr	Section 10, Appendix A
l	Any conditions for inclusion in the environmental authorisation	N/A
m	Any monitoring requirements for inclusion in the EMPr or environmental authorisation	Section 10, Appendix A
ni	A reasoned opinion as to whether the proposed activity or portions thereof should be authorised	Section 8

	A specialist report prepared in terms of the Environmental Impact Regulations of 2017 must contain:	Relevant section in report
nii	If the opinion is that the proposed activity or portions thereof should be authorised, any avoidance, management and mitigation measures that should be included in the EMPr, and where applicable, the closure plan	Sections 8, 10
o	A description of any consultation process that was undertaken during the course of carrying out the study	N/A
p	A summary and copies of any comments that were received during any consultation process	N/A
q	Any other information requested by the competent authority.	N/A
2	Where a government notice gazetted by the Minister provides for any protocol or minimum information requirement to be applied to a specialist report, the requirements as indicated in such notice will apply.	N/A

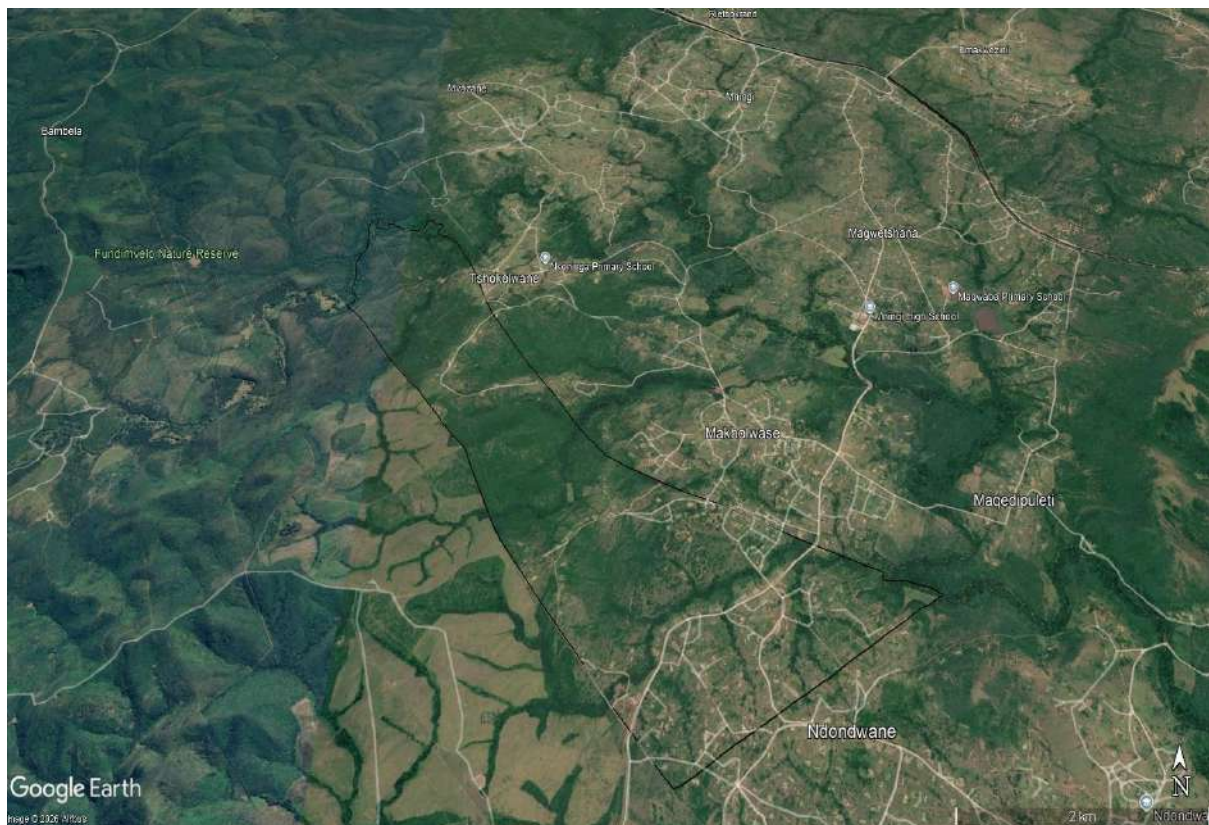


Figure 1:Google Earth Map of the prospecting right area on portion of land west of Empangeni with the boundary shown by the red outline. (12129PR).

4. Methods and Terms of Reference

The Terms of Reference (ToR) for this study were to undertake a PIA and provide feasible management measures to comply with the requirements of SAHRA.

The methods employed to address the ToR included:

1. Consultation of geological maps, literature, palaeontological databases, published and unpublished records to determine the likelihood of fossils occurring in the affected areas. Sources include records housed at the Evolutionary Studies Institute at the University of the Witwatersrand and SAHRA databases; eg <https://sahris.sahra.org.za/map/palaeo>
2. Where necessary, site visits by a qualified palaeontologist to locate any fossils and assess their importance (*not applicable to this assessment*);
3. Where appropriate, collection of unique or rare fossils with the necessary permits for storage and curation at an appropriate facility (*not applicable to this assessment*); and
4. Determination of fossils' representativity or scientific importance to decide if the fossils can be destroyed or a representative sample collected (*not applicable to this assessment*).

5. Geology and Palaeontology

i. Project location and geological context

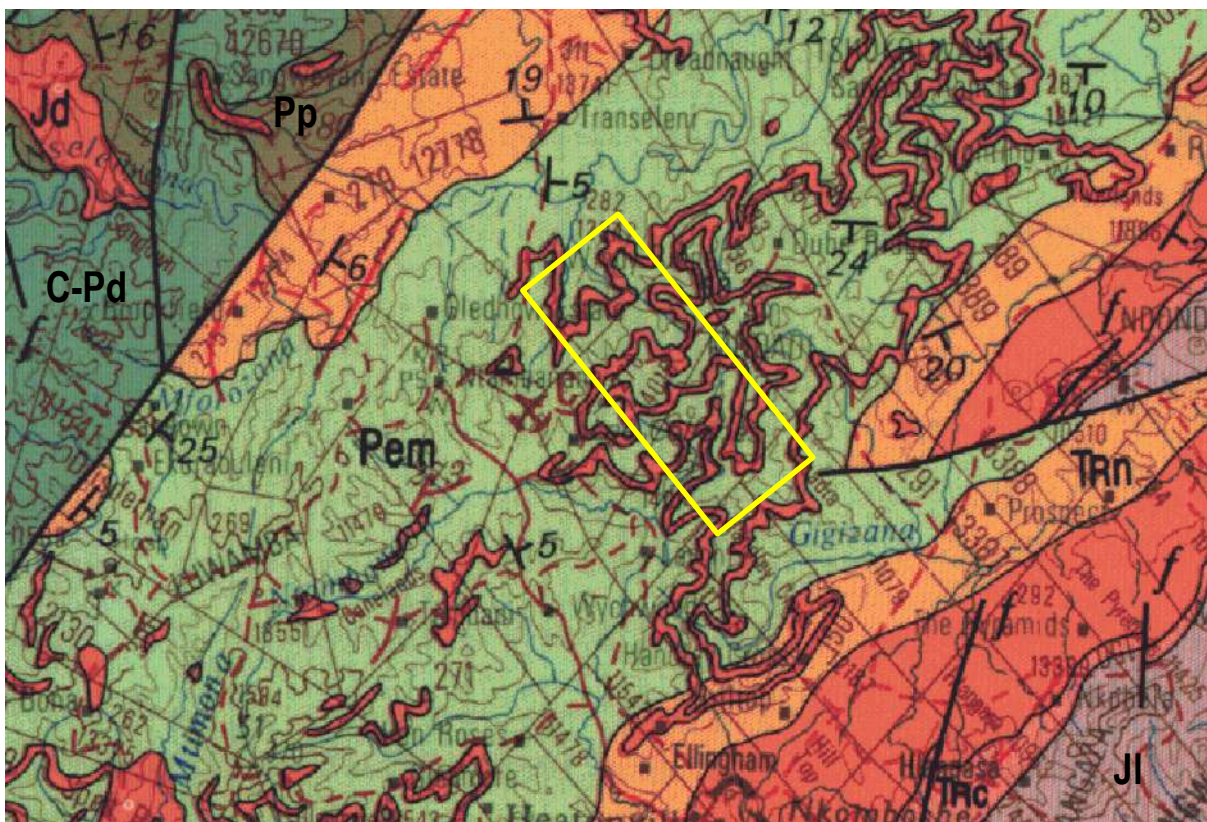


Figure 2: Geological map of the area around the prospecting area near Empangeni with the proposed project indicated within the yellow rectangle. Abbreviations of the rock types are explained in Table 2. Map enlarged from the Geological Survey 1: 250 000 map 2830.

Table 2: Explanation of symbols for the geological map and approximate ages (Cornell et al., 2006; Johnson et al., 2006). SG = Supergroup; Fm = Formation; Ma = million years; grey shading = formations impacted by the project.

Symbol	Group/Formation	Lithology	Approximate Age
Q	Quaternary	Alluvium, sand, calcrete	Quaternary ca 1.0 Ma to Present
Jd	Jurassic dykes	Dolerite dykes, intrusive	Jurassic, Ca 183 Ma
Jl	Letaba Group (equivalent to the Drakensberg Group)	Nephelinite; picritic lava, basalt	Early Jurassic Ca 185-175 Ma
Trc	Clarens Fm, Stormberg Group, Karoo SG	Cream, reddish aeolian sands, sandstone	Early Jurassic Ca 191-187 Ma
Try	Nyoka Fm, (Elliot Fm equivalent) Stormberg Group, Karoo SG	Purple, brownish-red and grey mudstone, sandstone	Late Triassic and Early Jurassic, ca 219 – 191 Ma
Trn	Ntabene Fm, (Verkykerskop or Molteno Fm, equivalent) ?Beaufort Group, Karoo SG	Gritty sandstone, grey mudstone, shale, coal	Early to Middle Triassic,
Pem	Emakwezini Fm, Ecca Group, Karoo SG	Shale, mudstone, coal, sandstone	Middle Permian ca 266 – 260 Ma
Pp	Pietermaritzburg Fm, Ecca Group, Karoo SG	Shale, siltstone, mudstone	Middle Permian ca 269 – 266 Ma
C-Pd	Mbizane Fm, Dwyka Group, Karoo SG	Tillites, diamictites, sandstone, mudstone, shale	Early Permian, ca 298 - 290 Ma

The project lies in the northeastern part of the Main Karoo Basin where the Palaeozoic sediments unconformably overlie the much older Natal sector of the Namaqua-Natal Metamorphic Sequence (Figure 4).

In the eastern-most part of South Africa, the Karoo Supergroup outcrops occur in a relatively narrow, monoclinical belt that dips to the east or southeast (Johnson et al., 2006). They extend from the southwest of Durban north-eastwards to north of Emapgeni and then farther northwards. There is a narrow wedge of Karoo rocks along the western side of the Lebombo and Ubombo mountain ranges

The Dwyka Group, Pietermaritzburg and Vryheid Formations in the east are similar to the Main Karoo Basin equivalent rocks but the Volksrust Formation and younger strata have been eroded away south of Swaziland (northern KwaZulu Natal). The sediments in this area have been mapped with different names.

During the Carboniferous Period South Africa was part of the huge continental landmass known as Gondwanaland and it was positioned over the South Pole. As a result, there were several ice sheets that formed and melted, and covered most of South Africa (Visser, 1986, 1989; Isbell et al., 2012). Gradual melting of the ice as the continental mass moved northwards and the earth warmed, formed fine-grained sediments in the large inland sea. These are the oldest rocks in the system and are exposed around the outer part of the ancient Karoo Basin, and are known as the Dwyka Group. They comprise tillites, diamictites, mudstones, siltstones and sandstones that were deposited

as the basin filled. This group has been divided into two formations with Elandsvlei Formation occurring throughout the basin and the upper Mbizane Formation occurring only in the Free State and KwaZulu Natal (Johnson et al., 2006).

Overlying the basal Dwyka Group glaciogene rocks are rocks of the Ecca Group that are Early Permian in age. In this eastern part of the Karoo they are the basal Pietermaritzburg Formation that is composed of dark grey to black fine-grained shales that were deposited in deep water. The overlying Vryheid Formation is composed of shales, mudstones, fine-grained sandstones and coal seams. Since the Volksrust Formation has largely been eroded in this area, the next stratum is the **Emakwezini** Formation that is equivalent to the Adelaide Subgroup of the Beaufort Group. It has alternating blue-grey, green-grey and black mudrocks and subordinate fine- to coarse-grained feldspathic sandstones (Johnson et al., 2006). Ranging from about 700m thickness east of Vryheid to about 380m thickness west of Empangeni, the Emakwezini Formation has up to eleven coal seams that are concentrated towards the middle of the formation.

The overlying **Ntabene** Formation (equivalent to either the Verkykerskop or Molteno Formations) is made up of medium- to coarse-grained, cross-bedded sandstones and subordinate grey to green shales. The sedimentary environment has been interpreted as a braided river system, and was erosive in some areas.

Comprising red or purple mudstone with calcareous concretions, and blue-grey to greenish siltstones and sandstones, the overlying **Nyoka Formation** is probably equivalent to the Elliot Formation of the Stormberg Group. In this region the Clarens Formation is very similar to the Main Karoo Basin outcrops of the same name. It is composed of light-coloured, fine- to very fine-grained sandstones that are structureless so probably of aeolian origin.

Capping the Karoo Supergroup sediments are the **Lebombo Group** rocks, probably the same age as the Drakensberg Group. The lower thin Mashikiri Formation is composed of nephelinite lavas while the overlying massive Letaba Formation is composed of a sequence of picritic (olivine-rich) lavas.

Large exposures of Jurassic dolerite dykes occur throughout the area. These intruded through the Karoo sediments around 183 million years ago at about the same time as the Drakensberg basaltic eruption.

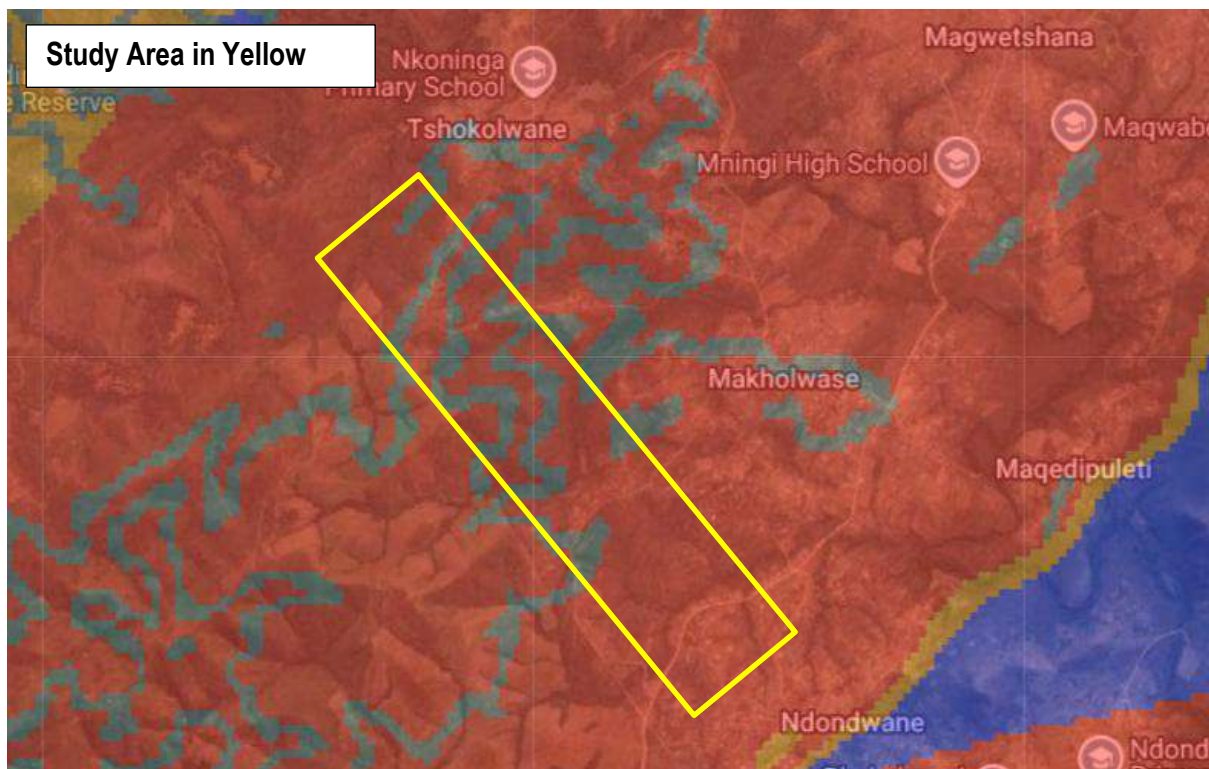
ii. Palaeontological context

The palaeontological sensitivity of the area under consideration is presented in Figure 4. The site for prospecting is in the very highly sensitive Emakwezini Formation (red) and the non-fossiliferous Jurassic dolerite (grey).

The **Emakwezini Formation** lies directly on the Pietermaritzburg Formation in the central and eastern part. The lithofacies show a number of upward-coarsening cycles, some very thick, and they are essentially deltaic in origin. There are also delta-front deposits, evidence of delta switching, and fluvial deposits with associated meandering

ivers, braided streams, back swamps or interfluvies and abandoned channels (Cadle et al., 1993; Cairncross, 1990; 2001; Johnson et al., 2006; Bordy and Prevec, 2008). Coal seams originated where peat swamps developed on broad abandoned alluvial plains, and less commonly in the backswamps or interfluvies. Concentrated in the centre of the Emakwezini are up to eleven coal seams (Johnson et al., 2006).

Fossil plants of the *Glossopteris* flora occur in the Emakwezini Formation. This flora includes *Glossopteris* leaves, seeds, fructifications, roots and wood, as well other groups such as the lycopods, sphenophytes, ferns, cordaitaleans and early gymnosperms. Some of the taxa are considered as diagnostic of the Late Permian, for example, *Schizoneura gondwanensis*, *Phyllothea australis*, *Dictyopteridium flabellatum*, *Rigbya arberioides*, *Lidgettonia* spp., *Trizygia speciosa*). However Early Permian glossopterid forms are present such as the fructification *Ottokaria* sp. cf. *huriadica*, so the precise age is unknown. Insects and trace fossils have also been found from the Somkele area (Bordy and Prevec, 2015).



Colour	Sensitivity	Required Action
RED	VERY HIGH	field assessment and protocol for finds is required
ORANGE/ YELLOW	HIGH	desktop study is required and based on the outcome of the desktop study, a field assessment is likely
GREEN	MODERATE	desktop study is required
BLUE	LOW	no palaeontological studies are required however a protocol for finds is required
GREY	INSIGNIFICANT/ZERO	no palaeontological studies are required
WHITE/CLEAR	UNKNOWN	these areas will require a minimum of a desktop study. As more information comes to light, SAHRA will continue to populate the map.

Figure 3: SAHRIS palaeosensitivity maps for the site for the prospecting right area near Empangeni shown within the yellow rectangle. See colour coding between the two maps.

From the SAHRIS maps above the areas are indicated as very highly sensitive (red) so a visit must be conducted BEFORE any mining activities commence. For the prospecting activities, the Fossil Chance Find Protocol (Section 10) must be followed and AMAFA must be notified when any fossils are found.

6. Impact assessment

An assessment of the potential impacts to possible palaeontological resources considers the criteria encapsulated in Table 3:

Table 3a: Criteria for assessing impacts

PART A: DEFINITION AND CRITERIA		
Criteria for ranking of the SEVERITY/NATURE of environmental impacts	H	Substantial deterioration (death, illness or injury). Recommended level will often be violated. Vigorous community action.
	M	Moderate/ measurable deterioration (discomfort). Recommended level will occasionally be violated. Widespread complaints.
	L	Minor deterioration (nuisance or minor deterioration). Change not measurable/ will remain in the current range. Recommended level will never be violated. Sporadic complaints.
	L+	Minor improvement. Change not measurable/ will remain in the current range. Recommended level will never be violated. Sporadic complaints.
	M+	Moderate improvement. Will be within or better than the recommended level. No observed reaction.
	H+	Substantial improvement. Will be within or better than the recommended level. Favourable publicity.
Criteria for ranking the DURATION of impacts	L	Quickly reversible. Less than the project life. Short term
	M	Reversible over time. Life of the project. Medium term
	H	Permanent. Beyond closure. Long term.
Criteria for ranking the SPATIAL SCALE of impacts	L	Localised - Within the site boundary.
	M	Fairly widespread – Beyond the site boundary. Local
	H	Widespread – Far beyond site boundary. Regional/ national
PROBABILITY (of exposure to impacts)	H	Definite/ Continuous
	M	Possible/ frequent
	L	Unlikely/ seldom

Table 3b: Impact Assessment

PART B: Assessment		
SEVERITY/NATURE	H	-
	M	-
	L	Soils do not preserve fossils; so far there are no records from the Emakwezini Fm of plant or animal fossils in this region so it is very unlikely that fossils occur on the site. The impact would be negligible
	L+	-
	M+	-
	H+	-
DURATION	L	-
	M	-
	H	Where manifest, the impact will be permanent.
SPATIAL SCALE	L	Since the only possible fossils within the area would be fossil plants in the shales and mudstones associated with the coal seams, the spatial scale will be localised within the site boundary.
	M	-
	H	-
PROBABILITY	H	It is very likely that fossil plants of the <i>Glossopteris</i> flora occur in the project footprint and will be destroyed by mining activities. For the prospecting activities, a Fossil Chance Find Protocol should be added to the eventual EMPr.
	M	-
	L	-

Based on the nature of the project, surface activities may impact upon the fossil heritage if preserved in the development footprint. The geological structures suggest that the rocks are the correct age and type to contain fossil plants. Furthermore, the material to be targeted is Coal and the fossil plants will be associated with the carbonaceous shales associated with coal seams. Since there is a high chance that fossils from the Emakwezini Formation may be disturbed a Fossil Chance Find Protocol has been added to this report. Taking account of the defined criteria, the potential impact to fossil heritage resources is HIGH.

7. Assumptions and uncertainties

Based on the geology of the area and the palaeontological record as we know it, it can be assumed that the formation and layout of the dolomites, sandstones, shales and sands are typical for the country and only some might contain fossil plant, insect, invertebrate and vertebrate material. The Emakwezini Formation is known to have abundant fossil plant material. The sands of the Quaternary period would not preserve fossils.

8. Recommendation

Based on experience and the knowledge of previously recorded fossils from the area, it is extremely likely that fossils will be preserved in the mudstones, siltstones or shales of the Emmakwezini Formation (Beaufort Group, Karoo Supergroup) so a Fossil Chance Find Protocol should be added to the EMPr. If fossils are found by the environmental officer, or other responsible person once excavations, trenching and drilling activities for prospecting have commenced then AMAFA must be notified so that the fossils can be rescued and a palaeontologist called to assess and collect a representative sample. The impact on the palaeontological heritage would be HIGH to MODERATE, as far as the palaeontology is concerned, so the project should be carefully monitored by AMAFA. A site visit must be conducted by a palaeontologist BEFORE any mining commences.

ASPECT	SCREENING TOOL SENSITIVITY	VERIFIED SENSITIVITY	OUTCOME STATEMENT/ PLAN OF STUDY	RELEVANT SECTION MOTIVATING VERIFICATION
Palaeontology	Very High	HIGH	Palaeontological Impact Assessment	Section 7.2. SAHRA Requirements

9. References

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10. Fossil Chance Find Protocol

Monitoring Programme for Palaeontology – to commence once the excavations / drilling / mining activities begin.

1. The following procedure is only required if fossils are seen on the surface and when drilling/excavations/mining commence.
2. When excavations begin the rocks and discard must be given a cursory inspection by the environmental officer or designated person. Any fossiliferous material (plants, insects, bone or trace fossils) should be put aside in a suitably protected place. This way the project activities will not be interrupted.
3. Photographs of similar fossils must be provided to the developer to assist in recognizing the fossil plants, vertebrates, invertebrates or trace fossils in the shales and mudstones (for example see Figures 6-7). This information will be built into the EMP's training and awareness plan and procedures.
4. Photographs of the putative fossils can be sent to the palaeontologist for a preliminary assessment.
5. If there is any possible fossil material found by the developer/environmental officer/miners then the qualified palaeontologist sub-contracted for this project, should visit the site to inspect the selected material and check the dumps where feasible.
6. Fossil plants or vertebrates that are considered to be of good quality or scientific interest by the palaeontologist must be removed, catalogued and housed in a suitable institution where they can be made available for further study. Before the fossils are removed from the site an AMAFA permit must be obtained. Annual reports must be submitted to AMAFA as required by the relevant permits.
7. If no good fossil material is recovered then no site inspections by the palaeontologist will be necessary. A final report by the palaeontologist must be sent to AMAFA once the project has been completed and only if there are fossils.
8. If no fossils are found and the excavations have finished then no further monitoring is required.

11. **Appendix A** – Examples of fossils from the Vryheid and Emakwezini Formations



Figure 4: Photographs of fossil plants from the Vryheid Formation, to assist the on-site responsible person.

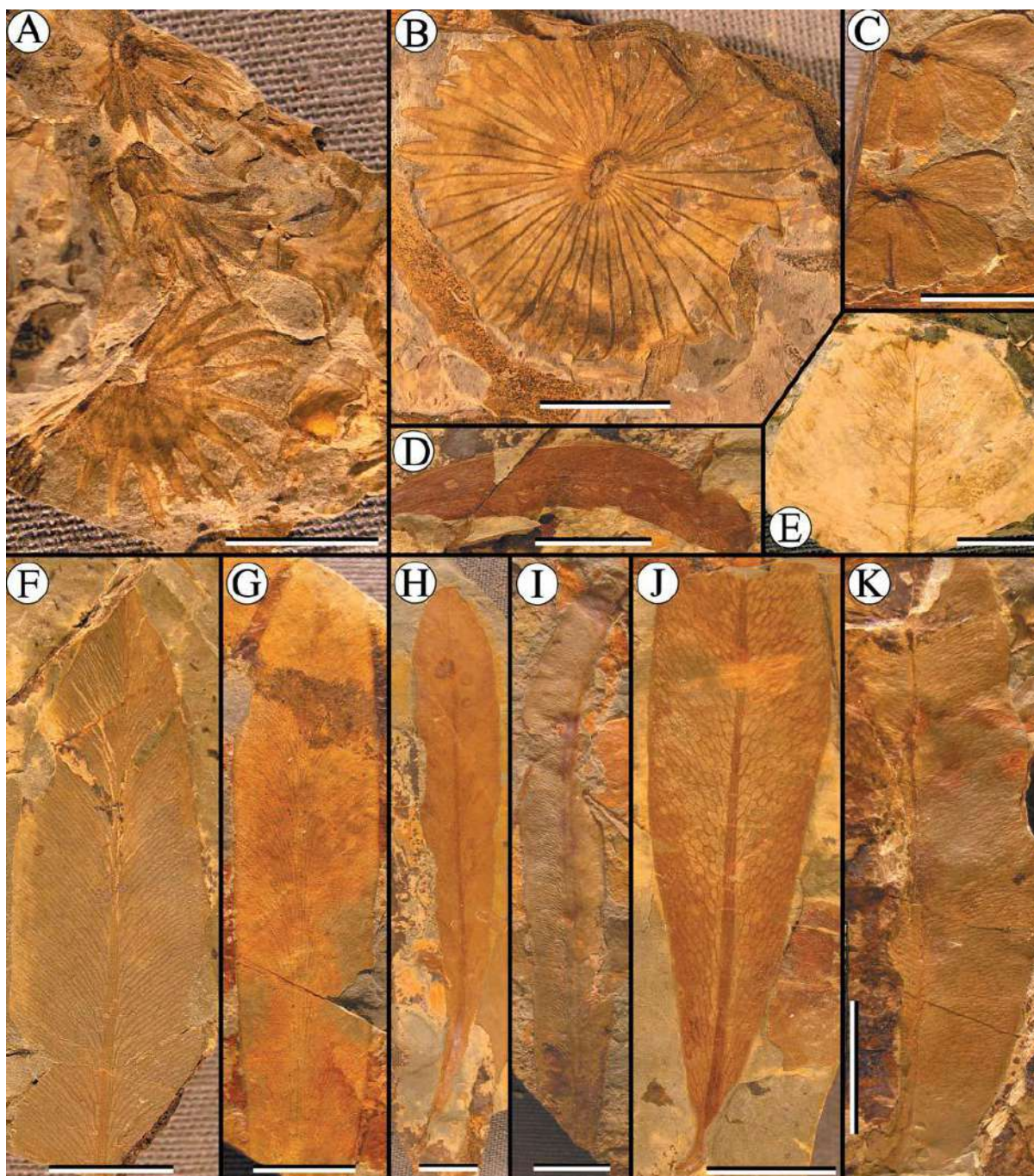


Figure 5: Photographs of fossil plants from the Emakwezini Formation (Bordy and Prevec, 2008; Plate II),

PHASE 1 ARCHAEOLOGICAL & HERITAGE IMPACT ASSESSMENT REPORT

THE PROSPECTING RIGHT APPLICATION OF
COAL ON LOT 289 EMPANGENI 13389 GU
AND LOT 285 EMPANGENI 13400 GU,
SITUATED IN KING CETSHWAYO DISTRICT
MUNICIPALITY, KWA-ZULU NATAL
PROVINCE.

VAHLENGWE MINING
ADVISORY AND
CONSULTING (PTY) LTD



MARCH, 2026



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ACKNOWLEDGEMENT

Tsimba Archaeological Footprints would like to acknowledge the Zulu people as the Traditional Custodians of the Zulu Nation and culture, their connections to land, sea and community. We pay our respect to their Elders past and present and extend that respect to all the traditional chiefs of this nation and the continuation of cultural, spiritual and educational practices of the Zulu peoples.

AUTHOR'S CREDENTIALS

A summary of their experience, qualifications, membership numbers and accreditation level



Academic Qualifications

Ph.D Heritage Candidate
MA Heritage Studies
MA CDS
Hon. Archaeology

Years of Experience

Ten Years

Associations &Accreditations

ASAPA
IAIAsa
ACHS
APHP
SAB

The report was authored by Mr. Roy Muroyi, **Principal Heritage Specialist and Archaeologist** for **Tsimba Archaeological Footprints (Pty) Ltd.** Roy carrier as an Archaeologist kicked off at the **Department of National Museums and Monuments of Botswana** where he worked as an Archaeological Impact Assessment adjudicating officer in 2013.

After leaving the **Department of National Museums and Monuments of Botswana** Mr. Muroyi moved to South Africa where he got involved with several **Cultural Resources Management** consulting firms before eventually settling at **Tsimba Archaeological Footprints (Pty) Ltd.** He has vast experience conducting **Heritage Impact Assessment** surveys for proposed Phase 1 and 2 **Heritage Impact Assessments** for:- Linear developments, Projects with an area over 5000m², Heritage buildings/Old buildings (demolitions and alterations), Old Bridges (demolitions) Water Pipelines, and etc . He has so far conducted Archaeological surveys in **Botswana, Malawi, South Africa** and **Western Australia**.

He is accredited with the Association of **Southern African Professional Archaeologists**, **Association of Professional heritage Practitioners** and the **Association of Australian Archaeologists**. He further holds memberships of the **International Association for impact Assessment South Africa**, the **Association of Critical Heritage Studies** and the **Association of Black Archaeologists**.

Muroyi is a **Ph.D Candidate** at the **University of Witwatersrand –Johannesburg**. His study, titled **“Undisciplined Archaeology” and Decolonial Heritage: Exploring Narratives and Memory in the uKhahlamba Drakensberg Park cultural landscape**”, challenges the disciplinary boundaries that have historically separated archaeology from heritage. His work emphasizes the importance of integrating these fields for their historical significance, contemporary relevance, and future potential.

SPECIALIST DECLARATION OF INDEPENDENCE

I, _____ Roy Muroyi _____, declare that –

- *I act as the independent specialist in this application;*
- *I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;*
- *I declare that there are no circumstances that may compromise my objectivity in performing such work;*
- *I have expertise in conducting the specialist report relevant to this application, including knowledge of the Act, Regulations and any guidelines that have relevance to the proposed activity;*
- *I will comply with the Act, Regulations and all other applicable legislation;*
- *I have no, and will not engage in, conflicting interests in the undertaking of the activity;*
- *I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing - any decision to be taken with respect to the application by the competent authority; and - the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;*
- *all the particulars furnished by me in this form are true and correct; and*
- *I realise that a false declaration is an offence in terms of regulation 48 and is punishable in terms of section 24F of the Act.*

Signature of the Specialist

A handwritten signature in black ink. It begins with a large, stylized capital letter 'R' enclosed within a circle. A horizontal line extends from the right side of the circle, followed by a series of loops and a final vertical stroke that ends in a small crossbar, resembling a stylized 'M' or 'J'.

DOCUMENT INFORMATION

DOCUMENT INFORMATION ITEM	DESCRIPTION
Proposed development and location	Phase 1 Heritage Impact Assessment (HIA) for the proposed coal prospecting right on lot 289 Empangeni 13389 GU, lot 285 Empangeni 13400 GU, situated in King Cetshwayo District, Kwa-Zulu Natal Province
Purpose of the study	To carry out a Phase 1 Heritage Impact Assessment to determine the presence/absence of archaeological assess their archaeological significance in terms of the KwaZulu Natal Amafa and Research Institute Act, 2018 (Act No 5 of 2018) and SHARA guidelines.
Municipalities	King Cetshwayo District Municipality
Client Details	Name : Niel Van Zyl Postal Address: Plot 1 AH, Sapfo Valtaki, Gauteng 1020 Phone: +27 82 461 3787 E-mail: neil@exicon.co.za
EAP Details	Vahlengwe Mining Advisory and Consulting (Pty) Ltd Contact Person: Sunday Mabaso Phone: +27 11 432 0062 Email: info@vahlengweadvisory.co.za
Heritage Consultant	Tsimba Archaeological Footprints (Pty) Ltd Address: 24 Lawson Mansions 74 Loveday Street, Johannesburg Gauteng, 2000 E-mail: rmuroyi23@gmail.com Phone : (+27) 813 717 993

EXECUTIVE SUMMARY

Heritage Impact Assessments (HIAs) are studies conducted by qualified heritage specialists that aim to identify heritage resources within a proposed development area, assess their significance, assess the impact of the development on the heritage resources and provide relevant mitigation measures to alleviate impacts to the heritage resources.



Assessment Type

Archaeo- Heritage Assessment

Heritage Legislation

KZN Amafa Act, 5 of 2018

Municipality

King Cetshwayo District
Municipality

Date of Field Survey

13-March-2026

Fatal Flaws

None

Tsimba Archaeological Footprints (Pty) Ltd was requested by Vahlengwe Mining Advisory and Consulting (Pty) Ltd to conduct a **Phase 1 Heritage Impact Assessment (HIA)** for the proposed **Molobedu Makoweni** coal prospecting right on lot 289 Empangeni 13389 GU, lot 285 Empangeni 13400 GU, situated in King Cetshwayo District, Kwa-Zulu Natal Province.

The **Molobedu Makoweni** application area extent is approximately 1.200 ha and therefore triggers 41 (1) (c) (i) (ii) and (iii) of the **KwaZulu-Natal Amafa and Research Institute Act, 2018 (Act No 5 of 2018)** which lists developments or activities that may require an HIA. **Section 41 (1) (c) refers to:** → *any development or other activity which will change the character of a site– exceeding 5000 m² in extent;* → *(ii) any development or other activity involving three or more existing erven or subdivisions thereof; and* → *(iii) any development or other activity involving three or more erven or divisions thereof which have been consolidated within the past five years.*

The objective of the report is to fulfil the requirements of **SAHRA** in the in terms of in sections 41 (1)(c) (i) (ii) and (iii) of the **KwaZulu-Natal Amafa and Research Institute Act, 2018 (Act No 5 of 2018)**. The proposed development may also impact graves, structures, archaeological and palaeontological resources that are protected in terms of sections 37, 38, 39, and 40 of the **KwaZulu-Natal Amafa and Research Institute Act, 2018**. This Act is implemented by Amafa Research and Institute, the provincial heritage resources authority charged to provide for the conservation, protection and administration of both the physical and the living or intangible heritage resources of the province; along with a statutory Council to administer heritage conservation in the Province.

The heritage data base shows the study area as very important in the rise of Shaka Zulu and the ultimate expansion of the Zulu empire. Reports indicate the disheartened once mighty Ndwandwe once spent a cold and hungry night on the Mhlatuze River's south bank while away from running from Shaka Zulu during the Ndwandwe–Zulu War of 1817–1819. Colonisation brought about immediate changes in the area. This saw the forests and lush fields enticing people, and commercial farming in the limited coastal area began (current surroundings of the N2 highway). Empangeni (the location of the previous mission station) grew to meet the social and commercial demands of the predominantly frontier farming population. In 1894, a magistrate was appointed, and the Zululand Railway was built in 1903, connecting the settlement to Durban.

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ABBREVIATIONS

Acronyms	Description
AIA	Archaeological Impact Assessment
ASAPA	Association of South African Professional Archaeologists
CRM	Cultural Resource Management
EAP	Environmental Assessment Practitioner
EIA	Environmental Impact Assessment
ESA	Early Stone Age
GIS	Geographic Information System
GPS	Global Positioning System
HIA	Heritage Impact Assessment
LSA	Late Stone Age
LIA	Late Iron Age
MIA	Middle Iron Age
MSA	Middle Stone Age
SAHRA	South African Heritage Resources Agency

GLOSSARY

Achievement	≠ Something accomplished, esp. by valour, boldness, or superior ability
Aesthetic	≠ Relating to the sense of the beautiful or the science of aesthetics.
Community	≠ All the people of a specific locality or country
Culture	≠ The sum total of ways of living built up by a group of human beings, which is transmitted from one generation to another.
Cultural	≠ Of or relating to culture or cultivation.
Diversity	≠ The state or fact of being diverse; difference; unlikeness.
Geological (geology)	≠ The science which treats of the earth, the rocks of which it is composed, and the changes which it has undergone or is undergoing.
High	≠ Intensified; exceeding the common degree or measure; strong; intense, energetic
Importance	≠ The quality or fact of being important.
influence	≠ Power of producing effects by invisible or insensible means.
Potential	≠ Possible as opposed to actual.
Integrity	≠ The state of being whole, entire, or undiminished.
Religious	≠ Of, relating to, or concerned with religion.
Significant	≠ important; of consequence
Social	≠ Living, or disposed to live, in companionship with others or in a community, rather than in isolation.
Spiritual	≠ Of, relating to, or consisting of spirit or incorporeal being.
Valued	≠ Highly regarded or esteemed

1.0 THE PROJECT

Summary of project description and why the developer is proposing to construct and/or develop and how it will benefit local economic market needs. Also summarises the application for approvals process, the name of the local heritage authority and the name of the heritage specialist company who were appointed to conduct the survey.



Client

Molobedu Makoweni (Pty)
Ltd

EAP

Vahlegwe Mining
Advisory and Consulting
(Pty) Ltd

DMRE REF

KZN 30/5/1/1/2/ 12129 PR

Project Type

Prospecting

Molobedu Makoweni (Pty) Ltd (the Client) proposes to prospect for chrome, manganese, coal and gold prospecting activities in respect of coal on lot 289 Empangeni 13389 GU, lot 285 Empangeni 13400 GU, situated in King Cetshwayo district, Kwa-Zulu Natal Province.

The prospecting for chrome, manganese, coal and gold prospecting activities in respect of coal on lot 289 Empangeni 13389 GU, lot 285 Empangeni 13400 GU is referred to by the DMRE as KZN 30/5/1/1/2/ 12129 PR.

The **Molobedu Makoweni** application area extent is approximately 1.200 ha and therefore triggers 41 (1) (c) (i) (ii) and (iii) of the **KwaZulu-Natal Amafa and Research Institute Act, 2018 (Act No 5 of 2018)** which lists developments or activities that may require an HIA. **Section 41 (1) (c) refers to: → any development or other activity which will change the character of a site– exceeding 5000 m² in extent; → (ii) any development or other activity involving three or more existing erven or subdivisions thereof; and → (iii) any development or other activity involving three or more erven or divisions thereof which have been consolidated within the past five years.** As part of the process **Vahlegwe** also requested **Tsimba Archaeological Footprints** to conduct a heritage impact assessment (**HIA**) as part of the **EA** process.

The proposed mining operation is anticipated to yield both beneficial and adverse environmental effects. On the positive side, it is expected to generate employment opportunities, stimulate local economic growth, and meet the rising demand for construction materials essential to infrastructure development.

-Aims of the Study -

- ⌘ Fulfill the statutory requirements of the KwaZulu-Natal Amafa and Research Institute Act, 2018 (Act No 5 of 2018).
- ⌘ To identify and describe, (in terms of their conservation and / or preservation importance) sites of cultural and archaeological importance that may be affected by the proposed development project.
- ⌘ Identify and describe impacts to archaeological and cultural resources, including intangible heritage resources.
- ⌘ Make recommendations on mitigation measures.
- ⌘ Identify and describe management measures.

- ⌘ Survey the project area to identify and describe sites of archaeological, historical or cultural interest affected by the proposed development.
- ⌘ Liaise with the local communities and stakeholders (if applicable) with regards to the impact of the development on the heritage resources.
- ⌘ Produce a detailed technical HIA report describing the importance or significance of known heritage resources and whether these resources need to be conserved/protected
- ⌘ Describe, in an HIA report, the procedures for mitigation of sites and provide an indication of time required for these management measures to be implemented.

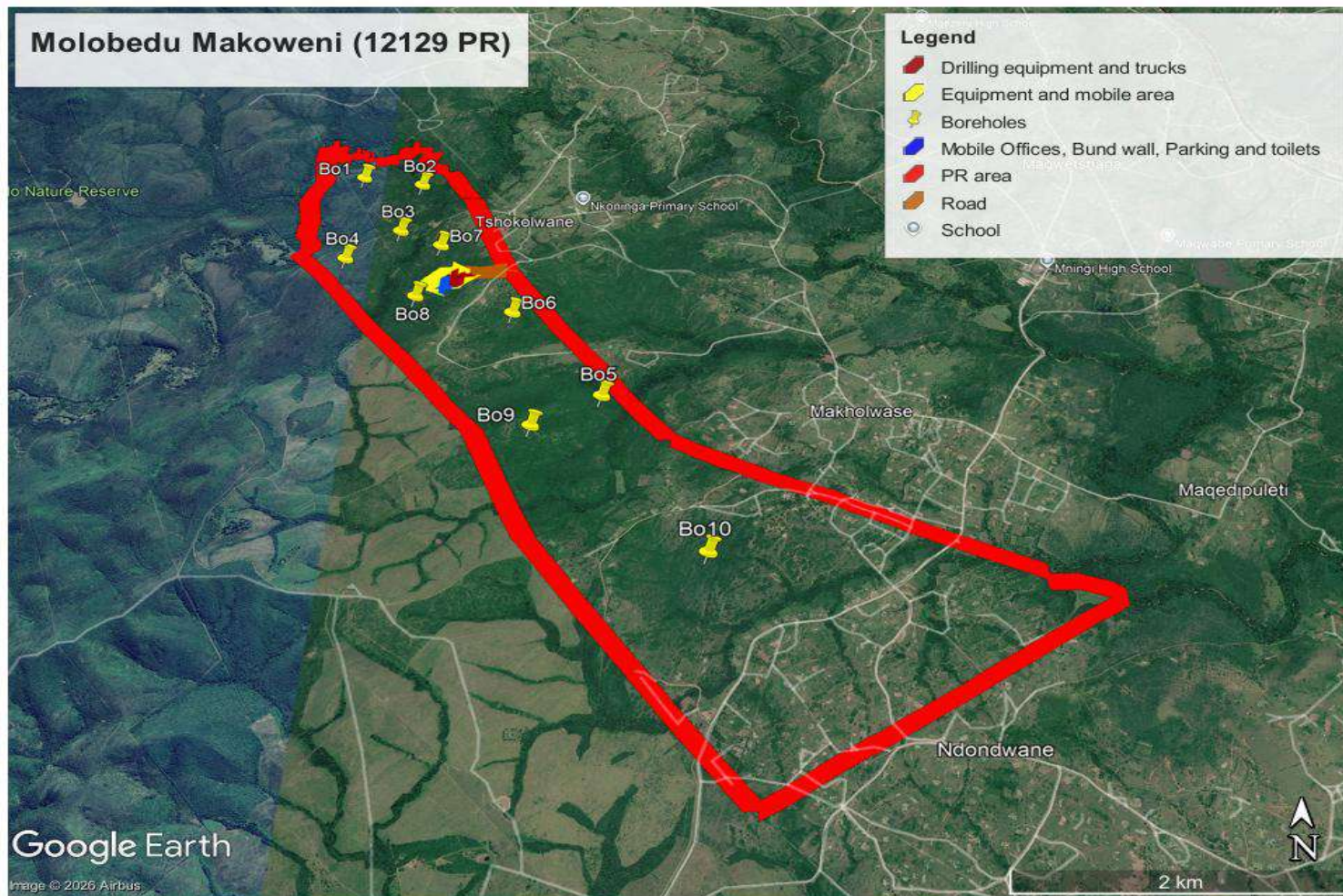


Figure 1: Proposed Site Plan and location of the study area (Vahlengwe)

2.0 DESCRIPTION OF THE RECEIVING ENVIRONMENT

Description of soil typology, basic geology and settlement patterns, these may be used as an indicator for heritage sensitivity in specific cases or area.



Closest Settlement

Tshokolwane
Makholwase
Maqedipuleti
Ndondwane
Ellingham
Heatoville
Ntambanana
Bambela

Topography

Rolling Terrain

Vegetation Cover

Low- Medium

Property Locality:

The proposed application KZN 30/5/1/1/2/ 12129 PR project is situated 19 km North of Empangeni and 21 km West of KwaMbonambi town, accessible via the R34 access road.

Geographical Landscape

The landscape's geomorphology can be described as a low-relief area bordered by a shoreline and a high-relieve terrain on the landward side. The area, which is part of the Zululand Coastal Plain, has a history of erosion and sedimentation, as well as sea level variations. Past geomorphologic processes created a one-of-a-kind terrain that supports complex hydrological systems, resulting in a high level of species diversity. Natural floods, climate change, and sea level rise all threaten the low-lying coastal floodplain, potentially increasing flood hazards over time. As a result, landscape characteristics play an essential role in decision-making and development planning.

Terrain

Rolling terrain

Ground conditions

During the field survey, ground visibility was low to medium , the study was carried out during the rainy season when vegetation cover was dense.

Extent of Property

1.200 ha

Water Sources

Drainage patterns in the vicinity are shaped by a network of seasonal streams and minor watercourses that ultimately feed into larger river systems in the region, such as the uMhlatuze River catchment, small streams like Nseleni, Ntseleni, Mfazi and Mphukatwane exist in the area. These water features contribute to moderately fertile soils, often comprising sandy loams and clay-rich substrates derived from underlying sedimentary formations.

3.0 METHODOLOGY

The methodology used to identify potential impacts and risks to heritage resources.

-Literature review-

The methodology used in this HIA is based on a comprehensive understanding of the current or baseline situation; the type, distribution and significance of heritage resources as revealed through desk-based study and additional data acquisition, such as archaeological investigations, built heritage surveys, and recording of crafts, skills and intangible heritage. This is systematically integrated using matrices with information on the nature and extent of the proposed engineering and other works to identify potential. The following tasks were also undertaken in relation to the cultural heritage and are described in this report:

The background information search of the proposed development area was conducted following the site maps from the client. Sources used in this study included:

- Published academic papers and HIA and **Palaeontological Impact Assessment (PIA)** studies conducted in and around the region where the proposed infrastructure development will take place;
- Available archaeological literature on the study area was consulted;
- The **South African Heritage Resources Information System (SAHRIS)** website and the National Data Base were consulted to obtain background information on previous heritage surveys and assessments in the area; and other planning documents.
- Map Archives - Historical maps of the proposed area of development and its surrounds were assessed to aid information gathering of the proposed area of development and its surrounds.

-Field Survey-

The field survey for the proposed development was conducted by Three Archaeologists from **Tsimba Archaeological Footprints** on the 13th of March 2026. The survey was conducted through driving and walking. A ground survey, following standard and accepted archaeological procedures, was conducted. The survey also paid special attention to disturbed and exposed layers of soils such as eroded surfaces. These areas are likely to exposed or yield archaeological and other



Documents Reviewed

Archaeological Impact
Assessments
Heritage Impact
Assessments
Palaeontological Impact
Assessments
Historical Maps



Equipment Used

Garmin GPSMAP 64s
IPhone Camera
Samsung Satellite Tablet

heritage resources that may be buried underneath the soil and be brought to the surface by animal and human activities including animal barrow pits and human excavated grounds.

-Data Consolidation and Report Writing

Data captured on the development area (during the field survey) by means of a desktop study and physical survey is used as a basis for this HIA. This data is also used to establish assessment for any possible current and future impacts within the development footprint. **This includes the following:**

- Assessment of the significance of the cultural resources in terms of their archaeological, built environment and landscape, historical, scientific, social, religious, aesthetic and tourism value;
- A description of possible impacts of the proposed development, especially during the construction phase, in accordance with the standards and conventions for the management of cultural environments;
- Proposal of suitable mitigation measures to minimise possible negative impacts on the cultural environment and resources that may result during construction;
- Review of applicable legislative requirements, that is, the **NEMA (read together with the 2014 EIA Regulations of 2014, as amended)** and the NHRA.
- The consolidation of the data collected using the various sources as described above;
- Acknowledgement of impacts on heritage resources (such as unearthed graves) predicted to occur during construction; and **Geographical Information Systems (GIS)** mapping of known archaeological sites and maps in the region.
- A discussion of the results of this study with conclusions and recommendations based on the available data and study findings.

4.0 LEGISLATIVE FRAMEWORK

Summary of which legislation (including the relevant NHRA section) and local by-laws are triggered by the proposed development, and those identified are subsequently outlined and quoted.



Legislations

NEMA, Act No. 107 of 1998
NHRA, Act No. 25 of 1999
KZN Amafa, Act No. 5 of 2018

This **Heritage Impact Assessment (HIA)** is undertaken as part of the **Environmental Authorisation (EA)** process required in terms of the **National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA)**. The proposed development is subject to an **Environmental Impact Assessment (EIA)**, within which heritage resources must be identified, assessed, and managed in accordance with applicable heritage legislation.

Vahlegwe Mining Advisory and Consulting (Pty) Ltd has been appointed to obtain EA for the proposed development. As part of this process, **Tsimba Archaeological Footprints** was commissioned to undertake the **HIA** to assess potential impacts on heritage resources within the study area. **NEMA** provides the overarching framework for environmental management in South Africa. It requires that the potential impacts of listed activities on the environment be assessed prior to authorisation. The environment is defined broadly to include cultural and historical aspects, thereby incorporating heritage resources into the **EIA** process. In terms of **NEMA**, heritage resources are considered part of the environment and must be assessed to ensure that development is socially, environmentally, and culturally sustainable.

The **KwaZulu-Natal Amafa and Research Institute Act, 2018 (the Amafa Act)** is the primary provincial legislation governing the protection and management of heritage resources within **KwaZulu-Natal**. **Amafa aKwaZulu-Natali** is the responsible authority. Section 41 of the **Amafa Act** outlines circumstances under which a Heritage Impact Assessment is required prior to the commencement of certain developments or activities.

The proposed development covers approximately 9 hectares and therefore triggers Section 41(1)(c)(i), (ii), and (iii) of the Act.

Section 41(1)(c) applies to:

- any development or activity that will change the character of a site exceeding 5 000 m² in extent;

- any development or activity involving three or more existing erven or subdivisions thereof; and
- any development or activity involving three or more erven or subdivisions thereof which have been consolidated within the past five years.

As the proposed development exceeds the 5 000 m² threshold and may involve multiple erven or subdivisions, a Heritage Impact Assessment is required. The proposed development may also impact graves, structures, archaeological and palaeontological resources that are protected in terms of sections **37, 38, 39, and 40** of the **KwaZulu-Natal Amafa and Research Institute Act, 2018**. This **Act** is implemented by **Amafa Research and Institute**, the provincial heritage resources authority charged to provide for the conservation, protection and administration of both the physical and the living or intangible heritage resources of the province; along with a statutory Council to administer heritage conservation in the province.

Although heritage management in **KwaZulu-Natal** is primarily governed by the **Amafa Act**, the **National Heritage Resources Act (NHRA)** provides the national framework for heritage resource management.

The **NHRA** establishes a three-tier system of heritage resource management at national, provincial, and local levels, and defines categories of heritage resources and their significance. Key provisions include:

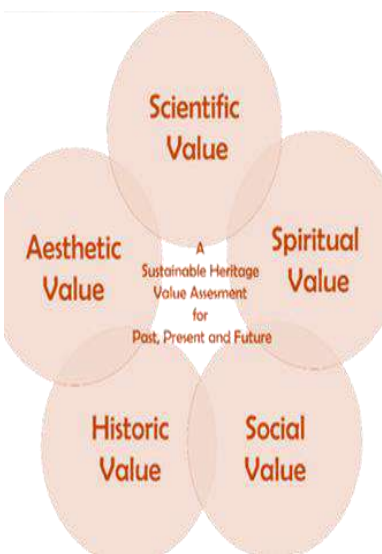
- Protection of archaeological and palaeontological sites and material;
- Protection of graves and burial grounds older than 60 years;
- Protection of structures older than 60 years;
- Requirement for permits for disturbance or destruction of protected resources.

The **NHRA** also promotes the conservation of heritage resources as part of sustainable development.

A **Phase 1 HIA** is a pre-requisite for development in South Africa as prescribed by **SAHRA** and stipulated by legislation. The overall purpose of heritage specialist input is to:

- Identify any heritage resources, which may be affected;
- Assess the nature and degree of significance of such resources;
- Establish heritage informants/constraints to guide the development process through establishing thresholds of impact significance;
- Assess the negative and positive impact of the development on these resources; and
- Make recommendations for the appropriate heritage management of these impacts.

The Burra Charter- ICOMOS (2013)



Burra Charter Values

Although not a statutory instrument, the **Australia ICOMOS Burra Charter (2013)** is widely recognised as a key guiding document for heritage conservation practice in Australia and is routinely applied in the preparation and assessment of HIAs. The Burra Charter establishes nationally accepted principles for the identification, assessment, and management of places of cultural heritage significance.

Central to the Burra Charter is the concept of cultural significance, which encompasses aesthetic, historic, scientific, social, and spiritual values for past, present, and future generations. The Charter promotes a cautious and informed approach to heritage management, encapsulated in the principle of doing “as much as necessary, but as little as of Heritage Impact Assessments, the Burra Charter provides guidance on:

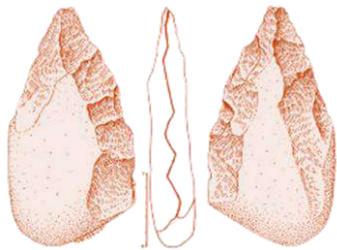
- The assessment of significance prior to any development or intervention;
- The importance of retaining heritage places in situ wherever feasible;
- The requirement to minimise impacts and ensure that any changes are reversible where possible;
- The need for appropriate documentation and recording of heritage resources.

The application of the Burra Charter is supported by, and complements, relevant statutory frameworks such as the NHRA (Act No. 25 of 1999) in South Africa and applicable

provincial legislation. While legislation provides the legal basis for heritage protection, the Burra Charter informs best-practice methodologies and ethical standards in heritage assessment and conservation.

5.0 ARCHEOLOGICAL AND HISTORICAL BACKGROUND OF THE STUDY AREA

Archaeological background of a place encompasses the intricate interplay of social, geographical, and cultural elements that shape its identity. This background is often reflected in the evolution of place names, which carry archaeological memories of communities, conflicts, beliefs, and policies



Stone Age Period (3ml-2ka)

Early Stone Age
Middle Stone Age
Later Stone Age

-Historical Background of the Study area-

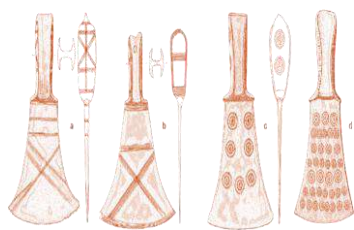
The project area is located approximately 19 km north of Empangeni and 21 km west of KwaMbonambi, and is accessible via the R34. Both study areas fall within a landscape of high archaeological and historical sensitivity.

The broader region forms part of the traditional heartland of Nguni-speaking communities and later the Zulu kingdom. Prior to the 19th century, the area was occupied by dispersed homesteads associated with agro-pastoralist societies, typically organised under local chiefdoms. These settlements were closely tied to access to arable land, grazing, and water, and are often represented archaeologically by stone-packed features, middens, and burial areas.

During the early 19th century, the region became incorporated into the expanding Zulu kingdom under Shaka kaSenzangakhona (c. 1787–1828). With the support of Dingiswayo of the Mthethwa, Shaka consolidated power and integrated neighbouring groups into a centralised polity (Morris 1965). Following the decline of the Mthethwa and the defeat of rival groups such as the Ndwandwe under King Zwide, the Zulu kingdom emerged as the dominant political force in the region.

These processes formed part of the Mfecane, a period of widespread conflict, migration, and settlement reorganisation across southern Africa. The dispersal of groups such as the Ndwandwe led to the establishment of Ngoni polities further north, while the core of KwaZulu-Natal, including the Empangeni–Melmoth region, remained under Zulu influence (Iliffe 1969).

The area is also associated with historically significant Zulu-speaking groups, including the Mkhwanazi and other clans with long-standing ties to the coastal and inland zones



Iron Age Period (250 CE to 1850 CE)

Early Iron Age
Middle Iron Age
Later Iron Age



Rock Art Dating (28,000)

of northern KwaZulu-Natal. These communities maintained settlement systems, land-use practices, and cultural traditions that continue to shape the cultural landscape.

The wider region of northern KwaZulu-Natal contains numerous formally recognised heritage sites and places of cultural significance associated with the Zulu kingdom and related historical events. Notable sites in the broader study area include:

- Mpande's Grave, Nodwengu
- Ondini Cultural Museum and the site of King Cetshwayo's Royal Residence
- Gqokli Hill Battlefield
- King Shaka's Grave
- King Senzangakhona's Grave
- King Cetshwayo's Grave
- eMakhosini-Ophathe Heritage Park
- Ndongakusuka (Battle site)
- Mgungundlovu (Royal capital of King Dingane)

These sites highlight the high cultural and historical sensitivity of the region and reinforce the importance of carefully assessing and managing potential impacts on heritage resources within and around the proposed development areas.

-Archaeological Background of the Study area-

The archaeological heritage materials of all types of significance are abundant around the uMhlathuze area. Despite the fact that a large number of sites have been recorded, there are still gaps in the data on the local heritage. A desktop survey revealed a total of 125 archaeological sites dating from the Stone Age to the modern era. Within the municipal area, the majority of the locations recorded indicated pressure from mining and infrastructural development.

Frans Prins (2017) noted that several heritage sites of importance are located in the general area, especially within the Umfolozi-Hluluwe Nature Reserve. These include: ESA, MSA, LSA sites, as well as several rock art sites. The importance of the greater Empangeni area in terms of the development of the Zulu state of King Shaka Zulu in the early 1800's is also noted. Sites containing rock art from the San and Khoekhoen culture groups can also be found in this area during the Late Stone Age. Early and Middle

Stone Age sites are rare in this area, while rock art and Late Stone Age sites are far more well-known. Modern man, or *Homo sapiens*, evolved during the Middle Stone Age, 200 000 years ago, producing a greater range of tools with more advanced technologies than those of preceding times. As a result, experienced hunter-gatherer communities were able to adapt to a variety of situations. From this point forward, rock shelters and caves were used for long periods of time for occupation and reoccupation.

The Middle Stone Age (MSA), as defined by Goodwin and Van Riet Lowe (1929), was supposed to be a transitional period between the Earlier and Later Stone Ages, with a shift in technology from core to flake tools (LSA). The MSA was characterised by triangular flakes with convergent dorsal scars and faceted butts, and radial and discoidal forms, as well as single and double platform specimens, dominated cores. The worked flake point was thought to be the 'typical fossil.' It has been challenging to integrate all MSA assemblages within Goodwin and Van Riet Lowe's criteria because to the MSA's very large time range (c. 250 000-20 000BP) and the considerable degree of regional diversity. Recent attempts to alter the MSA's definition and develop a cultural sequence (Klein 1970; Beaumont & Vogel 1972; Volman 1984) have met with minimal success.

As a result, finding and comprehending the MSA's conclusion remains a challenge. In southern Africa, disagreements about the MSA/LSA transition centre on four issues: 1) the definition of final MSA technology; 2) the existence of a transitional MSA/LSA industry; 3) the timing of the MSA/LSA transition; and 4) the existence of an Early LSA (ELSA), which represents a distinct industry that is not part of the earliest recognized LSA, the Robberg (Clark, 1997). Kaplan's 1985 excavation of the Umhlatuzana rock shelter in Natal uncovered a long and extensive sequence of stone artefacts spanning the Middle Stone Age (MSA) to the Later Stone Age (LSA), including the MSA/LSA transition and early LSA microlithic bladelet assemblages. Between 35 000 and 25 000 BP, the transition from the MSA to the start of the LSA occurred. Umhlatuzana's Robberg-like assemblages are the first to be positively recognized in Natal.

They reveal that assemblages of this type were created earlier and later in Natal than elsewhere in the country, predating 18 000 BP and postdating 12 000 BP. Changes in the Umhlatuzana stone artefact assemblages were the consequence of a single

evolving cultural tradition along a trajectory of cultural and social development, rather than the arrival of new types of tools from elsewhere (Kaplan, 1986). Wadley's recent research on the Middle Stone Age at Sibudu Cave, north of Durban, revealed that based on backed blades, distinctions between the Middle Stone Age and the Late Stone Age can be misleading (Wadley, 2005). Despite the fact that research on MSA sites is sparse, this study highlights the importance of further exploring Stone Age sites in KZN.

The forebears of the San and Khoi Khoi are related with the Late Stone Age, which is thought to have begun around 20 000 years ago. In some parts of South Africa, Stone Age hunter-gatherers lived long into the nineteenth century. Mining activities, urbanisation, industrialisation, agriculture, and other development activities may have erased an unknown number of Stone Age sites across the region in recent decades. In this area, there is a great number of Rock-Art sites. Mazel conducted a survey of the Drakensberg and Southern Natal in 1981, documenting over 400 rock art sites and over 20,000 paintings (Mazel, 1981).

-Iron Age Period-

The archaeological study done by Anderson (2008) to the south of the study area located thin-walled pottery fragments possibly dating to the LIA. The LSA, which dates from roughly 30 000 to 2 000 (perhaps later) years ago, has more information than the earlier MSA and ESA. This is due to the fact that LSA sites are newer than ESA and MSA sites, allowing for better preservation of a wider range of organic archaeological material. The San (Bushmen) or their direct ancestors are commonly connected with the Later Stone Age. This period's implements were significantly smaller and more varied than the preceding Middle Stone Age period's. Several farming peoples from eastern and south-central Africa began to settle along the east coast and river basins that flow into the Indian Ocean during the third century AD (Maggs 1984a, 1989; Mitchell 2002). These early farmers in eastern South Africa showed a significant predilection for living in a savannah environment near major water bodies, where annual precipitation ranged from 400 to over 1000mm, providing ample moisture for grain production. In the Thukela Basin, more than thirty EIA identified communities are located on discontinuous patches of rich colluvial soils within a short distance of the Thukela River or its tributaries. When compared to the slower pace of the MSA, LSA

tool technology exhibits rapid stylistic change. During the last 10,000 years, the speed has been more apparent. The LSA tool sequence includes an informal small blade tradition from around 22,000 to 12,000 years ago, a scraper and adze-rich industry from 12,000 to 8,000 years ago, a backed tool and small scraper industry from 8,000 to 4,000 years ago, and a variable set of other industries from 4,000 to 8,000 years ago (Wadley, 2007). Adzes are thought to have been employed as woodworking tools, but they could also have been used to manufacture digging sticks and tool handles. Scrapers are tools that were once supposed to be used to prepare hides for garments and other leather products. Cutting tools with backs, as well as arrow tips, may have been utilized. The bow and arrow were also imported into southern Africa during the Later Stone Age - possibly around 20 000 years ago.

Later Stone Age people were significantly more efficient in exploiting their natural surroundings than Middle Stone Age people, thanks to the bow and arrow and the usage of traps and snares. In the fifth century AD, EIA villages were first built in the coastal forest, and afterwards in the savannah woodland area by rivers in the sixth century AD (seventh century AD). The palaeobotanical record, present vegetation pattern (Hall 1981), and settlement dispersion in the Thukela Basin all show that EIA farmers opened riverine forest and woodlands. All known sites are within 100 meters of the relic canopy edge (van Schalkwyk 1992). The most productive nodes of soils confined to confluences and colluvial slip-off slopes along the major drainage courses, which account for only approximately 9% of the landscape, are regularly located on EIA sites averaging 7 hectares in size (Maggs 1980: 7).

Table 1: Significance of Cultural Landscape Impacts

		Landscape receptor sensitivity		
		High	Medium	Low
Assessment of significance of the cultural landscape impacts ■ Red cells represent significant adverse impacts ■ Yellow cells represent significant beneficial impacts ■ Blue cells represent impacts that are not significant		Landscape with National heritage significance Status sites and cultural Landscapes with Provincial heritage Significance Status	Regional or Local Significance Heritage sites valued characteristics reasonably tolerant of changes of the type proposed.	A relatively unimportant cultural landscape with few features of value or interest, potentially tolerant of substantial change of the type proposed.
Major adverse	Significant adverse changes, over a significant area, to key characteristics or features or to the landscape's character or distinctiveness for more than 2 years	High adverse significance	High/Medium adverse significance	Medium adverse significance
Moderate adverse	Noticeable but not significant adverse changes for more than 2 years or significant adverse changes for more than 6 months but less than 2 years, over a significant area, to key characteristics or features or to the landscape's character or distinctiveness.	High/Medium adverse significance	Medium adverse significance	Low adverse significance
Slight adverse	Noticeable adverse changes for less than 2 years, significant adverse changes for less than 6 months, or barely discernible adverse changes for any length of time.	Medium adverse significance	Low adverse significance	Neutral
Neutral	Any change would be negligible, unnoticeable or there are no predicted changes.	Neutral	Neutral	Neutral
Slight benefit	Noticeable beneficial changes for less than 2 years, significant beneficial changes for less than 6 months, or barely discernible beneficial changes for any length of time.	Medium beneficial significance	Low beneficial significance	Neutral
Regional Cultural landscape		Regional or Local Significance Heritage sites valued characteristics reasonably tolerant of changes of the type proposed.		
Molobedu Makoweni Application Area		A relatively unimportant cultural landscape with few features of value or interest, potentially tolerant of substantial change of the type proposed.		

6.0 DISCUSSION OF FINDINGS

The discussion section is one of the final parts of this Report, in which an author describes, analyses, and interprets their findings.



Known Heritage Resources

0

Cultural Resources Recorded

0

Resource Types

0

The **Molobedu Makoweni** application areas were surveyed on the 13th of March 2026 using standard archaeological surveying methods. The area was surveyed using directional parameters supplied by the GPS and surveyed by foot. Three archaeologists from Tsimba Archaeological Footprints undertook the survey.

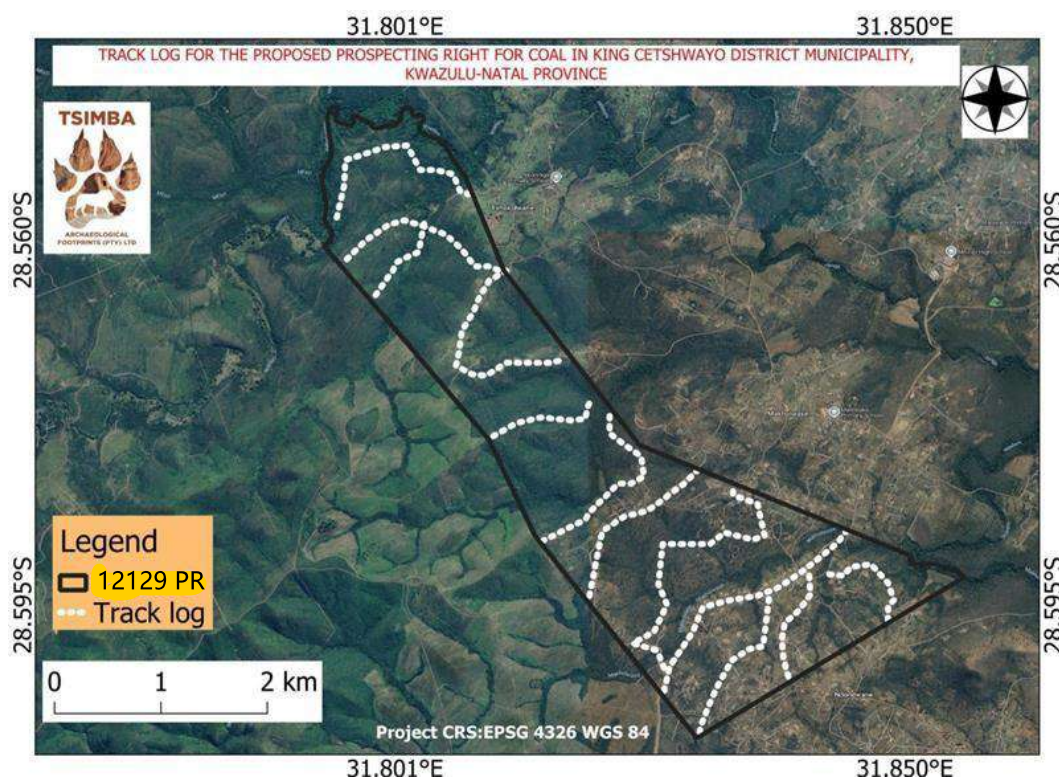


Figure 2: Field Track log of the surveyed areas

The application area is situated in a rural and agricultural zone defined by a mix of agricultural land uses, including cultivated fields and grazing areas, interspersed with patches of natural vegetation such as grassland, bushveld, and remnant coastal forest elements.

The area is marginally with developed land such as riverbanks, unused agricultural plots, or patches of vacant lands in some areas. The landscape is characterised by scattered homesteads, often arranged in small clusters associated with extended family

units. These homesteads are typically situated on individual land parcels and are connected by a network of gravel access roads branching off from the main R34 route. Settlement density is generally low, increasing slightly closer to transport routes and service nodes.

Residents rely on basic services, which are often limited or inconsistent. Water access may be through communal taps or informal connections. Rivers like; Nseleni, Ntseleni, Mfazi and Mphukatwane surround the study area. Roads and pathways are narrow, unpaved, and prone to flooding during heavy rains, affecting mobility and service delivery.

Pictographic presentation of the proposed coal prospecting area.



Figure 3: View of some power lines traversing through the project area in the Ndongwane area.



Figure 4: View of some homesteads in the Ndondwane area.



Figure 5: View of an undeveloped piece of land west of the Tshokolane area.



Figure 6: View of another developed piece of land proposed for prospecting.



Figure 7: View of an access road to some of the homesteads in the Makholwase area.



Figure 8: mountain view of the section north of the study area.



Figure 9: View of a water course and homesteads in the background.

7.0 ASSESSMENT OF SIGNIFICANCE

An impact can be defined as any change in the physical-chemical, biological, cultural and/or socio-economic environmental system that can be attributed to human activities related to alternatives under study for meeting a project need. The matrices use the consequence and the likelihood of the different aspects and associated impacts to determine the significance of the impacts.

An impact can be defined as any change in the physical-chemical, biological, cultural and/or socio-economic environmental system that can be attributed to human activities related to alternatives under study for meeting a project need. The significance of the aspects/impacts of the process will be rated by using a matrix adapted to some extent to fit this process. These matrices use the consequence and the likelihood of the different aspects and associated impacts to determine the significance of the impacts. The significance of the impacts will be determined through a synthesis of the criteria below:

Table 2: Significance of impacts synthesis criteria

Nature of the impact (N)		
Positive	+	Impact will be beneficial to the environment (a benefit).
Negative	-	Impact will not be beneficial to the environment (a cost).
Neutral	0	Where a negative impact is offset by a positive impact, or mitigation measures, to have no overall effect.
Magnitude(M)		
Minor	2	Negligible effects on biophysical or social functions / processes. Includes areas / environmental aspects which have already been altered significantly and have little to no conservation importance (negligible sensitivity*).
Low	4	Minimal effects on biophysical or social functions / processes. Includes areas / environmental aspects which have been largely modified, and / or have a low conservation importance (low sensitivity*).
Moderate	6	Notable effects on biophysical or social functions / processes. Includes areas / environmental aspects which have already been moderately modified and have a medium conservation importance (medium sensitivity*).
High	8	Considerable effects on biophysical or social functions / processes. Includes areas / environmental aspects which have been slightly modified and have a high conservation importance (high sensitivity*).
Very high	10	Severe effects on biophysical or social functions / processes. Includes areas / environmental aspects which have not previously been impacted upon and are pristine, thus of very high conservation importance (very high sensitivity*).
Extent (E)		

Site only	1	Effect limited to the site and its immediate surroundings.
Local	2	Effect limited to within 3-5 km of the site.
Regional	3	Activity will have an impact on a regional scale.
National	4	Activity will have an impact on a national scale.
International	5	Activity will have an impact on an international scale.
Duration (D)		
Immediate	1	Effect occurs periodically throughout the life of the activity.
Short term	2	Effect lasts for a period 0 to 5 years.
Medium term	3	Effect continues for a period between 5 and 15 years.
Long term	4	Effect will cease after the operational life of the activity because of natural process or by human intervention.
Permanent	5	Where mitigation there by natural process or by human intervention will not occur in such a way or in such a time span that the impact can be considered transient.
Probability of occurrence (P)		
Improbable	1	Less than 30% chance of occurrence.
Low	2	Between 30 and 50% chance of occurrence
Medium	3	Between 50 and 70% chance of occurrence.
High	4	Greater than 70% chance of occurrence.
Definite	5	Will occur, or where applicable has occurred, regardless or in spite of any mitigation measures.

Once the impact criteria have been ranked for each impact, the significance of the impacts will be calculated using the following formula:

$$\text{Significance Points (SP)} = (\text{Magnitude} + \text{Duration} + \text{Extent}) \times \text{Probability}$$

The significance of the archaeological impact is therefore calculated by multiplying the severity rating with the probability rating. The maximum value that can be reached through this impact evaluation process is 100 SP (points). The significance for each impact is rated as High (SP≥60), Medium (SP = 31-60) and Low (SP).

Table 3: Criteria for Rating of Classified Impacts

Significance of predicted NEGATIVE impacts		
Low	0-30	Where the impact will have a relatively small effect on the environment and will require minimum or no mitigation and as such have a limited influence on the decision
Medium	31-60	Where the impact can have an influence on the environment and should be mitigated and as such could have an influence on the decision unless it is mitigated.
High	61-100	Where the impact will definitely have an influence on the environment and must be mitigated, where possible. This impact will influence the decision regardless of any possible mitigation.
Significance of predicted POSITIVE impacts		
Low	0-30	Where the impact will have a relatively small positive effect on the environment.
Medium	31-60	Where the positive impact will counteract an existing negative impact and result in an overall neutral effect on the environment.
High	61-100	Where the positive impact will improve the environment relative to baseline conditions.

Table 4: Impact Assessment Matrix

Impacts and Mitigation measures relating to the proposed project during construction phase														
Activity/Aspect	Impact /	Aspect	Magnitude	Extent	Duration	Probability	Significance before mitigation	Mitigation measures	Magnitude	Extent	Duration	Probability	Significance after mitigation	
Clearing and Excavations	Destruction of archaeological remains	Cultural heritage	6	1	1	2	16	• Use chance find procedure to cater for accidental finds	2	1	1	1	4	
	Disturbance of graves	Cultural heritage	6	1	1	2	16	• Chance finds procedure and heritage induction for workers	3	2	2	1	4	
	Disturbance of buildings and structures older than 60 years old	Cultural heritage I	6	1	1	2	16	• Mitigations are given in the recommendations section	4	1	1	1	4	
Operational	Destruction of living heritage and public monuments	Cultural heritage	6	1	1	2	16	• Mitigation is not required because there are no public monuments within the proposed development site	2	1	1	4	4	

Table 5: Heritage Management Plan Input into Proposed Coal Prospecting Project

Objective		✓ Protection of archaeological sites and land considered to be of cultural value. ✓ Protection of known physical cultural property sites against vandalism, destruction and theft; and ✓ The preservation and appropriate management of new archaeological finds should these be discovered during construction.					
No.	Activity	Mitigation Measures	Duration	Frequency	Responsibility	Accountable	Informed
Pre-Construction Phase							
1	Planning	Ensure all known sites of cultural, archaeological, and historical significance are demarcated on the site layout plan and marked as no-go areas.	Throughout Project	Weekly Inspection	Contractor	Construction Manager	Environmental Practitioner
		Should any archaeological, cultural property heritage resources be exposed during excavation or be found on development site, a registered heritage specialist or Amafa research and Institute official must be called to site for inspection.	Throughout Project	Throughout	Contractor	Construction Manager	Environmental Practitioner
		Under no circumstances may any archaeological, historical or any physical cultural property heritage material be destroyed or removed from site;	Throughout Project	Throughout	Contractor	Construction Manager	Environmental Practitioner
		Should remains and/or artefacts be discovered on the development site during earthworks, all work will cease in the area affected and the Contractor will immediately inform the Construction Manager who in turn will inform Amafa Research and Institute	Construction Phase	When necessary	Contractor	Construction Manager	Environmental Practitioner
		Should any remains be found on site that is potentially human remains, Amafa research and Institute and South African Police Service should be contacted.	Construction phase	When necessary	Contractor	Construction Manager	Environmental Practitioner
Rehabilitation Phase							
		Same as construction phase.					
Operational Phase							
		Same as construction phase.					

Table 6: Site significance classification and ratings for heritage resources located in the project area

Heritage resource	#Number	Field rating	Grade	Significance	Recommended mitigation
Burial Site	0	None	None	Low	See below
Built environment	0	None	None	Low	See below
Archaeological Site	0	None	None	Low	See below
Memorials	0	None	None	Low	See below
Living Heritage	0	None	None	Low	See below
Rock Art	0	None	None	Low	See below
Midden	0	None	None	Low	See below

8.0 CONCLUSIONS

Brief summary of the findings and cultural heritage resources management goals that have been identified to guide the protection and public enjoyment of natural, cultural and recreational resources

Identified archaeological and heritage sites

The proposed site is situated within a rural landscape where local communities customarily inter their deceased within homestead boundaries. Owing to access limitations, the present study did not assess burial sites located within individual homesteads. According to the coal prospecting plans, these homesteads fall outside the footprint of the proposed development and are therefore unlikely to be impacted. Furthermore, no cultural heritage resources were identified within the designated coal prospecting areas.

- For the current study, as no other sites, features or objects of cultural significance were identified, impact of the proposed development is determined to be very low and no mitigation measures are proposed.
- The legal requirements related to heritage specifically are specified in Section 4 of this report.
- For this proposed project, the assessment has determined that no sites, features or objects of heritage significance occur in the project area.
- If archaeological features are identified during construction, as stated in the management recommendation, these finds would have to be assessed by a specialist, after which a decision will be made regarding the application for relevant permits.

This report concludes that there are no fatal flaws expected for this project. The impacts of the proposed development on the cultural landscape will not be significant as no cultural heritage resources were recorded during the field survey. The potential for stratified archaeological deposits was assessed as negligible given the local geology and predictive site patterning.

However archaeological deposits usually occur below ground level. Should archaeological artefacts or skeletal material be revealed in the area during development activities, according to the **KwaZulu Natal Amafa and Research Institute Act, 2018 (Act No 5 of 2018)** such activities should be halted, and a heritage specialist or the must

KwaZulu Natal Amafa and Research Institute be notified in order for an investigation and evaluation of the find(s) to take place. From a heritage perspective, the proposed development may be allowed to proceed subject to the recommendation given below. Measures for inclusion in the **EMPr** are also given in the recommendations below.

9.0 HERITAGE MANAGEMENT RECOMMENDATIONS

Description and discussion of any no-go areas that have already been identified at this stage and must be further examined during the HIA

Based on the survey outcomes, **Tsimba Archaeological Footprints** has developed the following recommendations to assist **Molobedu Makoweni** with the management of the identified cultural heritage values in the area.

1

Molobedu Makoweni is advised that although no cultural heritage resources were identified within the proposed coal prospecting areas, it is recommended that a chance finds procedure be implemented during all ground-disturbing activities. This will ensure that any previously unidentified heritage resources are appropriately managed if encountered.

2

Molobedu Makoweni is advised that if any graves, human remains, or other cultural heritage materials be discovered during prospecting or development activities, all work in the immediate vicinity must cease immediately, and the relevant heritage authorities should be notified in accordance with applicable legislation.

3

Molobedu Makoweni is advised that while no heritage resources were identified within the proposed spheres of activity, should they wish to extend the scope of works beyond the current (given) scope, another Heritage assessment would have to be carried out.

4

Molobedu Makoweni is advised that should any unmarked burials be exposed during construction, affected families must be tracked and consulted, relevant rescue/ relocation permits must be obtained from **SAHRA** before any grave relocation can take place. Furthermore, a professional archaeologist must be retained to oversee the relocation process in accordance with the **KwaZulu Natal Amafa and Research Institute Act, 2018 (Act No 5 of 2018)**.

5

Molobedu Makoweni is advised that if chance archaeological materials or human burials remains be exposed during construction phase, work should cease on the affected area and the discovery must be reported to the heritage authorities immediately so that an investigation and evaluation of the finds can be made

6

Molobedu Makoweni should advise their contractors and workers of the penalties associated with the unlawful removal of cultural, historical, archaeological or palaeontological artefacts, as set out in the **KwaZulu Natal Amafa and Research Institute Act, 2018 (Act No 5 of 2018)**.

7

Molobedu Makoweni is advised that during the construction phase, there is always a risk of uncovering archaeological, palaeontological, or heritage resources unexpectedly. To manage this, a **Chance Finds Procedure** (sometimes called an Unexpected Finds Procedure) must be in place.

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APPENDIX A: DEFINITION OF TERMS ADOPTED IN THIS HIA

The terminology adopted in this document is mainly influenced by the NHRA of South Africa (1999) and the Burra Charter (1979).

Adaptation: Changes made to a place so that it can have different but reconcilable uses.

Artefact: Cultural object (made by humans).

Buffer Zone: Means an area surrounding a cultural heritage which has restrictions placed on its use or where collaborative projects and programs are undertaken to afford additional protection to the site.

Co-management: Managing in such a way as to consider the needs and desires of stakeholders, neighbours and partners, and incorporating these into decision making through, amongst others, the promulgation of a local board.

Conservation: In relation to heritage resources, includes protection, maintenance, preservation and sustainable use of places or objects to safeguard their cultural significance as defined. These processes include, but are not necessarily restricted to preservation, restoration, reconstruction and adaptation.

Contextual Paradigm: A scientific approach which places importance on the total context as catalyst for cultural change and which specifically studies the symbolic role of the individual and immediate historical context.

Cultural Resource: Any place or object of cultural significance

Cultural Significance: Means aesthetic, architectural, historical, scientific, social, spiritual, linguistic or technological value or significance of a place or object for past, present and future generations.

Feature: A coincidental find of movable cultural objects.

Grading: The South African heritage resource management system is based on a grading system, which provides for assigning the appropriate level of management responsibility to a heritage resource.

Heritage Resources Management: The utilization of management techniques to protect and develop cultural resources so that these become long term cultural heritage which are of value to the general public.

Heritage Resources Management Paradigm: A scientific approach based on the Contextual paradigm but placing the emphasis on the cultural importance of archaeological (and historical) sites for the community.

Heritage Site Management: The control of the elements that make up the physical and social environment of a site, its physical condition, land use, human visitors,

interpretation etc. Management may be aimed at preservation or, if necessary, at minimizing damage or destruction or at presentation of the site to the public.

Historic: Means significant in history, belonging to the past; of what is important or famous in the past.

Historical: Means belonging to the past or relating to the study of history.

Maintenance: Means the continuous protective care of the fabric, contents and setting of a place. It does not involve physical alteration.

Object: Artefact (cultural object)

Paradigm: Theories, laws, models, analogies, metaphors and the epistemological and methodological values used by researchers to solve a scientific problem.

Preservation: Refers to protecting and maintaining the fabric of a place in its existing state and retarding deterioration or change and may include stabilization where necessary. Preservation is appropriate where the existing state of the fabric itself constitutes evidence of specific cultural significance, or where insufficient evidence is available to allow other conservation processes to be carried out.

Protection: With reference to cultural heritage resources this includes the conservation, maintenance, preservation and sustainable utilization of places or objects in order to maintain the cultural significance thereof.

Place: Means a geographically defined area. It may include elements, objects, spaces and views. Place may have tangible and intangible dimensions.

Reconstruction: To bring a place or object as close as possible to a specific known state by using old and new materials.

Rehabilitation: The repairing and/ or changing of a structure without necessarily taking the historical correctness thereof into account.

Restoration: To bring a place or object back as close as possible to a known state, without using any new materials.

Site: A large place with extensive structures and related cultural objects. It can also be a large assemblage of cultural artefacts, found on a single location.

Sustainable: Means the use of such resource in a way and at a rate that would not lead to its long-term decline, would not decrease its historical integrity or cultural significance and would ensure its continued use to meet the needs and aspirations of present and future generations of people.

APPENDIX B: CHANCE FINDS PROCEDURE

What is a Chance Finds Procedure?

The purpose of Archaeological Chance Find Procedure (CFP) is to address the possibility of cultural heritage resources and archaeological deposits becoming exposed during ground altering activities within the project area and to provide protocols to follow in the case of a chance archaeological find to ensure that archaeological sites are documented and protected as required. A CFP is a tool for the protection of previously unidentified cultural heritage resources during construction and mining. The main purpose of a CFP is to raise awareness of all construction workers on site regarding the potential for accidental discovery of cultural heritage resources and establish a procedure for the protection of these resources.

Chance finds are defined as potential cultural heritage (or paleontological) objects, features, or sites that are identified outside of or after Heritage Impact studies, normally as a result of construction monitoring. Archaeological sites are protected by The National Heritage Resources Act of 1999. They are non-renewable, very susceptible to disturbance and are finite in number. Archaeological sites are an important resource that is protected for their historical, cultural, scientific and educational value to the general public, local communities.

What are the objectives of the CFP?

The objectives of this “Chance Find Procedure” are to promote preservation of archaeological data while minimizing disruption of construction scheduling. It is recommended that due to the moderate to high archaeological potential of some areas within the project area, all on site personnel and contractors be informed of the Archaeological Chance Find Procedure and have access to a copy while on site.

Where is a CFP applicable?

Developments that involve excavation, movement, or disturbance of soils have the potential to impact archaeological materials, if present. Activities such as road construction, land clearing, and excavation are all examples of activities that may adversely affect archaeological deposits. Chance finds may be made by any member of the project team who may not necessarily be an archaeologist or even visitors. Appropriate application of a CFP on development projects has led to discovery of cultural heritage resources that were not identified during archaeological and heritage impact assessments. As such, it is considered to be a valuable instrument when

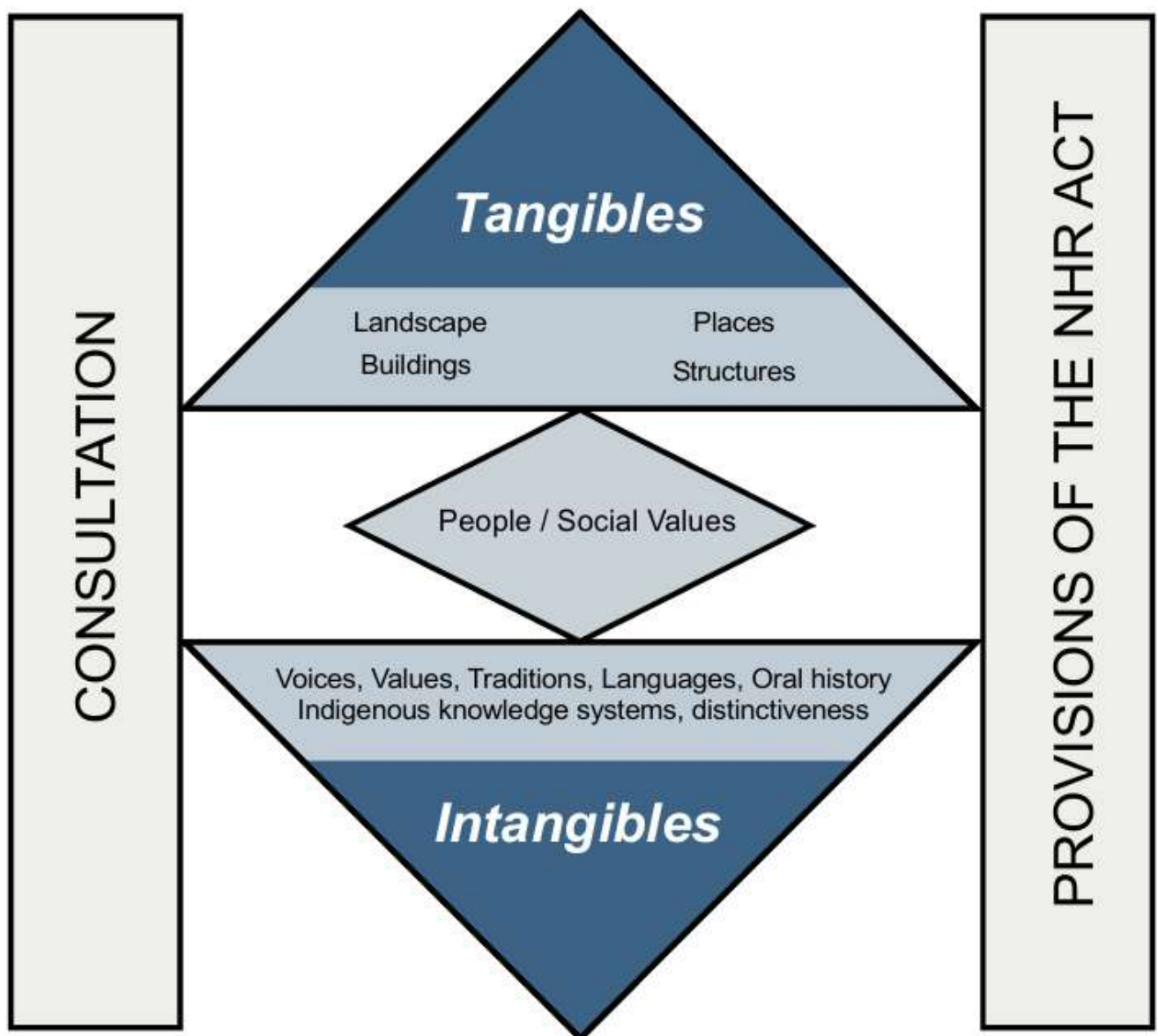
properly implemented. For the CFP to be effective, the construction manager must ensure that all personnel on the proposed construction site understand the CFP and the importance of adhering to it if cultural heritage resources are encountered. In addition, training or induction on cultural heritage resources that might potentially be found on site should be provided. In short, the Chance Find Procedure details the necessary steps to be taken if any culturally significant artefacts are found during mining or construction.

What is the CF Procedure?

The following procedure is to be executed in the event that archaeological material is discovered:

- All construction activity in the vicinity of the accidental find/feature/site must cease immediately to avoid further damage to the site.
- Briefly note the type of archaeological materials you think you've encountered, its location, and if possible, the depth below surface of the find.
- Report your discovery to your supervisor or if they are unavailable, report to the project Environmental Control Officer (ECO) who will provide further instructions.
- If the supervisor is not available, notify the ECO immediately. The ECO will then report the find to the Manager who will promptly notify the project archaeologist and SAHRA.
- Delineate the discovered find/ feature/ site and provide a 25m buffer zone from all sides of the find.
- An archaeologist should give recommendations on the cause of action to be taken.

APPENDIX C: THE CONCEPT OF HERITAGE MANAGEMENT



APPENDIX D: HERITAGE ASSESSMENT OF SIGNIFICANCE

The significance of a site can be modified or added to. Its importance can be increased by communicating the significance to more people through the media or archaeological reports. Site significance classification standards prescribed by SAHRA (2006), and acknowledged by ASAPA for the SADC region, were used for the purposes of this report. The main aim in assessing significance is to produce a succinct statement of significance, which summarises an item's heritage values. The statement is the basis for policies and management structures that will affect the item's future.

SAHRA's Site significance classification minimum standards			
Filed Rating	Grade	Classification	Recommendation
National Significance (NS)	Grade 1		Conservation; National Site nomination
Provincial Significance (PS)	Grade 2		Conservation; Provincial Site nomination
Local Significance (LS)	Grade 3A	High Significance	Conservation; Mitigation not advised
Local Significance (LS)	Grade 3B	High Significance	Mitigation (Part of site should be retained)
Generally Protected A (GP.A)		High/ Medium Significance	Mitigation before destruction
Generally Protected B (GP.B)		Medium Significance	Recording before destruction
Generally Protected C (GP.A)		Low Significance	Destruction

Site significance is calculated by combining the following concepts in the given formula.

$$S = (E + D + M) P$$

S = Significance weighting

E = Extent

D = Duration

M = Magnitude

P = Probability

The significance weightings for each potential impact are as follows:

The significance weightings for each potential impact are as follows:		
Aspect	Description	Weight
Probability	Improbable	1
	Probable	2
	Highly Probable	4
	Definite	5
Duration	Short term	1
	Medium term	3
	Long term	4
	Permanent	5
Scale	Local	1
	Site	2
	Regional	3
Magnitude/Severity	Low	2
	Medium	6
	High	8

GEOHYDROLOGICAL INVESTIGATION REPORT

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DMRE Ref No: KZN 30/5/1/1/2 12129 PR

NAME OF THE APPLICANT: MOLOBEDU MAKOWENI (PTY) LTD

PROSPECTING RIGHT APPLICATION FOR COAL ON FARM LOT 289 EMPANGENI 13389 GU, AND LOT 285 EMPANGENI 13400 GU, SITUATED IN KING CETSHWAYO DISTRICT, KWA-ZULU NATAL PROVINCE.

2026

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DOCUMENT TRACKING

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LIST OF ACRONYMS, ABBREVIATIONS AND DEFINITION

BA	Basic Assessment
CARA	The Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983)
cm	Centimeter
CMA	Catchment Management Agencies
CSIR	Council for Scientific and Industrial Research
DFFE	Department of Forestry, Fisheries and the Environment
DWS	Department of Water and Sanitation
EC	Electrical Conductivity (mS/m).
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
K	Hydraulic Conductivity.
MAE	Mean Annual Evaporation
m.a.m.s. l	Meters above mean sea level
m.b.g.l	Meters below ground level
TDS	Total Dissolved Solids (mg/l).
WMA	Water Management Area

1. BACKGROUND

Molobedu Makoweni (Pty) Ltd, hereafter referred to as 'the applicant' or Molobedu', has applied for a prospecting right for coal in respect of Lot 289 Empangeni 13389 GU, Lot 285 Empangeni 13400 GU, situated in King Cetshwayo district, Kwa-Zulu Natal Province, for an extent area of is 1,160 ha.

Vahlangwe Mining Advisory and Consulting, as the Molobedu' appointed lead consultant, appointed Rofhiwavhutali (Pty) Ltd to compile a basic geohydrological assessment as part of Specialist Studies required for the Project.

A basic geohydrological assessment is required to predict and quantify the potential impacts on water resources as well as to recommend reasonable mitigation measures. This assessment is fundamental to the discipline of environmental management and is a requirement of environmental impact assessments (EIA), water use license applications (WULA), Environmental Management Programmes (EMP) and other studies.

The assessment was undertaken in accordance with the National Environmental Management Act, 1998 (Act 107 of 1998) (as amended) and the National Water Act, 1998 (Act 36 of 1998), which collectively provide the framework for the protection, use, development, and management of South Africa's water resources. These Acts establish the legal basis for implementing tools and measures to safeguard water resources.

Additional legislation relevant to the Prospecting right, including Section 16 and the provisions for removal and disposal of minerals under Section 20 of the Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002) (as amended), has also been considered.

This report serves as a Geohydrological Investigation for the proposed Project.

1.1. Project Infrastructure Components

The Prospecting Right (PR) area applied for covers approximately 1,160 ha, and the applicant intends to use drill rigs to extract coal core logs. To undertake this mining activity, the following infrastructure is required, which includes:

- Administration mobile offices.
- Ablution facilities,
- Packing bay for machineries,
- Packing for staff and visitors
- Bunded walls to store chemicals like diesel or fuel.
- Waste bins
- Equipment such as the excavators, FELs, water takers, and dump trucks.
- Crushing and screening

1.2. Scope of work

The scope of work can be defined as follows:

- Desk study to study the geology and groundwater regime.

- Hydro-census of existing boreholes and surface water bodies in a radius around the planned development area.
- Collect information on existing threats to groundwater quality.
- Hydrogeological impact assessment for the site.
- Compilation of a hydrogeological study report which will contain the hydro-census information, geological description, groundwater flow directions, surface water bodies and boreholes.
- Groundwater monitoring network and monitoring programme for long term monitoring of the groundwater regime.

2. SITE DESCRIPTION

2.1. Site Locality

The proposed prospecting right area is located on Lot 289 Empangeni 13389 GU, Lot 285 Empangeni 13400 GU, situated in King Cetshwayo district, Kwa-Zulu Natal Province, for an extent area of is 1,160 ha. The prospecting area is situated 19 km North of Empangeni and 21 km West of Kwa Mbonambi town, using R34 access road Figure 2-1 and Figure 2-2.

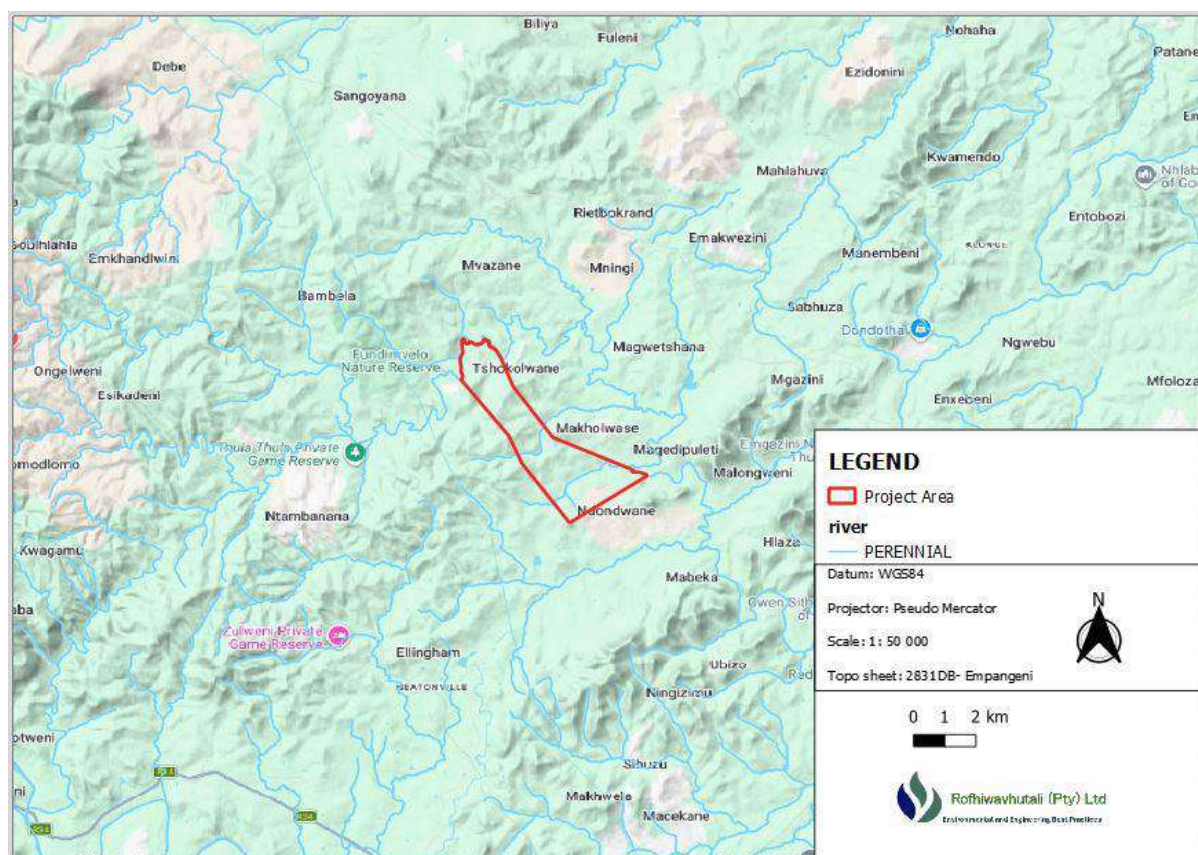


Figure 2-1: Locality Map of the site proposed for the development

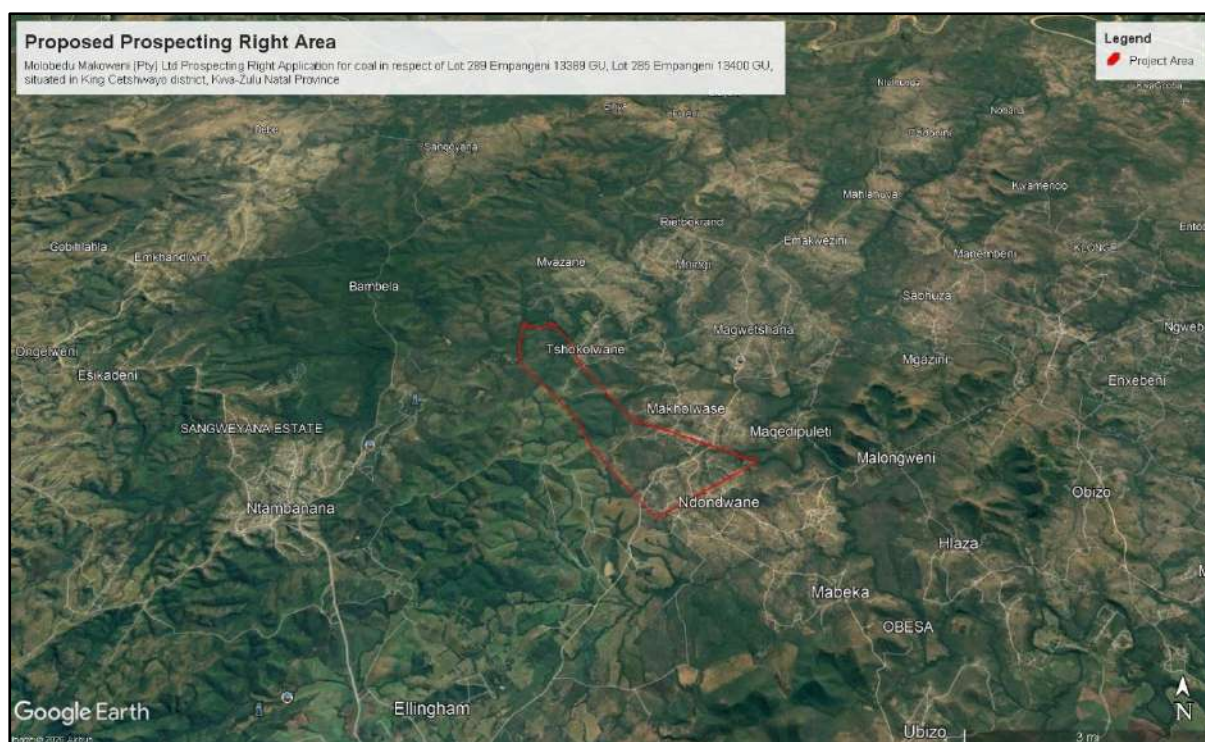


Figure 2-2: Google Earth view of the site proposed for the development

3. STUDY METHODOLOGY:

The methodological approach for the study consisted of the following:

- i. A comprehensive assessment of available reports, maps, and scientific literature was undertaken to understand the study area's geographic setting, climate, and geological framework.
- ii. A hydro-census was conducted following the desktop review to obtain information such as groundwater levels, borehole depths, and the status of existing boreholes within the vicinity of the proposed prospecting right area. The survey aimed to gather essential geohydrological data, including current groundwater use, water level depths, and borehole coordinates.
- iii. Relevant hydrological and topographic information was collected to define catchment characteristics.
- iv. Aquifer types, recharge zones, and groundwater flow properties were identified to inform the conceptual understanding of the groundwater system.
- v. Geohydrological investigation was undertaken to identify and evaluate potential impacts on groundwater and geological conditions associated with the proposed mining activities. Appropriate mitigation measures were proposed to reduce identified risks.
- vi. Recommendations and conclusions were formulated to guide the sustainable management of groundwater and geological resources during the lifecycle of the project.

3.1. Assumptions, limitations and gaps

The following assumptions, limitations and gaps were applicable for the basic Geohydrological Assessment Report:

- The desktop study was based on information obtained via literature, google maps, ArcGIS, Qgis which is assumed to be correct and of the latest information available;
- The study is based on field observations conducted in accessible areas, and where there was no access, it was supported by using desktop-derived information, including geological maps, satellite imagery, and regional groundwater datasets. It is assumed that the available published and database information is accurate and reasonably representative of site conditions, and that subsurface conditions between observed points are consistent with regional geological patterns.

4. DESKTOP STUDY

4.1. Climate

Climate is the state of the atmosphere over long periods, such as over years, decades, centuries, or greater, and the weather is defined as the atmospheric conditions of an area over a short period (Naomi, 2004).

4.1.1. Average temperature and precipitation

Average temperature and precipitation are shown Figure 4-1 and Figure 4-2. Figure 4-1 shows the temperature variations throughout the year are shown in where the solid red line represents the mean daily maximum temperature and the solid blue line indicates the mean daily minimum; the dashed red and blue lines reflect the historical extremes, highlighting the hottest days and coldest nights recorded over the past 30 years. To further illustrate temperature trends.

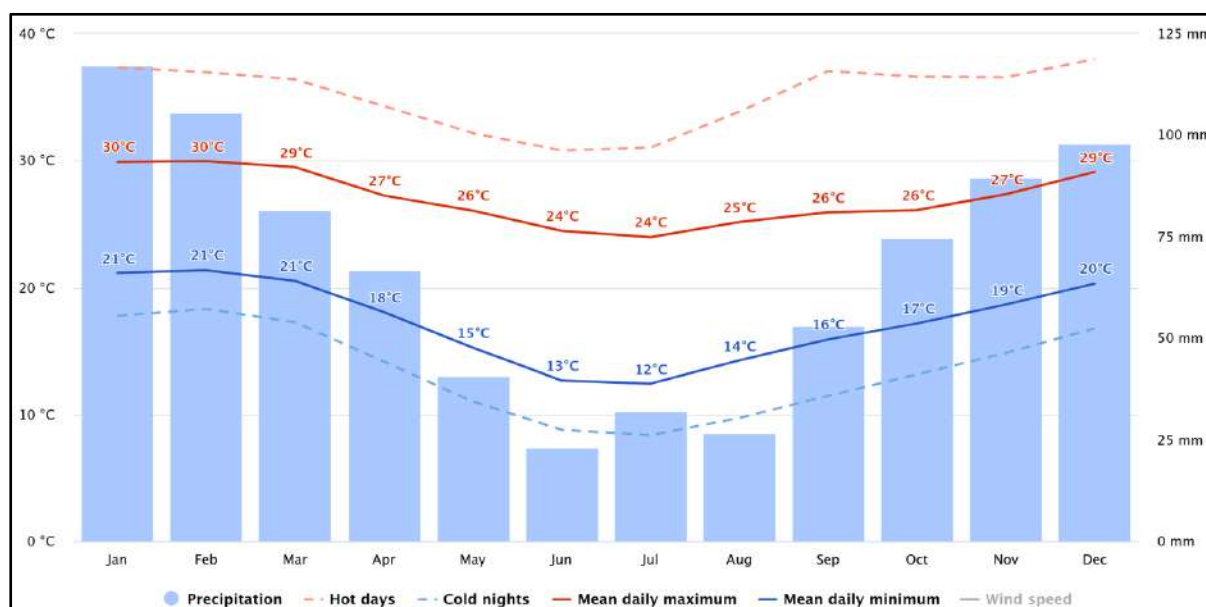


Figure 4-1: Average temperatures and Precipitation (meteoblue.com)

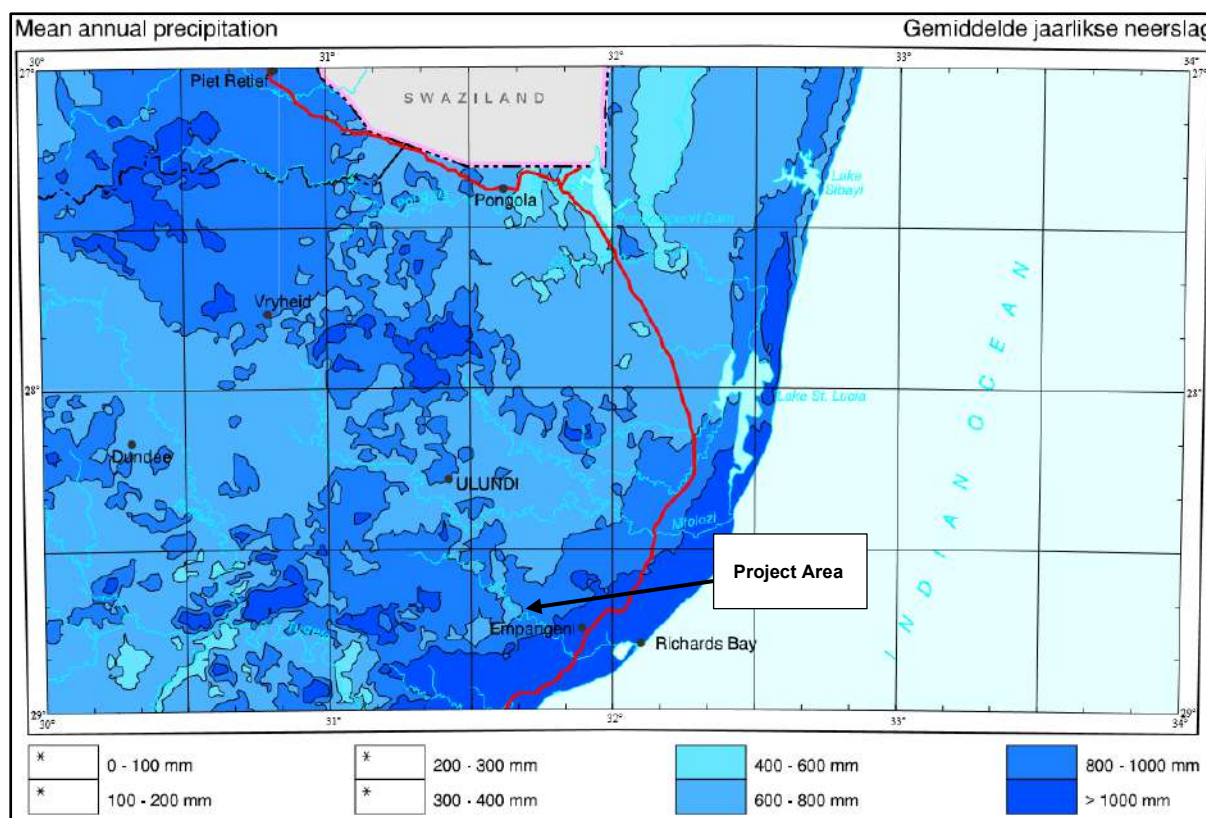


Figure 4-2: Mean Annual Precipitation

4.1.2. Wind Characteristics

The wind rose for the Project Area (Figure 4-3), shows how many hours per year the wind blows from the indicated direction per wind speed class the modelled data is an accurate representation of actual winds.

Wind blowing from the southwest (SW) toward the northeast (NE). Figure 4-4 shows the days per month, during which the wind reaches a certain speed. Wind speeds are generally highest during the spring months (August to October) and lowest during autumn and winter.

(Figure 4-3) presents the wind rose diagram for the area, depicting the frequency and direction of wind patterns throughout the year, for example, wind blowing from the southwest (SW) toward the northeast (NE).

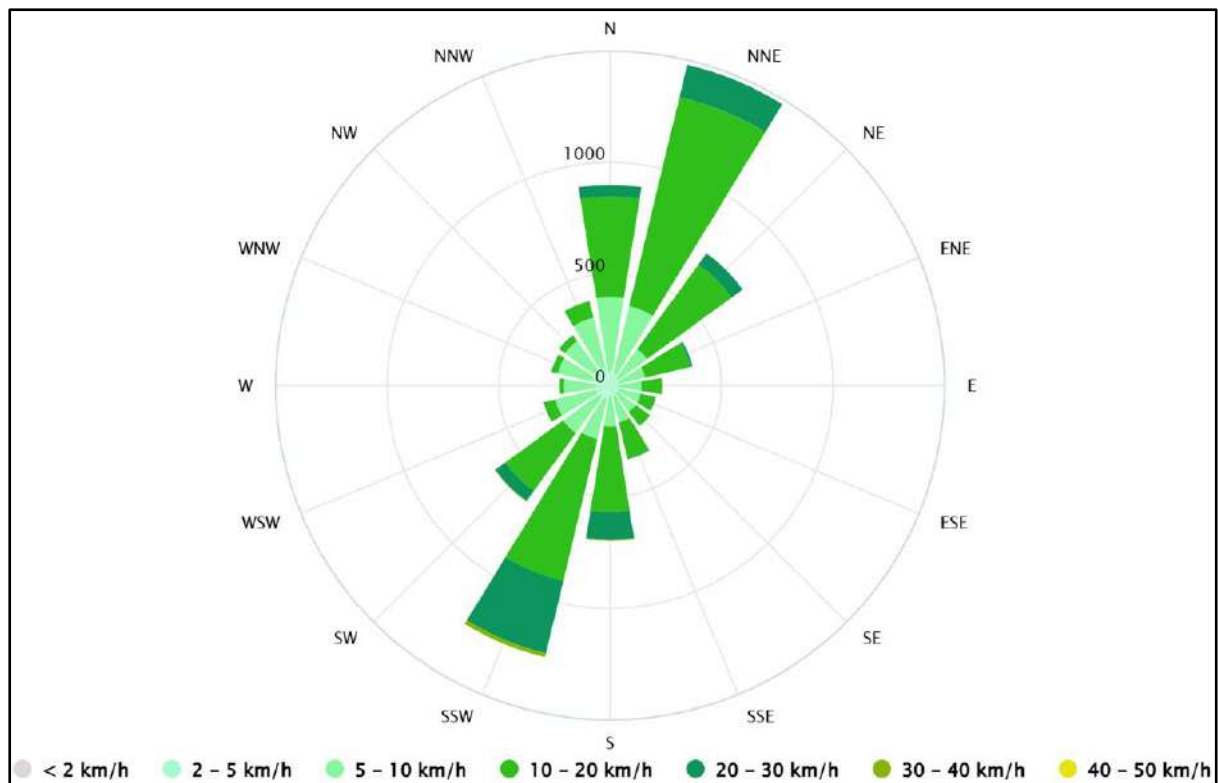


Figure 4-3: Wind rose (Meteoblue.com)

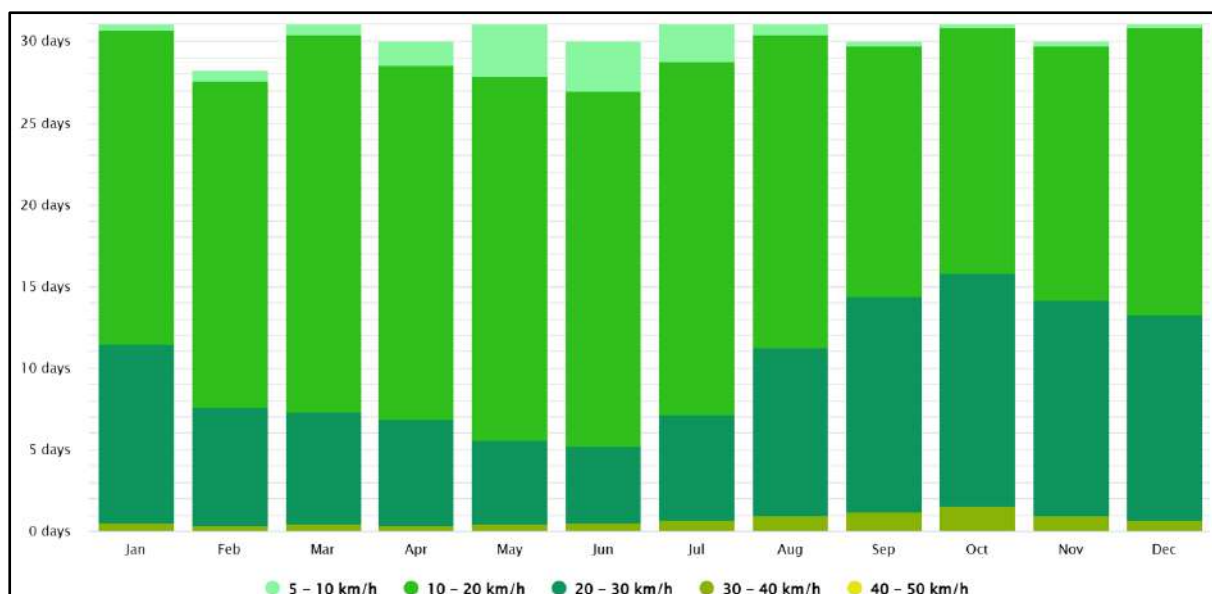


Figure 4-4: Wind speed Richards Bay (Meteoblue.com)

4.1.3. Topography and Drainage

Topography, especially variations in slope, plays a vital role in groundwater vulnerability by controlling the drainage and movement of water across the land surface. Slopes direct surface water flow, channeling it toward lower-lying areas or depressions, which influences whether contaminants are more likely to run off or infiltrate into the ground (Musekiwa & Majola, 2011). The topography is mainly flat and rolling but includes the escarpment itself. Altitude varies

from near sea level to 200 to 400 m above sea level, as illustrated in Figure 4-5 and Figure 4-6.

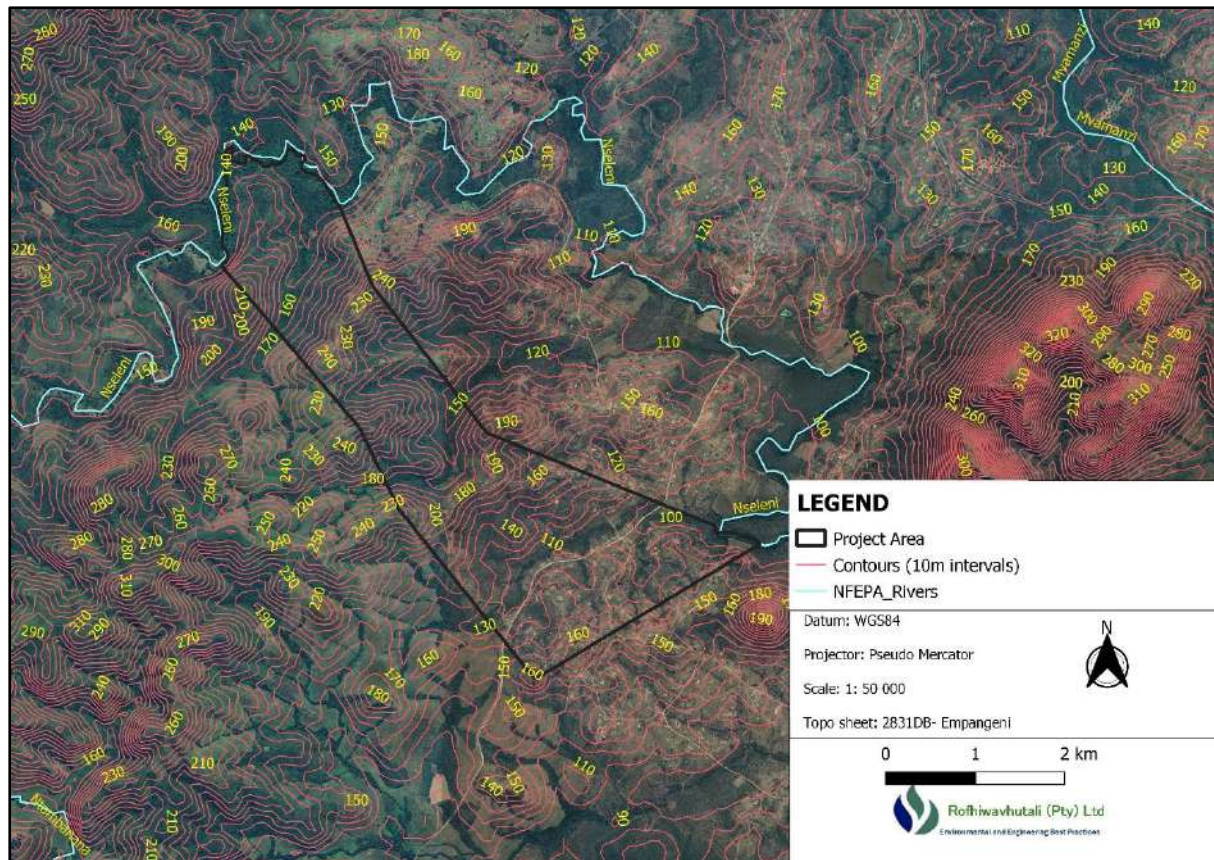


Figure 4-5: Elevation Map

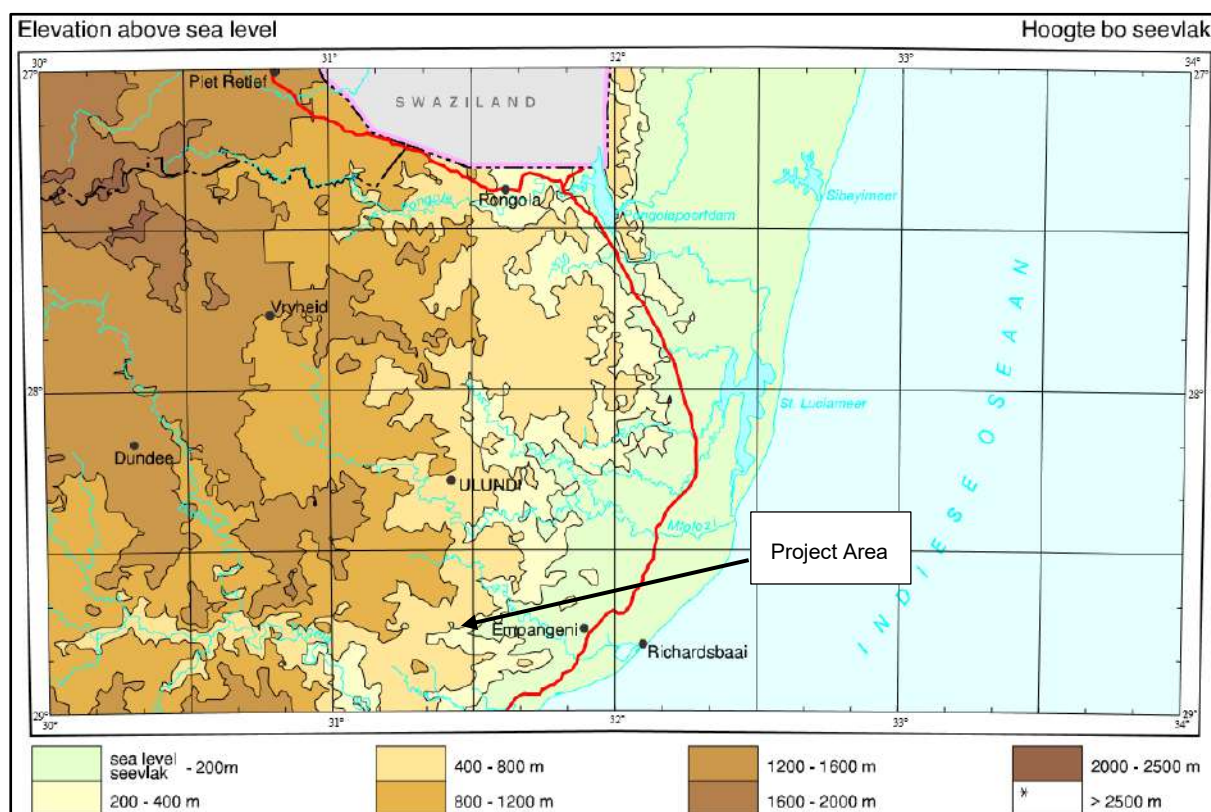


Figure 4-6: Elevation above level

5. CATCHMENT INFORMATION

The study area is located in the Pongola Mtamvuna water management area. In this water management area, the major rivers include the Pongola, Usutu, Mkuze, Mtamvuna, Mbizane and Mzimkulu river systems. the study area is also influenced by smaller coastal river system such as the Nseleni River. The quaternary catchment is W12G (Figure 5-1). The WR2012 study presents hydrological parameters for each quaternary catchment including area, mean annual precipitation (MAP) and mean annual runoff (MAR). Based on the WR2012 study, the project area falls within the quaternary catchment W12G. The catchment area information is shown on Table 5-1.

Table 5-1: WRS of 2012, Water Management Area, MAP and QC

Water Management Area (WMA or primary catchment W)	MAE	Quaternary Catchment	Area of the quaternary catchment (KM2)	MAP (mm)	Evaporation Zone	MAR (WR2012)
Pongola Mtamvuna	1350	W12G	326	835	22A	29.18

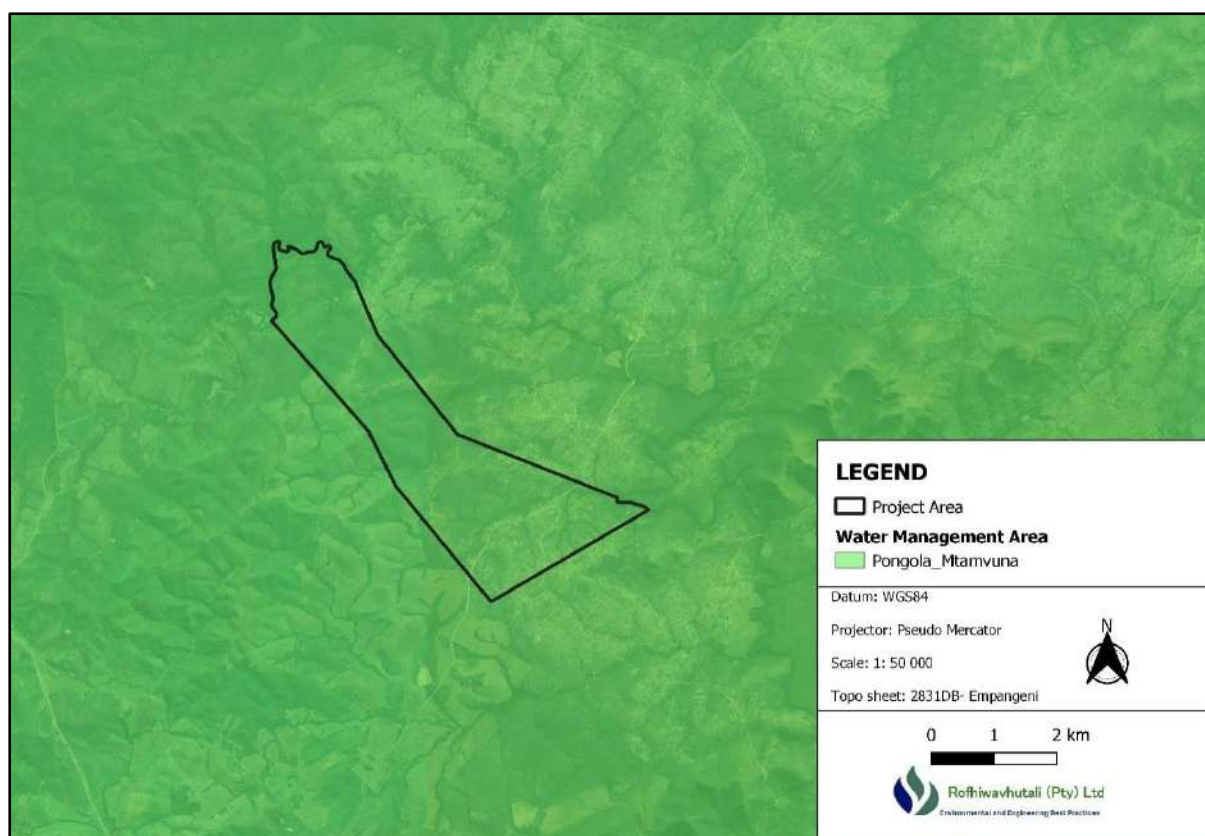


Figure 5-1: Water Management Area (WMA)

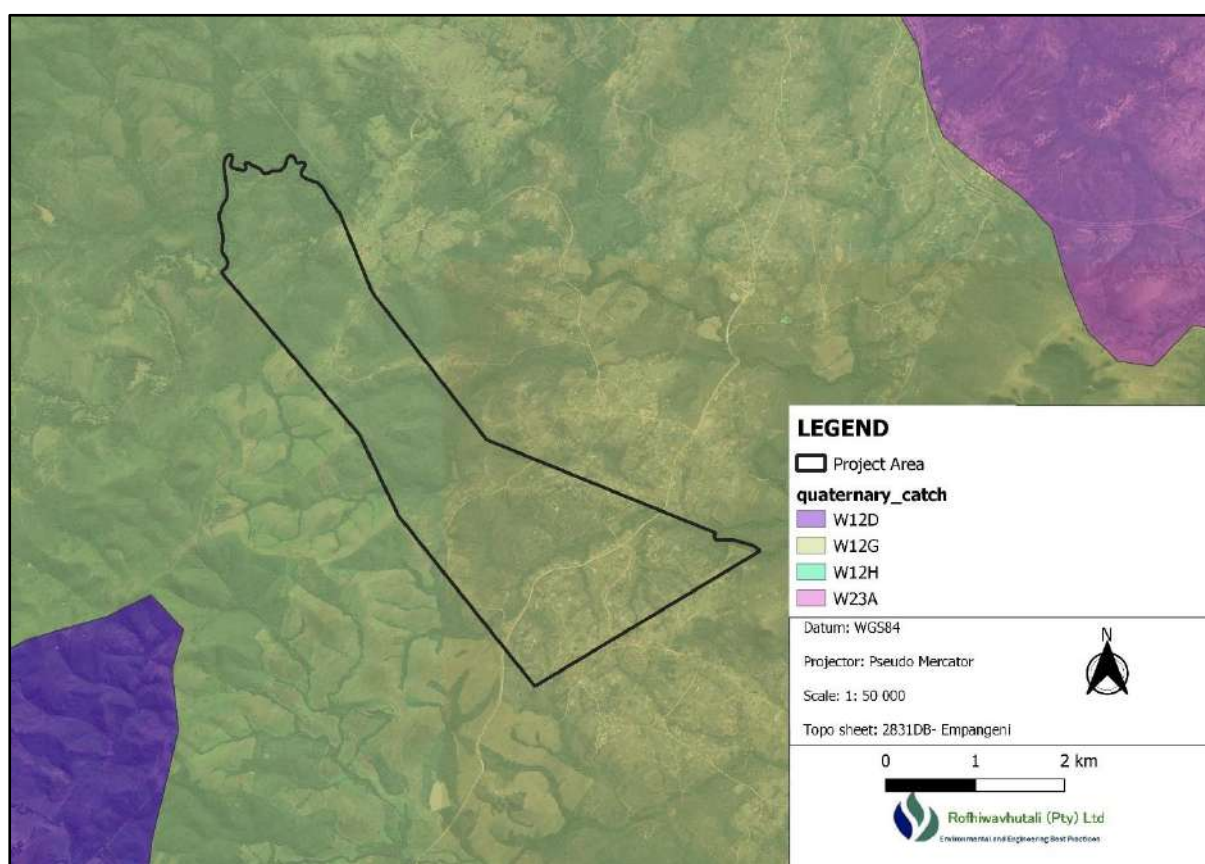


Figure 5-2: Quaternary Catchment

6. AQUIFER CHARACTERIZATION

6.1. Groundwater vulnerability

Groundwater vulnerability is described as a relative, non-measurable property, according to the International Association of Hydrogeologists (IAH, 1994), based on the notion that certain land areas are more susceptible to groundwater contamination (Vrba and Zaporozec, 1994).

Figure 6-1 indicates the tendency or likelihood for contamination to reach a specified position in the groundwater system after introduction at some location above the uppermost aquifer. The aquifer vulnerability from possible pollution sources is classed as “Moderate” as shown on Figure 6-1. Yellow represents the moderately vulnerable region which is vulnerable to some pollutants, but only when continuously discharged or leached (Vegter, JR; Seymour, AJ, 2013).

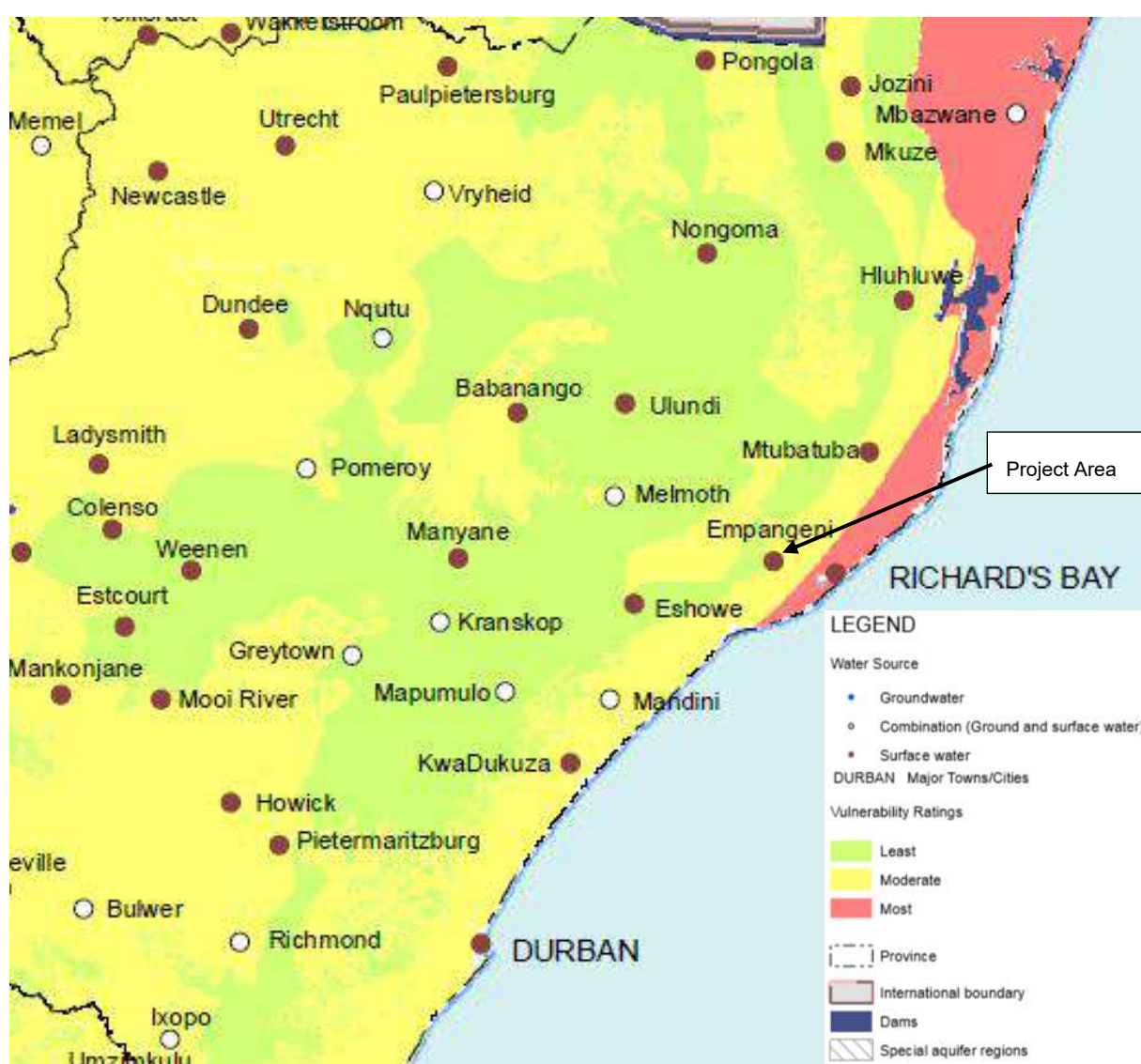


Figure 6-1: Aquifer Vulnerability of the study area.

6.2. Aquifer classification

The (Figure 6-2) below illustrates aquifer classification of different areas in South Africa. It can be deduced that the project area comprises of minor aquifers, and the dominant water source is surface water (Vegter & Seymour, 2012). (Table 6-1) interprets the meaning of the aquifer classification and when an area is said to have minor aquifer, it means that the aquifer is a moderately yielding aquifer with acceptable quality or high yielding aquifer of poor-quality water.

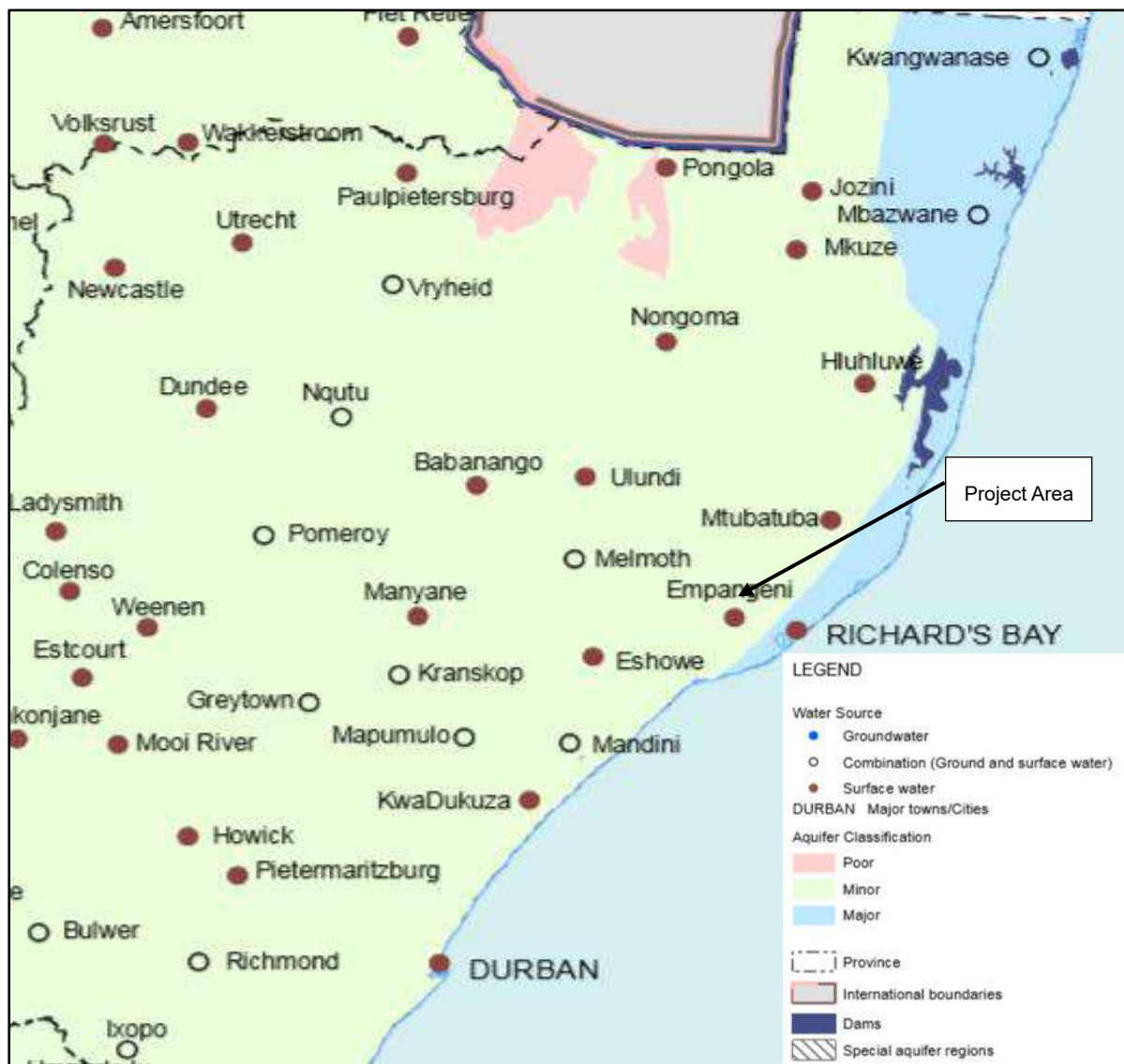


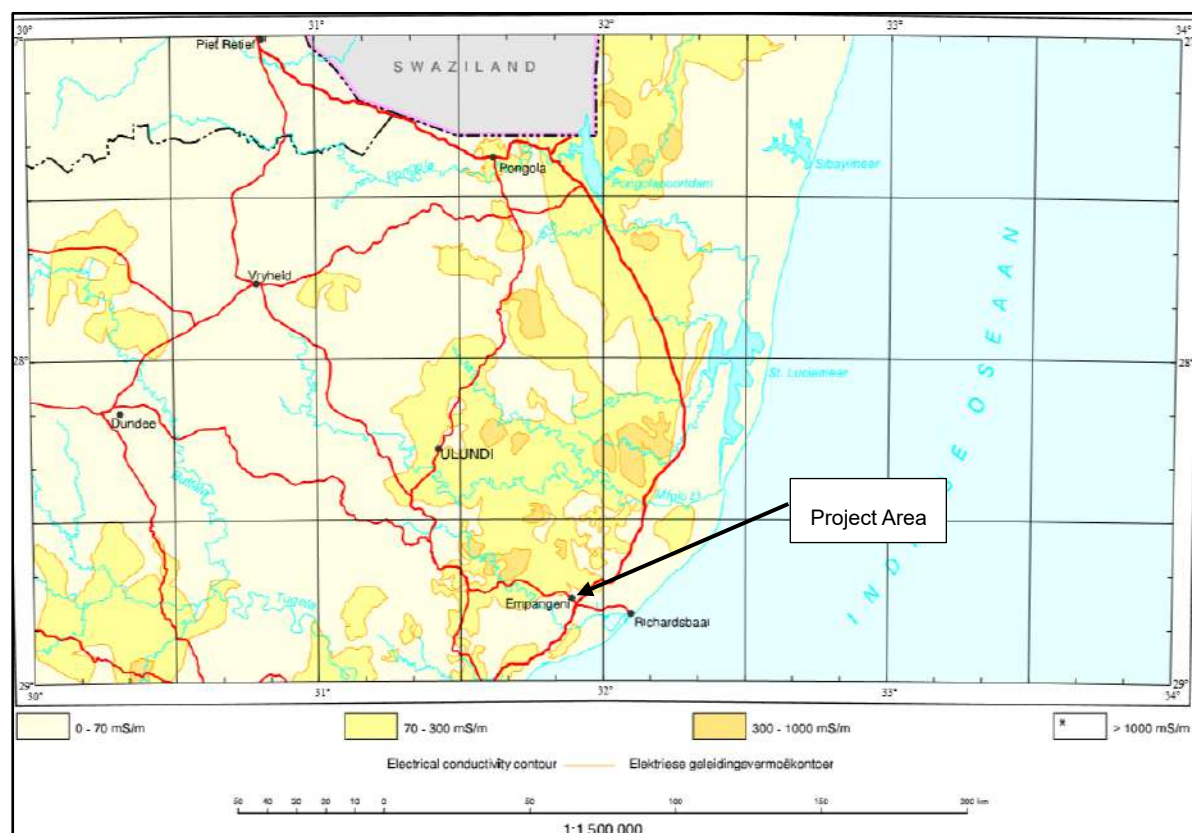
Figure 6-2: Aquifer Classification

Table 6-1: Aquifer characterization

Sole source aquifer	An aquifer used to supply 50% or more of urban domestic water for a given area, for which there are no reasonably available alternative sources should this aquifer be impacted upon or depleted.
Major aquifer region	High-yielding aquifer of acceptable quality water.
Minor aquifer region	Moderately yielding aquifer of acceptable quality or high yielding aquifer of poor-quality water.
Poor aquifer region	Insignificantly yielding aquifer of good quality or moderately yielding aquifer of poor quality, or aquifer that will never be utilised for water supply and that will not contaminate other aquifers.

6.3. Hydraulic conductivity of the aquifer

Hydraulic conductivity reflects an aquifer's capacity to transmit water under a hydraulic gradient. It directly influences the rate at which groundwater and any dissolved contaminants move, meaning that higher hydraulic conductivity typically leads to increased vulnerability to contamination (Musekiwa & Majola, 2011). The water quality and electrical conductivity maps of the project area are shown on Figure 6-3 and Figure 6-4.

**Figure 6-3: Groundwater quality Map**

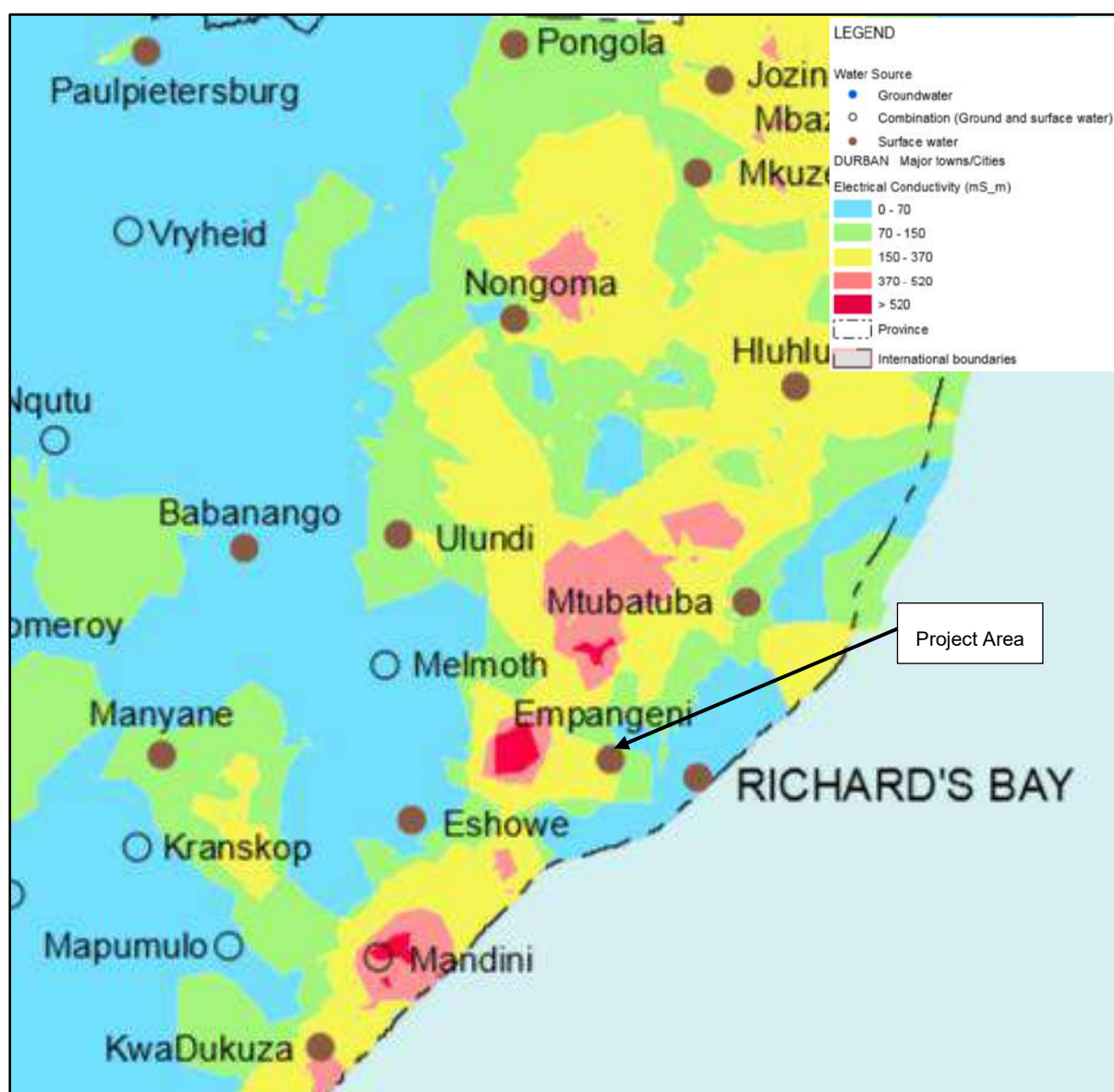


Figure 6-4: Electrical Conductivity (mS_m)

6.4. Aquifer Susceptibility

Aquifer susceptibility means the simplicity with which contaminants can move from the land surface to the aquifer based exclusively on the types of surface and subsurface materials in the area. This usually defines the rate at which a contaminant will reach an aquifer unimpeded by chemical interactions with the vadose zone media. The method of aquifer susceptibility analysis has been used to objectively evaluate the spatial correlation between the high presence of pollutants in each aquifer and land use factors that can potentially influence the contamination. Moreover, the results allowed us to quantify on a large scale the effect that preferential flow paths, due to both thickness variation in the aquitard and the areal density of multi aquifer wells, have in reducing the protection of the underlying deep aquifer.

Table 6-2 and Figure 6-5 indicates the qualitative measure of the relative ease with which a groundwater body can be potentially contaminated by anthropogenic activities and includes both aquifer vulnerability and the relative importance of the aquifer in terms of its classification.

Table 6-2: Susceptibility Matrix

AQUIFER CLASSIFICATION				
VULNERABILITY		Poor	Minor	Major
	Least	Low 1	Low 2	Medium 3
	Moderate	Low 2	Medium 4	High 6
		Medium 3	High 6	High 9



Figure 6-5: Susceptibility Map

7. GEOLOGY

7.1. Regional Geology

The project area is underlain predominantly by the Emakwezini Formation and intrusions of the Karoo Dolerite Suite. The Beaufort Group in the region is represented by the Emakwezini, Ntabeni, Nyoko and Clarens Formations, which are reported to be of Triassic to Late Jurassic age (King, 1997). The Emakwezini Formation conformably overlies the Volksrust Formation of the Ecca Group and comprises approximately 500 m of shales and fine-grained sandstones, with subordinate siltstones. The sandstones are generally well-bedded and feldspathic in composition. Thin coal seams occur intermittently throughout the Emakwezini Formation (King, 1997). Karoo-aged dolerite intrusions occur in the form of dykes and sills that intruded the older sedimentary rock units. Dolerite dykes, typically ranging in width from 1 m to 8 m, are common within the Karoo Supergroup. Most dykes exhibit a vertical or near-vertical dip, although in the eastern portion of the area they display a westward dip associated with regional structural controls (King, 2003). Intrusive dolerite sills vary in thickness from approximately 1 m to more than 50 m and occur frequently within the Ecca Group strata. Figure 7-1 below depicts the geology associated with the project area.

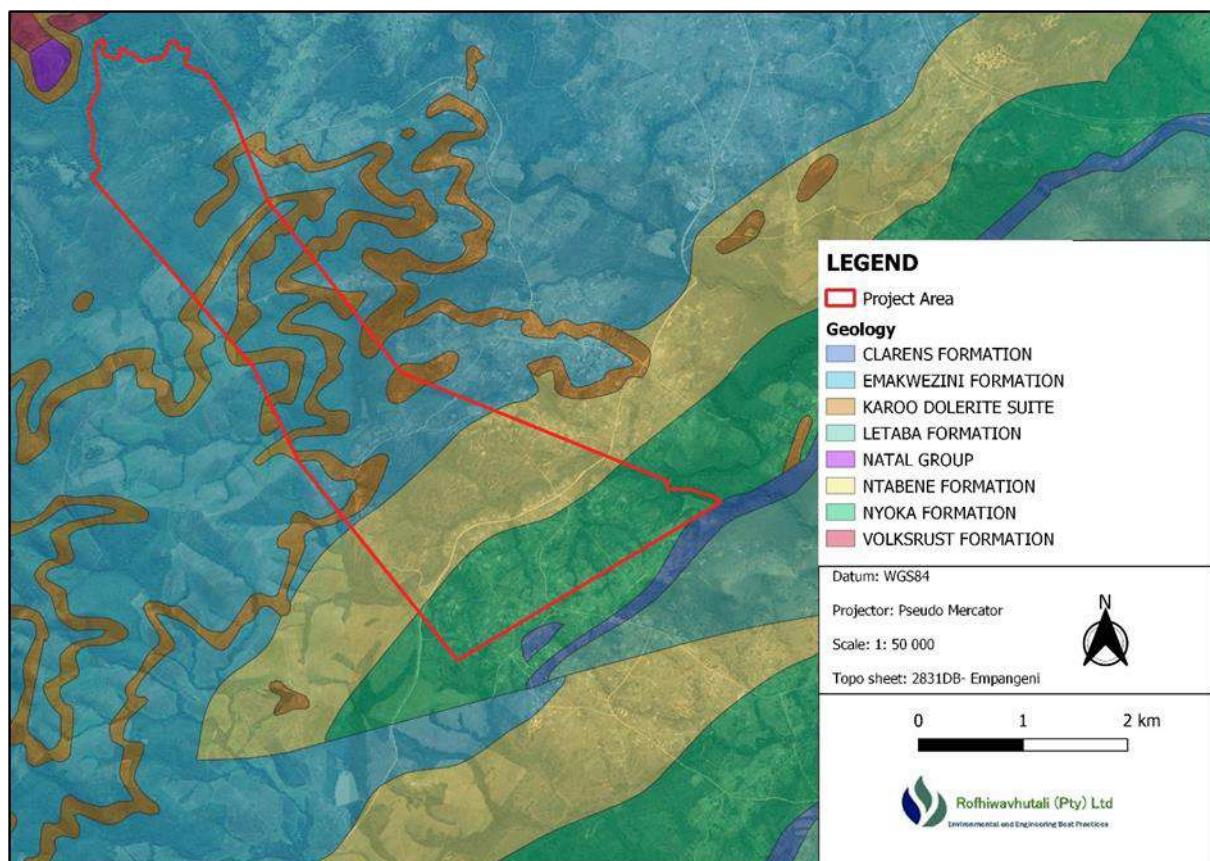


Figure 7-1: Geology Associated with the Project Area

8. GEOHYDROLOGY

8.1. General groundwater understanding

Groundwater refers to the water located within the saturation zone, which lies beneath the unsaturated (aeration) zone. The unsaturated zone functions like a sponge, permitting water to seep down into the saturation zone (Kruseman & de Ridder, 1991). These two zones are separated by the water table, as illustrated in Figure 8-1.

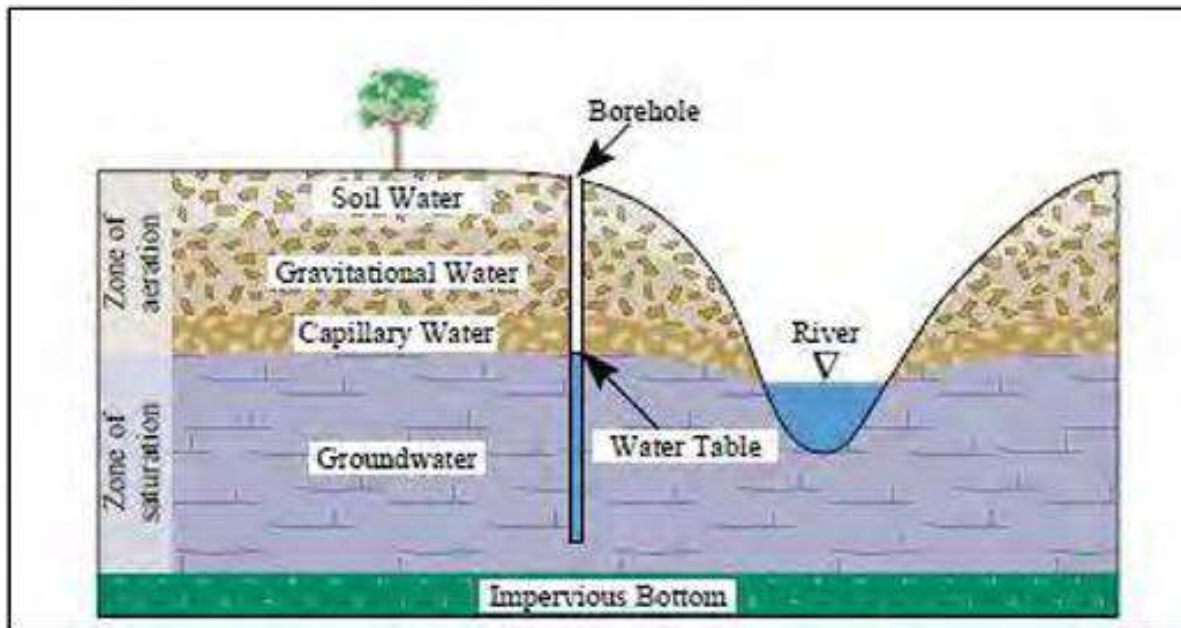


Figure 8-1: The basic concept of groundwater (Kruseman & de Ridder, 1991)

An aquifer is defined as a geological formation that holds sufficient water to be utilized for economically viable purposes, such as domestic use (van Tonder et al., 2001). There are two primary types of aquifers, as depicted in Figure 8-2: porous shallow weathered aquifers and deep fractured rock aquifers. Porous shallow weathered aquifers are composed of loosely packed grain materials like sand, gravel, and silt, while fractured rock aquifers consist of geological structures where groundwater flows through fractures, joints, and other breaks in the rock (Kruseman & de Ridder, 1991). It is crucial to recognize the strong relationship between geology and groundwater, as geological characteristics directly influence groundwater flow (van Tonder et al., 2001).

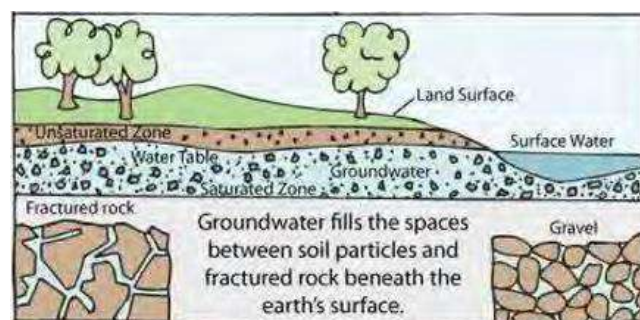


Figure 8-2: The basic Concept of Aquifers

8.2. Regional Geohydrology and Conceptual Groundwater flow

The type of aquifer plays an important role in groundwater vulnerability and availability, as these characteristics are largely controlled by the geohydrological composition of the aquifer materials. Aquifers developed in unconsolidated and semi-consolidated sediments typically exhibit primary (intergranular) porosity and are generally more susceptible to contamination than fractured bedrock aquifers. According to the 1:500 000 scale hydrogeological map series (Vryheid, Map Sheet 2730) and available hydrogeological information, groundwater in the project Area occurs predominantly within an intergranular primary aquifer hosted by semi-consolidated and unconsolidated sediments of Tertiary and Quaternary age as seen in Figure 8-3. These aquifers are associated with either loose and unconsolidated formations such as sands and gravels or with rock that has weathered to only partially consolidated material. The median borehole yields associated with the intergranular type aquifer has a yield between 0.5-2.0l/s. This aquifer type is characterised as a low to medium yielding 'Minor' aquifer in terms of the South African Aquifer Classification System. The saturated zone encompasses the section below the water table. The saturation within the intergranular aquifer is high relating to porosity of the overburden compared to the fractured aquifer. Within the fractured secondary aquifer, water saturation is limited to the fractures.

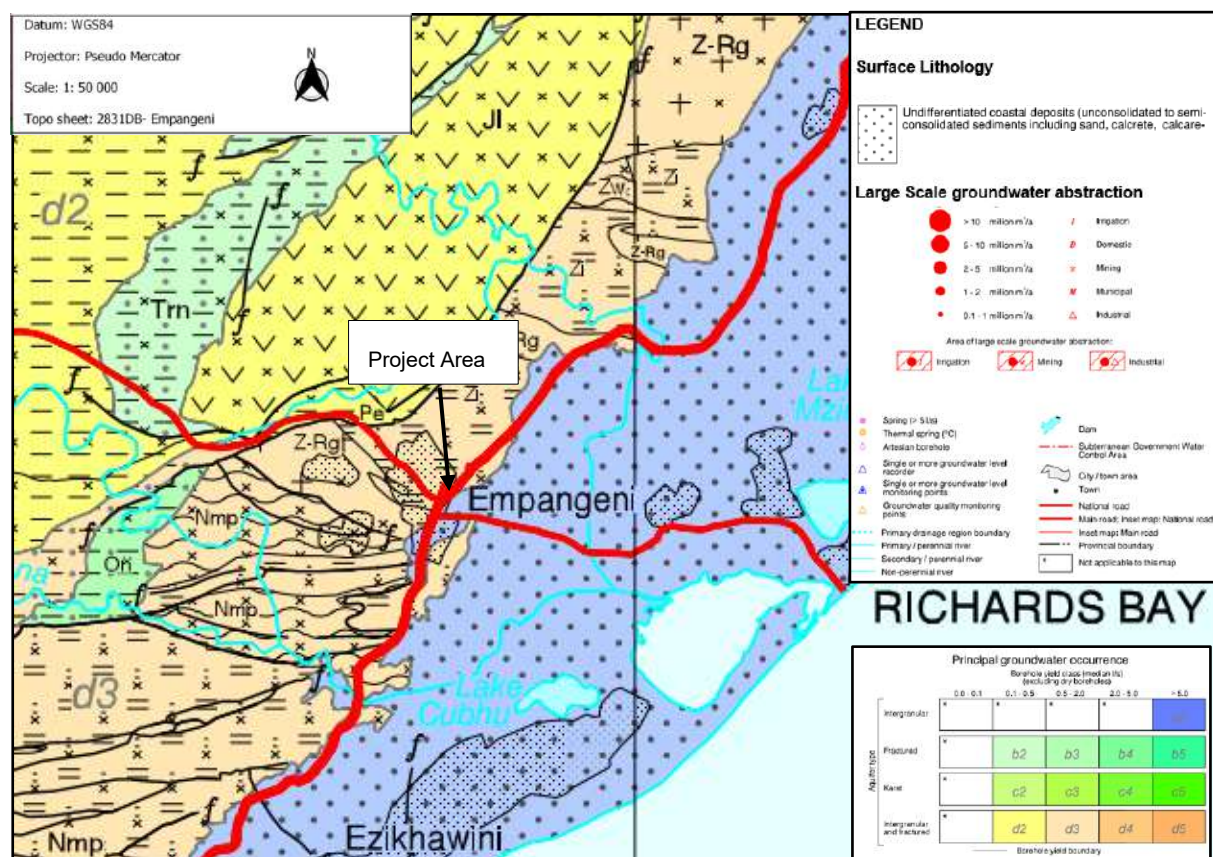


Figure 8-3: Geohydrological map, indicating the Geohydrology in the vicinity of the study area (Barnard, 1999).

9. GROUNDWATER INVESTIGATION AND FIELD WORK

9.1. Hydrocensus

9.1.1. Background

The Hydrocensus main objective is to record the groundwater data available i.e., counting the number of boreholes if present, recording their names, conditions, coordinates as well as measuring the water levels. This helps to identify the baseline groundwater use and users within the study area. On the 6th February 2026, a hydrocensus was conducted in accessible parts in and around the prospecting right area.

A hydrocensus aims to:

- Identify details of water-related features (e.g. storm water channels, erosion gullies, weirs, diversion embankments), and disused or abandoned boreholes and wells.
- Identify features where water could collect in rainy periods (quarries, borrow pits, seasonal puddles, etc.).
- Identify potential sources of contamination (latrines, waste disposal sites, animal kraals, defecation sites, animal watering points, soak-away pits and drains, etc.).
- Identify visible features (e.g. borehole casing rusted away at the surface, presence of algal blooms in stagnant water) that indicate the potential for water contamination.
- Identify water sources and, where possible, indicate the flow rate and the quality.

The primary goal of the hydrocensus survey is to document the utilization of groundwater within the region. This involves visiting local farmers and villages to identify any operational boreholes they may have, potentially serving as water sources. During this process, we will assess temperature, pH levels, conductivity (EC), dissolved oxygen (DO), and collect water samples. Prior to commencing the site hydrocensus, we acquire borehole data from the National Groundwater Archive (NGA) of the Department of Water and Sanitation. Figure 9-1 shows the location for existing boreholes around and inside the project area. The Geohydrological data shown in Table 9-1 was obtained during hydrocensus survey, with existing onsite boreholes, including the data obtained from NGA database located within 5km radius from the site are included.

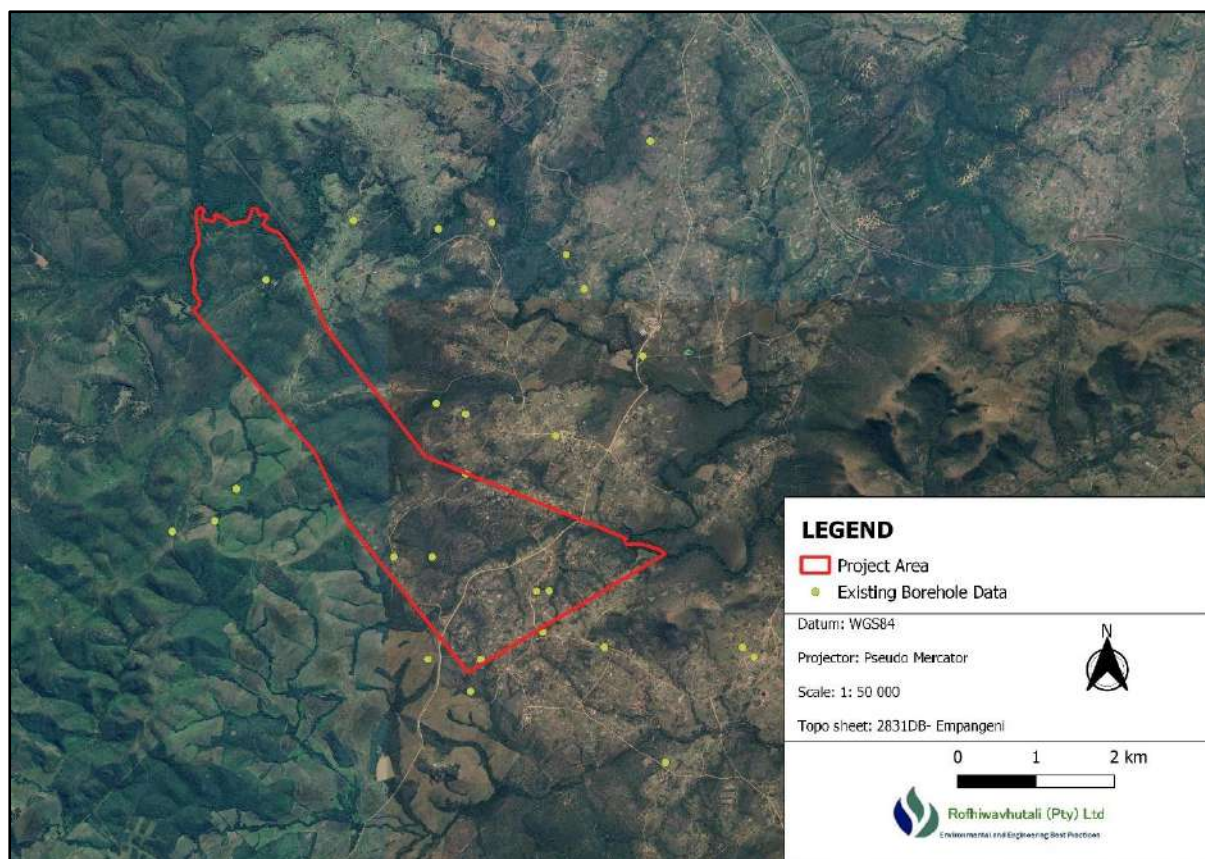


Figure 9-1: A map showing the existing boreholes

Table 9-1: Data obtained from hydrocensus data and NGA

Latitude	Longitude	Water Level	Discharge Rate	EC	pH	Water strike Depth To Top	Lithology	Formation Type
-28.606	31.82478	5.33	N/A	3735	7.8	29	Shale & sandstone	Sedimentary
-28.6057	31.86731	6.3	N/A	N/A	N/A	51	Shale	Sedimentary
-28.6045	31.86582	N/A	0.250 l/s	N/A	N/A	N/A	N/A	N/A
-28.5991	31.76588	51.82	0.850 l/s	N/A	N/A	65.53	Shale	Sedimentary
-28.5971	31.83894	N/A	N/A	N/A	N/A	N/A	Shale & sandstone	Sedimentary
-28.5971	31.8406	14.05	N/A	264	8.1	N/A	Shale & sandstone	Sedimentary
-28.5927	31.82033	13.32	0.400 l/s	237	8	62	Dolerite	Igneous
-28.5894	31.79144	N/A	N/A	N/A	N/A	N/A	N/A	N/A
-28.5838	31.79977	N/A	N/A	N/A	N/A	N/A	Shale	Sedimentary
-28.5838	31.79978	18.29	0.160 l/s	N/A	N/A	36.58	Shale	Sedimentary
-28.5819	31.82977	3.35	0.270 l/s	237	7.7	24	Sandstone	Sedimentary
-28.5577	31.84517	17.3	0.730 l/s	743	8.3	31	Sandstone	Sedimentary
-28.5577	31.84517	17.3	0.730 l/s	743	8.3	41	Dolerite	Igneous
-28.5565	31.80365	7.51	0.460 l/s	N/A	N/A	N/A	N/A	N/A
-28.5532	31.84283	N/A	N/A	N/A	N/A	N/A	Sandstone	Sedimentary
-28.5499	31.82616	N/A	N/A	N/A	N/A	N/A	N/A	N/A
-28.5491	31.83311	22.96	0.400 l/s	760	8	40	Shale	Sedimentary
-28.5488	31.81505	11	N/A	449	8.2	40	Dolerite	Igneous

9.1.2. Surface water sample

The surface water sample was analyzed in the field. The pictures and parameters assessed are presented in Table 9-2.

Table 9-2: Field Hydrocensus Measurement Parameters

SAMPLE ID	Latitude	Longitude	PH	TDS (mg/L)	EC (µs/cm)	DO (mg/L)	Temperature (oC)
Waterbody	-28.600716°	31.827357°	7.88	475	678	2.87	27.9



10. CONTAMINATION RISK ASSESSMENT

10.1. Parson's rating system

The "Parsons Rating System" is an aquifer classification system developed to implement a strategy for managing groundwater quality in South Africa. Classification, vulnerability and susceptibility are rated for a specific aquifer to be studied.

i. Aquifer Classification

The aquifer at the Proposed Prospecting Right site is classed as a minor aquifer in a minor aquifer region and can be described as a low to moderately yielding aquifer system of variable water quality.

ii. Aquifer vulnerability

A moderate tendency or likelihood does exist for contamination to reach a specific position in the groundwater system after introduction at some location above the uppermost aquifer.

iii. Aquifer susceptibility

The aquifer is rated to have a medium susceptibility. Susceptibility is a qualitative measure of the relative ease with which a groundwater body can be potentially contaminated by anthropogenic activities and includes both aquifer vulnerability and the relative importance of the aquifer in terms of its classification.

The Groundwater Quality Management Index (GQM index) of this option is rated at 4, and level of protection is shown in Table 10-1, to adhere to the Department of Water Affairs (DWA) water quality objectives.

Table 10-1: Appropriate Level of Groundwater Protection Required

GQM	Level of Protection
<1	Limited Protection
1-3	Low Level Protection
3-6	Medium Level Protection
6-10	High Level Protection
>10	Strictly non-degradation

10.2. Assessment of the vulnerability of the underground water resources

The vulnerability of the underground water sources is related to the distance that the contaminant must flow to reach the water table and the ease with which it can flow through the soil and rock layers above the water table. An assessment of the soil and rock types and the distance to the water table can be used to obtain a vulnerability class. (Groundwater Protocol document, Version 2, dated March 2003). Five broad classes of aquifer vulnerability are defined in Table 10-2 below.

Table 10-2: Vulnerability of groundwater Aquifer due to hydrological Conditions

Vulnerability Class	Measurements	Definition
Extreme (Usually highly fractured rock and/or high groundwater table)	High risk and short distance(<2m) to water table	Vulnerable to most pollutants with relatively rapid impact from most contamination disposed of at or close to the surface
High (usually gravely or fractured rock, and/or high water table)	High risk and medium distance(2-5m) to water table	Vulnerable to many pollutants except those highly absorbed, filtered and/or readily transformed
Medium (usually fine sand, deep loam soils with semi-solid rock and average water table > 10m)	Low risk and medium to long distance to water table	Vulnerable to inorganic pollutants but with negligible risk of organic or microbiological contaminants
Low (usually clay or loam soils with semi- solid rock and deep water table>20m)	Minimal and low risk and long to very long distance to water table	Only vulnerable to the most persistent pollutants in the very long term
Negligible (usually dense clay and/or solid impervious rock with deep water table)	Minimal risk with confining layers	Confined beds present with no significant infiltration from surface areas above aquifer.

In Table 10-2 above, according to the Groundwater Protocol document, Version 2, dated March 2003 in Table A, the vulnerability of the Groundwater Aquifer due to the Hydrogeological Conditions at the proposed Prospecting Right site can be rated as **medium** risk.

Table 10-3 below show that the surface material layer that is found on site have a medium capacity to absorb contaminants and a high capacity to create an effective barrier to contaminants. A high reduction of bacteria and viruses will be evident in the unsaturated aquifer if a sanitation leak does happen. Nitrates and phosphates will have some reduction and chloride will be minimally reduced. A minimal reduction of hydrocarbons is expected.

Table 10-3: Assessment of the reduction of contaminants in the unsaturated zone

Unsaturated Zone Conditions	Factor Effecting Reduction			Contamination Reduction			Comments
	Rate of flow in unsaturated zone	Capacity of the media to absorb contaminants	Capacity to create an effective barrier to contaminants	Bacteria and Viruses	Nitrates and Phosphates	Chlorides	
Clay	Very slow <10mm/d	High	High	Very high reduction	High Reduction	High Reduction	Very Good barrier to movement of contaminants. May have problems with water retention in pit
Silt	Slow 10-100mm/d	Medium	High	High Reduction	Some Reduction	Minimal Reduction	Good barrier to movement of biological contaminants, but little reduction in chemical contaminants.
Sandy loam	Slow 10-100mm/d	Medium	High	High Reduction	Some Reduction	Minimal Reduction	Good barrier to movement of biological contaminants, but little reduction in chemical contaminants.
Fractured or weathered sandstone	Medium 0.1 - 10m/d	Medium	Medium	High Reduction	Minimal Reduction	Minimal Reduction	Fair barrier to movement of biological contaminants, but little reduction in chemical contaminants.
Fine sand	Medium 0.1 - 10m/d	Minimal	High	High Reduction	Minimal Reduction	Minimal Reduction	Good barrier to movement of biological contaminants, but little reduction in chemical contaminants.

10.3. Common Pathways

The proposed Project Area is situated within an intergranular primary aquifer, which is generally unconfined to semi-confined in nature. Groundwater occurs and moves predominantly through pore spaces between sediment grains within semi-consolidated to unconsolidated materials. As a result, groundwater flow is mainly controlled by the permeability and porosity of the sediments, as well as local hydraulic gradients.

Water provides the primary mechanism for transporting contaminants away from their source. In an intergranular aquifer system, particle pores and interconnected voids within the sediments form the main pathways that allow contaminants to migrate within the subsurface.

The rate and extent of contaminant movement are therefore governed by sediment texture, degree of compaction, and groundwater recharge conditions.

The following common pathways have been identified:

- Percolation of contaminants through soil media; and
- Direct contact with groundwater. Groundwater will be the transport medium for downstream migration of contaminants (migration rate will depend on the natural groundwater flow rate).

10.3.1. Potential Receptors

Receptors can be classified as points of discharge such as boreholes used for water drinking, rivers, or streams where animal (including humans) and plants come into contact or consume contaminated water. Surface water features are illustrated in Figure 10-1 below.

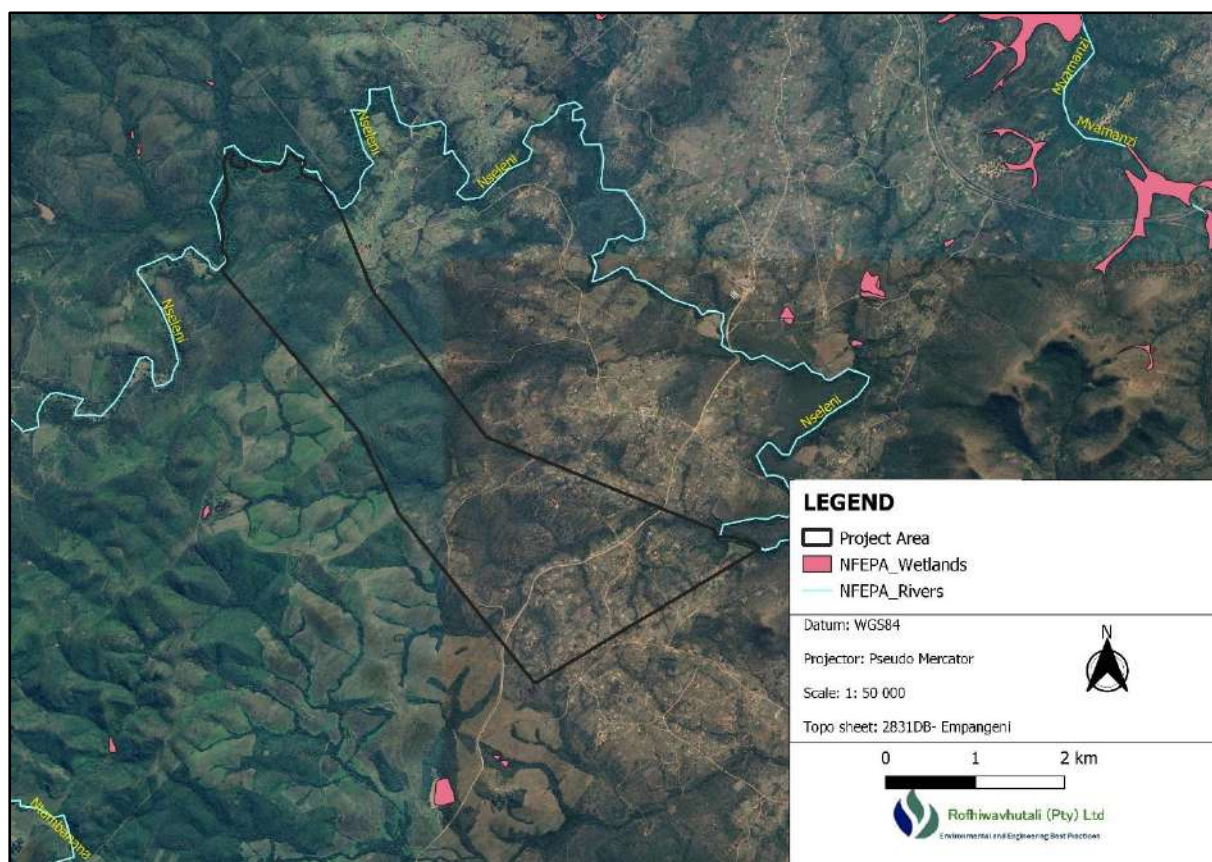


Figure 10-1: Surface waterbodies

11. GEOHYDROLOGICAL IMPACT ASSESSMENT

An Environmental Impact Assessment involves forecasting potential outcomes based on the interpretation and analysis of the data and information available at the time of its preparation. The methodology adopted for this assessment aligns with recognized international best practices. The evaluation specifically examined the possible effects of the proposed project activities on both groundwater and surface water resources.

Each identified impact is first described in terms of its nature and the sensitive receptors that may be influenced. This is followed by an assessment of the impact's significance before any mitigation is applied (initial risk rating), suggested mitigation strategies, and an evaluation of the residual impact expected after these measures are implemented. Table 11-1, Table 11-2 and Table 11-3 outlines the Risk Matrix used to evaluate impact severity by comparing the probability of occurrence with the potential magnitude.

The significance of identified impacts was determined using the approach outlined below (terminology from the Department of Environmental Affairs and Tourism Guideline document on EIA Regulations, April 1998). This approach incorporates two aspects for assessing the potential significance of impacts, namely occurrence and severity, which are further subdivided as follows:

Table 11-1: Impact Assessment Factors

Occurrence		Severity	
Probability of occurrence	Duration of occurrence	Scale/extent of impact	Magnitude of impact

To assess these factors for each impact, the following four ranking scales are used:

Table 11-2: Impact Assessment Scoring Methodology

Magnitude	Duration
10- Very high/ unknown	5- Permanent (>10 years)
8- High	4- Long term (7-10 years, impact ceases after site closure has been obtained)
6- Moderate	3- Medium-term (3 months- 7 years, impact ceases after the operational life of the activity)
4- Low	2- Short-term (0-3 months, impact ceases after the construction phase)
2- Minor	1- Immediate
Scale	Probability
5- International	5- Definite/Unknown

Magnitude	Duration
4- National	4- Highly Probable
3- Regional	3- Medium Probability
2- Local	2- Low Probability
1- Site Only	1- Improbable
0- None	0- None

Significance Points= (Magnitude + Duration + Scale) x Probability

Table 11-3: Significance of impact based on point allocation

Points	Significance	Description
SP>60	High environmental significance	An impact which could influence the decision about whether or not to proceed with the project regardless of any possible mitigation.
SP 30-60	Moderate environmental significance	An impact or benefit which is sufficiently important to require management and which could have an influence on the decision unless it is mitigated.
SP<30	Low environmental significance	Impacts with little real effect and which will not have an influence on or require modification of the project design.
+	Positive impact	An impact that is likely to result in positive consequences/effects.

11.1. Construction phase

The construction phase will involve preparatory works to ready the site for operational activities.

11.1.1. Impacts on groundwater quantity

- The establishment of hard paved areas during infrastructure construction and haul road construction reduces the recharge of aquifers due to increased runoff.
- An increase in subsurface permeability may lead to localised changes in groundwater flow dynamics and water levels within the shallow aquifer system.

- Dewatering of construction sites and resultant altering of the localised groundwater flow regime. Dewatering at excavations for construction purposes can cause localised altering of the flow and levels of the groundwater at the construction site.

11.1.2. Impacts on groundwater quality

In terms of groundwater quality, the potential risk is from accidental spills of hydrocarbons or other chemicals from construction vehicles. The operation of the fuel and lubricants storage facility has the potential for causing contamination of surface water due to infrastructure failure (emergency), leakage or spillages during normal operation. Included in normal operation is the potential for the incorrect disposal of spill absorbing material.

The operation of offices, ablutions and maintenance areas has the potential for the contamination of groundwater due to incorrect disposal of domestic and hazardous wastes, incorrect handling of workshop effluent spills and leaks. These incidents are considered unlikely, and if they occur, are typically localized and reversible with proper containment and remediation. The severity of such impacts is rated as low during the relatively short construction period, especially when mitigation measures are applied. The impact assessment and risk ratings are detailed in Table 11-4. Key management objectives during construction include the development and implementation of a Standard Operating Procedure (SOP) for containing and cleaning up any accidental chemical or hydrocarbon spills. Measures include the immediate containment of spills, excavation of contaminated soil where necessary, and proper disposal of waste material at certified facilities.

11.1.3. Groundwater management

- All spillages will need to be cleaned up as soon as practically possible.
- Report any significant spillage of chemicals, fuels etc. during the lifespan of the mining activities to the Department of Water and Sanitation and other relevant authorities.
- Park the machinery at the prospecting area with drip trays placed underneath stationary vehicles.
- Site Manager to ensure day-to-day compliance with the guidelines as stipulated in the EMPR.
- Compliance to be monitored by the independent Environmental Control Officer during the annual environmental audit.
- Proper management of stormwater drainage infrastructure should be ensured.
- Vehicles and machinery will be maintained in good order to minimise leakages.
- Spill kits will be made available in areas of likely spillage.
- All hydrocarbon storage containers will be stored within a bunded areas which are watertight and able to contain 110% of the stored volume and
- All equipment utilising hydrocarbons will be stored on a hard standing surface.

Table 11-4: Impact Assessment on groundwater quality during construction

POTENTIAL IMPACT	Magnitude	Duration	Scale	Probability	Significance	Significance without Mitigation	Magnitude	Duration	Scale	Probability	Significance	Significance with Mitigation	Detailed Mitigation Measures
Construction Phase													
Hydrocarbon spills contaminating groundwater	6	2	2	4	40	Moderate	4	2	2	2	16	Low	Bunded fuel storage; drip trays; lined refuelling area; spill kits; staff training; leak detection.
Inadequate sewage & wastewater management	6	2	1	4	36	Moderate	4	2	1	2	14	Low	Chemical toilets; weekly servicing; and no discharge to soil.
Hazardous material storage leakage	6	2	2	3	30	Moderate	4	2	1	2	14	Low	Bunded chemical storage; inspections; trained staff.
Alteration of groundwater flow from excavations	5	2	2	3	27	Low	4	2	1	2	14	Low	Maintain drainage paths; stabilise trenches; avoid recharge zones.
workshop, chemical stores, and plant storage areas	4	2	2	4	32	Moderate	4	2	1	3	21	Low	Hardstand storage. Spill kits on site. Remove impacted soils immediately.
Dust suppression activities	6	2	1	3	27	Low	4	1	1	4	24	Low	Avoid over-watering to prevent pooling and infiltration.

11.2. Operational phase

11.2.1. Impacts on groundwater quantity

The establishment of hard paved areas during infrastructure construction and haul road construction reduces the recharge of aquifers due to increased runoff. The removal of vegetation reduces the recharge of rainwater to aquifers due to increased run-off. The detailed impact assessment and associated risk rating for groundwater quantity during the operational phase are provided in Table 11-5.

11.2.2. Impacts on groundwater quality

Groundwater quality can be compromised through leachate of petroleum, chemical, harmful and hazardous substances. In particular, oil spills, diesel and grease from vehicles, trucks, equipment and drilling machinery and transportation vehicles utilised during the prospecting operations may occur. Such spills may poison aquatic life (Stebbins 2006). The detailed impact assessment and associated risk rating for groundwater quality` during the operational phase are provided in Table 11-5.

11.2.3. Groundwater management

- All spillages will need to be cleaned up as soon as practically possible.
- Proper management of stormwater drainage infrastructure should be ensured.
- Site Manager to ensure day-to-day compliance with the guidelines as stipulated in the EMPR.
- Compliance to be monitored by the independent Environmental Control Officer during the annual environmental audit.
- Maintain construction vehicles and encourage contractors to report, react and manage all spills and leaks so that action can be taken to immediately minimise contamination to the groundwater.
- Portable ablution facilities with suitable containment systems should be on site for use during prospecting operations. Waste should be properly contained to avoid any leakages be regularly be disposed off a suitable site.
- Spill kits will be made available in areas of likely spillage.
- All hydrocarbon storage containers will be stored within bunded areas which are watertight and able to contain 11% of the stored volume.
- All equipment utilising hydrocarbons will be stored on a hard standing surface.

Table 11-5: Operational Phase Impact Assessment

POTENTIAL IMPACT	Magnitude	Duration	Scale	Probability	Significance	Significance without Mitigation	Magnitude	Duration	Scale	Probability	Significance	Significance with Mitigation	Detailed Mitigation Measures
Operational Phase													
leakage from storage (fuel, chemicals, wastewater)	6	3	2	4	44	Moderate	4	3	2	2	18	Low	Impermeable flooring; leak-detection sensors; secondary containment; routine inspections.
Contamination from operational waste handling	6	3	2	3	33	Moderate	4	3	2	2	18	Low	Maintain equipment; use drip trays, bunded refuelling areas
Inadequate sewage & wastewater management	6	3	2	4	44	Moderate	4	3	2	2	18	Low	Chemical toilets; weekly servicing; and no discharge to soil.
Workshop and plant storage areas	6	3	2	3	33	Moderate	4	3	2	2	18	Low	Hardstand storage. Spill kits on site. Remove impacted soils immediately.
Dust suppression activities	6	3	2	3	33	Moderate	4	3	1	2	16	Low	Avoid over-watering to prevent pooling and infiltration.

11.3. Decommissioning phase

The decommissioning phase will begin once the activities for the Project have ended. This phase will continue until formal closure is achieved, after which the Post-Closure Phase will commence.

Although no significant impacts on groundwater quality, quantity, or flow patterns are anticipated, a rehabilitation plan must be implemented. This plan should align with the provisions of the National Water Act (Act No. 36 of 1998) to prevent or mitigate any potential environmental impacts. A zero-effluent discharge approach should be adopted. Measures such as water recycling, reuse, and/or treatment should be applied to support this objective.

11.4. post-mining phase

11.4.1. Groundwater quality

The corresponding impact assessment and risk rating for groundwater quality during the post-closure period are detailed in Table 11-6.

Table 11-6: Decommissioning Impact Assessment

POTENTIAL IMPACT	Magnitude	Duration	Scale	Probability	Significance	Significance without Mitigation	Magnitude	Duration	Scale	Probability	Significance	Significance with Mitigation	Detailed Mitigation Measures
Decommissioning and Closure Phase													
Disturbance of soils leading to polluted runoff to groundwater	6	3	2	3	33	Moderate	4	2	1	3	21	Low	Stabilise soils; berms to prevent infiltration.
Potential future decommissioning activities will likely involve dismantling and removing the supporting infrastructure, as well as transferring waste materials to disposal, recycling, and/or treatment facilities, as applicable (where re-use is not possible).	6	2	2	3	30	Moderate	4	2	2	3	24	Low	The study area should be revegetated with indigenous vegetation to help with soil compaction, runoff, erosion and dust control as required.
Potential decommissioning activities will likely involve dismantling on-site, equipment, and facilities. During this period, there will be vehicular traffic, thus increasing the likelihood of soil contamination.	6	2	2	3	30	Moderate	4	1	2	3	21	Low	Any portions of the site with compacted soil should be decompacted.
Loss of aquifer recharge areas due to abandoned infrastructure	6	4	3	3	39	Moderate	4	2	2	3	24	Low	Full site rehabilitation; removal of impervious surfaces; restore natural infiltration.

11.5. Cumulative impacts

A cumulative impact is the impact on the environment that results from the incremental impact of the action when added to the other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions (Nas Whidbey, 2018). The aquifers within the region are classified as minor aquifer systems and their main function is a domestic water supply source as well as supplying base flow to the surface water environment. This will result in a positive impact locally and could see the importance of groundwater increasing as a potential source within the catchment.

However, the water quality within the workings could be good or deteriorate depending on the geochemical characteristics of the material. This could in turn result in surface water users being put under pressure should the area water quality lead to the deterioration of surface water resources in the catchment. The cumulative impact on the catchment will have to be considered for prospecting, agriculture and the remainder of the current surface and groundwater uses in the project area management area.

12. GROUNDWATER MONITORING SYSTEM

12.1. Monitoring objectives

Monitoring, measuring, evaluating, and reporting are key components of the groundwater management programme. These actions are intended to identify and manage any unforeseen impacts on groundwater resources associated with exploration drilling activities. The key objectives of groundwater monitoring are to:

- To provide reliable groundwater data that can be used for management purposes.
- The early detection of changes in groundwater quality and quantity.
- Provide an on-going performance record on the efficiency of the Water Management Plan.
- Obtain information that can be used to redirect and refocus the Water Management Plan.
- Determine compliance with environmental laws, standards and the water use licence and other environmental authorizations.

This will ensure that management is timely warned of problems and unexpected impacts that might occur, and can be positioned to implement mitigation measures at an early stage.

12.2. Groundwater monitoring network

12.2.1. System response monitoring network

A comprehensive Water Management Plan is required to ensure that proposed activities do not result in unacceptable changes to groundwater quality or levels. This plan will also function as an early warning system, enabling the timely implementation of mitigation strategies to minimize potential impacts. To safeguard the groundwater environment, continuous

monitoring of both water quality and groundwater levels is necessary throughout the life of the project.

Monitoring is required for the following purposes:

- Timely detect actual impacts on groundwater quantity and quality.
- Address uncertainties identified in this report through field investigations that improve understanding of the aquifer system.

Monitoring should generally adopt a risk-based approach to identify and characterize the risks that mining activities and associated infrastructure may pose to the surrounding environment. Risk assessments involve understanding how a hazard is generated, the likelihood of its occurrence, and the potential consequences—capturing the full cause-and-effect cycle. A fundamental risk assessment framework includes three key components: the source of the risk (source term), the pathway it travels, and the receptor that is potentially affected. This method helps define the causal links between activities and environmental impacts.

The placement of monitoring boreholes should strategically cover:

- background conditions (upgradient of the source),
- conditions at the source,
- conditions downgradient from the source, and
- points along the pathway to the final receptor.

The primary aim of groundwater monitoring is to ensure minimal negative impacts on natural water resources. More broadly, it serves to verify that water management systems operate effectively, provide early detection of potential pollution, ensure regulatory compliance, and support environmental reporting. The preliminary monitoring program for the site plans for the proposed prospecting right application are presented below. The recommended monitoring borehole/points are given below in Table 12-1.

Table 12-1: recommended monitoring points

BH ID	Latitude	Longitude
BH1	-28.6057	31.86731
BH2	-28.5894	31.79144
BH3	-28.588	31.79699
BH4	-28.5565	31.80365

Water levels of these boreholes will be determined on a quarterly basis when the sampling is done. Samples will be analyzed for chemical and physical constituents normally associated with coal mining. If, in the future, contamination levels exceed critical environmental thresholds, new monitoring boreholes should be drilled upstream and downstream of the original site.

12.2.2. Sampling Methods and Preservation

Required apparatus:

- Plastic bottles (1L)
- Glass bottles
- Dip meter
- Steel bailer
- Cooler box
- EC and Ph meter
- Marking pens

12.2.3. Methods and preservation

One litre plastic bottles with unlined plastic caps are required for most sampling exercises; however, in cases where organic constituents are to be tested for, glass bottles are required. Sample bottles must be marked clearly with the borehole name, date of sampling, water level depth and the sampler's name. Water levels (mbgl) should be measured prior to taking the sample, using a dip meter. Purging must be done on each borehole that needs to be sampled, this is to ensure sampling of the aquifer and not stagnant water in the casing. Purging is done using a submersible pump or a clean disposable polyethylene bailer in the event of a small diameter borehole. During purging and continuous water quality monitoring, at least three borehole volumes of water should be removed until the electrical conductivity value stabilizes. Metal samples must be filtered in the field to remove clay suspensions. The pH and EC meter used for field measurements should be calibrated daily using standard solutions obtained from the instrument supplier. Samples should be kept cool in a cooler box in the field and kept cool prior to being submitted to the laboratory in order to maintain proper preservation thereof.

12.3. Monitoring parameters

The groundwater parameters should be monitored by a qualified Hydrogeological Specialist. As per minimum requirements the following variables should be monitored at minimum quarterly frequency:

- pH, EC
- TDS
- Major cations including Ca, Mg, Na, K
- Major anions including Cl, SO₄, T-Alk (HCO₃⁻/CO₃⁻)
- Minor cations/metals including Fe, Al, Mn, Ni, Cr, Cr⁶⁺, V, Si, F
- Nutrients including PO₄⁻, NO₃⁻, NH₄⁺
- Groundwater levels

12.4. Data Management

Good hydrogeological decisions require sound information developed from raw data. The production of good, relevant, and timely information is the key to achieving qualified long-term and short-term plans. It is necessary to utilize all relevant groundwater data in order to minimize groundwater contamination. Monitoring results may be captured in an electronic database as soon as results become available, which allows for:

- Data presentation in tabular format,
- Time-series graphs with comparison abilities,
- Graphical presentation of statistics,
- Presentation of data, statistics and performance on diagrams and maps,
- Comparison and compliance to legal and best practice water quality standards.

12.5. Reporting

Reporting on groundwater quality conditions will be included in the annual report. The contents of the report should include the monthly water monitoring results and trends at surface points, as well as comments on the effectiveness of the mitigation measures and monitoring program. Reporting to the authorities should be as specified in the permitting/licensing conditions, and any accidental release of pollutants or possible polluting substances should be reported to the relevant authorities as specified in the Mining right conditions. Laboratory results will be analyzed against the target water quality guidelines for domestic use, the aquatic environment, livestock watering and irrigation (according to the South African National Standards for drinking water; SANS 241:2015). The strictest value between the target water quality objectives or objectives through a reserve determination will be used.

13. CONCLUSION AND RECOMMENDATIONS

- The Prospecting Right area covers approximately 1,160 ha; Exploration of coal will be undertaken using Core drill rig and associated equipment.
- From a geohydrological perspective, the project is considered low-risk due to the shallow nature of the targeted material, the limited depth of excavation, low water demand during operations, and the absence of direct groundwater abstraction for project activities.
- The surface material layer that is found on site have a medium capacity to absorb contaminants and a medium capacity to create an effective barrier to contaminants.
- In accordance with the Groundwater Protocol (Version 2), the vulnerability of the aquifer under the proposed site is rated as medium risk based on the prevailing hydrogeological conditions.
- The implementation of strict hydrocarbon handling procedures, effective spill prevention measures, and well-designed stormwater management systems further reduces potential groundwater-related risks.
- The surface material at the site exhibits medium absorption capacity and medium effectiveness as a contaminant barrier.

- Bacteria and viruses are expected to undergo high reduction in the unsaturated zone, providing effective natural attenuation.
- Nitrates, phosphates, and chlorides will experience limited to minimal reduction, indicating potential chemical persistence.
- Hydrocarbons are likely to be minimally reduced, highlighting possible mobility through the subsurface.
- The silt layer acts as a good barrier to microbial transport, but its effectiveness for chemical contaminant reduction is low.
- Overall, the unsaturated zone offers strong protection against biological contaminants but limited attenuation for chemical contaminants.
- Based on the baseline hydrogeological conditions and the proposed mitigation measures, no significant impacts on groundwater quality, groundwater levels, or aquifer yield are anticipated during the construction, operational, or decommissioning phases of the project.

Recommendations

To ensure continued protection of groundwater resources and compliance with geohydrological best practice, several measures are recommended.

- In terms of pollution prevention, all hydrocarbons such as diesel, oils, and lubricants must be stored in impermeable and watertight bunded areas capable of containing at least 110% of the stored volume.
- All machinery, generators, and refuelling points should be positioned on hard standing surfaces to prevent spills from infiltrating the soil and aquifer.
- Report any significant spillage of chemicals, fuels etc. during the lifespan of the prospecting activities to the Department of Water and Sanitation and other relevant authorities.
- Spill kits must be available at all hydrocarbon storage and handling points, and any spillages must be cleaned immediately using suitable absorbent material and disposed of at licensed waste facilities.
- Effective stormwater management is essential, and the stormwater system must be maintained to prevent contaminated run-off from entering the soil profile or reaching nearby surface water bodies.
- No uncontrolled discharges resulting in pollution of the receiving environment and aquifer shall be permitted.
- Waste management must include strict segregation, secure storage, and regular removal of waste to prevent leachate generation. Hazardous waste, including oils, contaminated rags, and used filters, must be disposed of at licensed hazardous waste facilities, and all disposal certificates must be retained for audit purposes.
- Water seeping into filled levels on site must be prevented.
- Legal compliance must be maintained, and should any activity trigger a Section 21 water use under the National Water Act (Act 36 of 1998), a Water Use Licence (WUL) application must be submitted.
- Rehabilitation and closure planning should follow a progressive approach.
- Disturbed areas must be reshaped, re-soiled, stabilised, and vegetated to promote long-term land stability and reduce future infiltration or erosion risks.

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Soil, Land Use and Land Capability Assessment

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DMRE Ref No: KZN 30/5/1/1/2 12129 PR

NAME OF THE APPLICANT: MOLOBEDU MAKOWENI (PTY) LTD

PROSPECTING RIGHT APPLICATION FOR COAL ON FARM LOT 289 EMPANGENI 13389 GU, AND LOT 285 EMPANGENI 13400 GU, SITUATED IN KING CETSHWAYO DISTRICT, KWA-ZULU NATAL PROVINCE.

2026

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DOCUMENT TRACKING

Project Name	Soil, land Use and land Capability and agricultural potential verification assessment for Prospecting Right Application for coal in respect of Lot 289 Empangeni 13389 GU, Lot 285 Empangeni 13400 GU, situated in King Cetshwayo district, Kwa-Zulu Natal Province.	
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1. INTRODUCTION

Molobedu Makoweni (Pty) Ltd, hereafter referred to as 'the applicant' or Molobedu', has applied for a prospecting right for coal in respect of Lot 289 Empangeni 13389 GU, Lot 285 Empangeni 13400 GU, situated in King Cetshwayo district, Kwa-Zulu Natal Province, for an extent area of is 1,160 ha.

Vahlengwe Mining Advisory and Consulting, as the Molobedu' appointed lead consultant, appointed Rofhiwavhutali (Pty) Ltd to compile a Soil, Land Use and Land Capability Assessment as part of Specialist Studies required for the Project.

The proposed non-invasive prospecting activities will include the following main techniques:

- Data search, field mapping and desktop studies;
- Logging and sampling historical core; and
- Scoping and (pre) feasibility studies.

For the purpose of this process, the Environmental Assessment Practitioner (EAP) and appointed specialist will perform a baseline and/or desktop assessment identifying potential sensitivities in the general area of the properties.

Should additional sampling be required using any invasive prospecting methods, the areas where these activities will take place will require the necessary assessments as per the various protocols published for identified themes and approval from the Department of Minerals, Resources and Energy (DMRE), prior to commencement of any such activities.

1.1. Aims and Objectives of the Study

The objective of the basic Soil, Land Use and Land Capability is to fulfill the requirements of the most recent South African Environmental Legislation with reference to the Conservation of Agricultural Resources Act (CARA), 1983 (Act No. 43 of 1983). This act aims to promote the conservation of soil, water sources, vegetation, and the control of weeds and invader plants through the management of natural agricultural resources.

The proposed study thus aims to determine the possible impacts that the proposed development could have on the soils, land use, land capability and agricultural potential and to also identify areas of high sensitivity regarding the proposed project. This is done by taking into consideration factors such as soil quality, drainage, topography, climate and water availability. Therefore, provide sufficient information that can help to ensure that land is used in a sustainable and responsible way.

The study objective will be achieved through determining:

- The soil forms occurring within the study area;
- The associated land capability and potential of the soils occurring within the study area;
- Discussion of the agricultural potential in terms of the soils, water availability, surrounding development and current status of land; and

- Discussion of potential and actual impacts as a result of the proposed development.

1.2. Suitability of soils for agricultural cultivation

The assessment of soils suitability for agricultural cultivation rests primarily on the identification of soils that are suited to crop production. In order to classify soils as being of suitable for crop cultivation they must have the following properties:

- Adequate depth (greater than 60 cm) to accommodate root development for majority of cultivated crops;
- Good structure as in water stable aggregates which allows for root penetration and water retention;
- Sufficient clay and organic matter to provide nutrients for growing crops;
- Sufficient distribution of high quality and potential soils within the study area to constitute a viable economic management unit;
- Adequate clay content and deep enough water table to allow for water storage; and
- Good climatic conditions such as sufficient rainfall and sunlight to increase crop choice variety.

1.3. Legal And Regulatory Requirements

The most recent South African Environmental Legislation that needs to be considered for any new or expanding development with reference to assessment and management of soil and land use includes:

- Soils and land capability are protected under the National Environmental Management Act 107 of 1998, the Minerals Act 28 of 2002 and the Conservation of Agricultural Resources Act 43 of 1983.
- The National Environmental Management Act 107 of 1998 requires that pollution and degradation of the environment be avoided, or, where it cannot be avoided, be minimised and remedied.
- The Conservation of Agricultural Resources (Act 43 of 1983) states that the degradation of the agricultural potential of soil is illegal.
- The Conservation of Agriculture Resources Act 43 of 1983 requires the protection of land against soil erosion and the prevention of water logging and salinization of soils by means of suitable soil conservation works to be constructed and maintained. The utilisation of marshes, water sponges and watercourses are also addressed.
- Government Notice R983 of 4 December 2014, Activity 21. The purpose of this notice is to identify activities that would require environmental authorisation prior to commencement of that activity.

1.4. Terms of Reference

The terms of reference applicable to the Soils, Land Capability and Land Use Study include the following:

- A review of available desktop information about the study area site and compile various maps illustrating the desktop data;
- Discussion of the relevant desktop literature;
- Conduct a soil classification survey covering the study area according to the South African Soil Classification System: A Natural and Anthropogenic System for South Africa (Soil Classification Working Group, 2018);
- Determination of the current (baseline) soil physical, climatic conditions and land uses, as well as the current land capabilities and soil potential associated with the identified soil forms present in the study area;
- Compile soil, land use and land capability and impact statement report under current on-site conditions based on the field finding data to be compared to the screening tool.

1.5. Assumptions, Assumptions uncertainties, limitations and gaps

The following assumptions, uncertainties, limitations and gaps were applicable for the basic soil, land use and land capability assessment:

- The information gathered during the desktop assessment must be considered with caution, as inaccuracies and data capturing errors are often present within these databases;
- The soil delineations as well as the associated land capability and agricultural potential was done at a high level due the low quantum of risk presented by the proposed development and therefore should not be used for any other purpose than it is intended for. Should the quantum of risk of the project change for any reason, then a detailed soil investigation, delineation and classification would have to be undertaken in fulfilment of the applicable legislation;
- The soil survey was confined to the study area outline with consideration of various land uses outside the study area considered;
- The land capability assessment covered all accessible areas within the defined focus area and proposed footprint. Where access was not possible, soil characteristics were interpreted using available historical soil information, aerial imagery, and recognised land use databases. The surrounding context was also considered to support accurate interpretation of site conditions;
- Soil profiles were observed using a 1.5m hand-held soil auger and thus a description of the soil characteristics deeper than 1.5m cannot be given; and
- Soils exist in a continuum; it is often difficult to classify any particular soil type. As a consequence, the soil classifications presented in this report are based on the "best fit" to the soil classification system of South Africa.

2. SITE DESCRIPTION

2.1. Site Locality

The proposed prospecting right area is located on Lot 289 Empangeni 13389 GU, Lot 285 Empangeni 13400 GU, situated in King Cetshwayo district, Kwa-Zulu Natal Province, for an extent area of is 1,160 ha. The prospecting area is situated 19 km North of Empangeni and 21 km West of KwaMbonambi town, using R34 access road (Figure 2-1 and Figure 2-2).

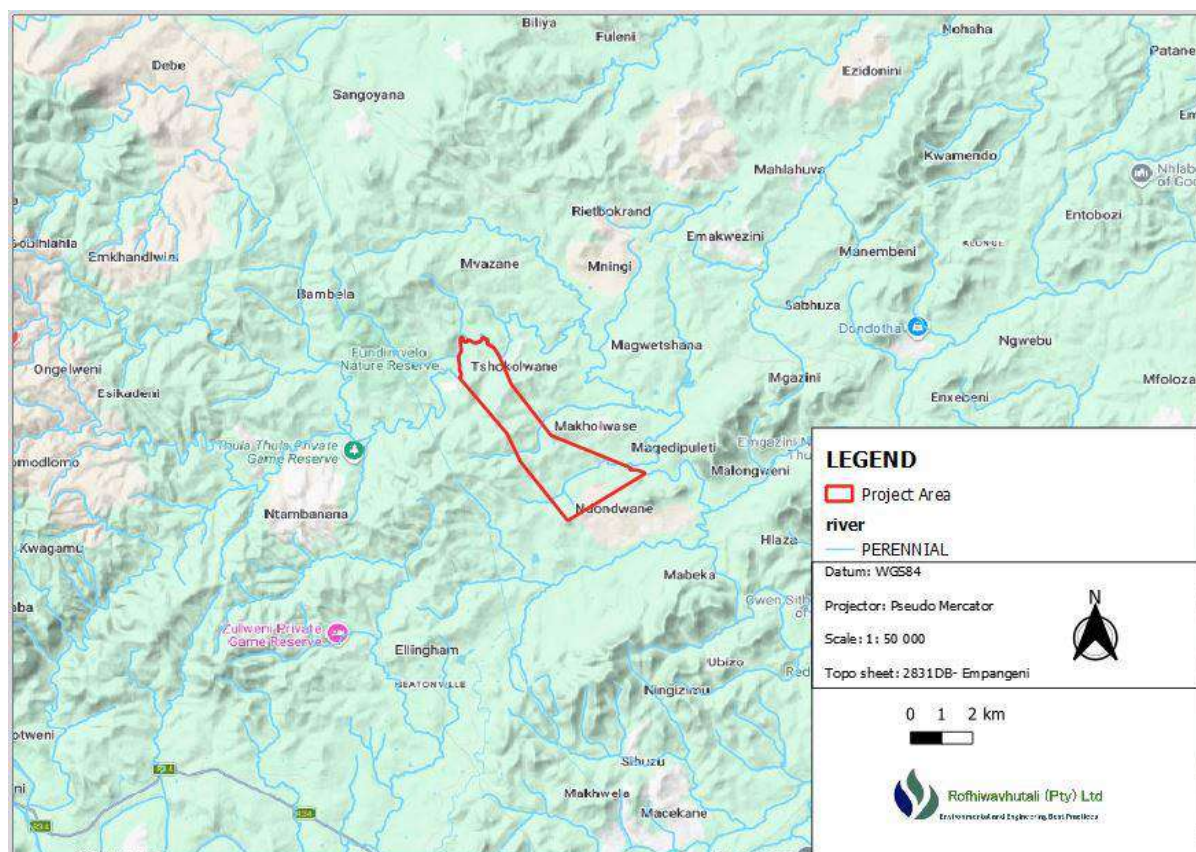


Figure 2-1: Locality Map

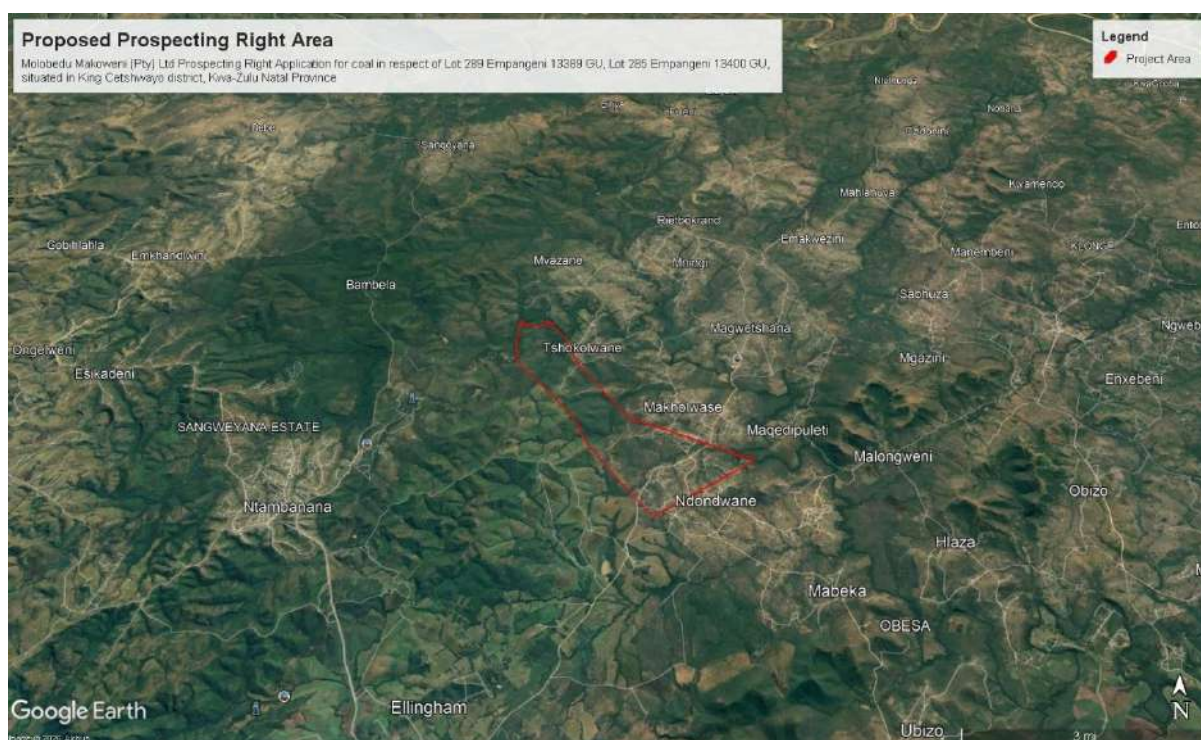


Figure 2-2: Google earth View of the site proposed for the development

3. STUDY METHODOLOGY:

The assessment of agricultural potential of the study area was based on a combination of desktop studies to amass general information and then through site visit for status quo assessment, soil classification and characterisation, and the validation of generated information from the desktop studies.

3.1. Desktop Study and Literature Review

A literature review and background study were carried out prior to beginning the field assessment to gather predetermined soil, land use, and land capability data in the study area. In order to validate the predetermined soil results obtained at the desktop level, a field investigation was conducted.

3.2. Site Survey

The field survey was conducted in February 2026 in which soils were classified into soil forms according to the Soil Classification System: A Natural and Anthropogenic System for South Africa Soil Classification System (2018).

3.3. Land Capability Classification

A land capability class is an interpretive grouping of land units with similar potential and containing limitations or hazards for long term intensive use of land for rainfed farming determined by the interaction of climate, soil and terrain. It is a more general term than land suitability and is more conservation oriented (See Table 3-1 below). It involves consideration

of (i) the risks of land damage from erosion and other causes and (ii) the difficulties in land use owing to physical land characteristics, including climate. Eight land capability classes were employed with potential decreasing and limitations and hazards increasing from class 1 to class 8. Classes 1 to 4 can be considered as arable, whereas Class 5 to 7 may be classified as wetland or watercourses, grazing, forestry or wildlife. The climate capability of an area as indicated in Table 3-2 below influences the land potential of an area. As part of the mitigation measures, the expected impacts of the proposed land use on soil and land capability were assessed.

Table 3-1: Land Capability Classification (Smith, 2006)

Land Capability Group	Land Capability Class						Intensity of Land Use				Limitations
		wildlife	Forestry	Light grazing	Moderate grazing	Intensive grazing	Light cultivation	Moderate cultivation	Intensive cultivation	Very intensive cultivation	
Arable	I										No or few limitations. Very high arable potential. Very low erosion hazard
	II										Slight limitations. High arable potential. Low erosion hazard
	III										Moderate limitations. Some erosion hazards
	IV										Severe limitations. Low arable potential. High erosion hazard.
Grazing	V										Water course and land with wetness limitations
	VI										Limitations preclude cultivation. Suitable for perennial vegetation
	VII										Very severe limitations. Suitable only for natural vegetation
Wildlife	VIII										Extremely severe limitations. Not suitable for grazing or afforestation.

Table 3-2: Climate Capability Classification (Scotney et al. 1987)

Climate Capability Class	Limitation Rating	Description
C1	None to slight	Local climate is favourable for good yield for a wide range of adapted crops throughout the year.
C2	Slight	Local climate is favourable for good yield for a wide range of adapted crops and a year-round growing season. Moisture stress and lower temperatures increase risk and decrease yields relative to C1.
C3	Slight to moderate	Slightly restricted growing season due to the occurrence of low temperatures and frost. Good yield potential for a moderate range of adapted crops.
C4	Moderate	Moderately restricted growing season due to low temperatures and severe frost. Good yield potential for a moderate range of adapted crops but planting date options more limited than C3.
C5	Moderate to severe	Moderately restricted growing season due to low temperatures, frost and/or moisture stress. Suitable crops may be grown at risk of some yield loss.
C6	Severe	Moderately restricted growing season due to low temperatures, frost and/or moisture stress. Limited suitable crops for which frequently experience yield loss.
C7	Severe to very severe	Severely restricted choice of crops due to heat, cold and/or moisture stress.
C8	Very severe	Very severely restricted choice of crops due to heat and moisture stress. Suitable crops at high risk of yield loss.

Climatic criteria, within the growing season, incorporate rainfall, evaporation, minimum and maximum temperatures as well as limitations linked to frost, wind and hail hazards. When assessing climatic factors, the system provides a dual approach, whereby permanent terrain and soil factors can be used to define soil capability, while with the addition of climatic factors can then be used to determine land potential (Scotney et al., 1991). However, the authors recommend the use of the overarching land capability classification in rainfed production environments, while soil capability can be used to comparatively rate soil capability of different areas. Table 3-3 below presents the land capability classes, whilst Table 3-4 presents a description thereof, according to Guy and Smith (1998).

Table 3-3: Land Potential Classes (Smith, 2006)

Soil Capability Class	Climate Capability Class							
	C1	C2	C3	C4	C5	C6	C7	C8
I	L1	L1	L2	L2	L3	L3	L4	L4
II	L1	L2	L2	L3	L3	L4	L4	L5
III	L2	L2	L3	L3	L4	L4	L5	L6
IV	L2	L3	L3	L4	L4	L5	L5	L6
V	(L3) Wetbased	(L3) Wetbased	(L4) Wetbased	(L4) Wetbased	(L5) Wetbased	(L5) Wetbased	(L6) Wetbased	(L6) Wetbased
VI	L4	L4	L5	L5	L5	L6	L6	L7
VII	L5	L5	L6	L6	L7	L7	L7	L8
VIII	L6	L6	L7	L7	L8	L8	L8	L8

Table 3-4: The Land Capability Classes description (Adapted from guy and smith, 1998)

Land Capability	Description of Land Capability Class
L1	Very high Capability: No limitations. Appropriate contour protection must be implemented and inspected.
L2	High Capability: Very infrequent and/or minor limitations due to soil, slope, temperatures or rainfall. Appropriate contour protection must be implemented and inspected.
L3	Good Capability: Infrequent and/or moderate limitations due to soil, slope, temperatures or rainfall. Appropriate contour protection must be implemented and inspected.
L4	Moderate Capability: Moderately regular and/or severe to moderate limitations due to soil, slope, temperature or rainfall. Appropriate permission is required before ploughing virgin land.
L5	Restricted Capability: Regular and/or moderate to severe limitations due to soil, slope, temperature or rainfall.
L6	Very restricted Capability: Regular and/or severe limitations due to soil, slope, temperature or rainfall. Non-arable.
L7	Low Capability: Severe limitations due to soil, slope, temperature or rainfall. Non-arable.
L8	Very low Capability: Very severe limitations due to soil, slope, temperature or rainfall. Non-arable.

Land capability refers to the highest level of sustainable land use for rainfed agriculture, based on the combined influence of climate, soil, and terrain conditions (Table 3-1).

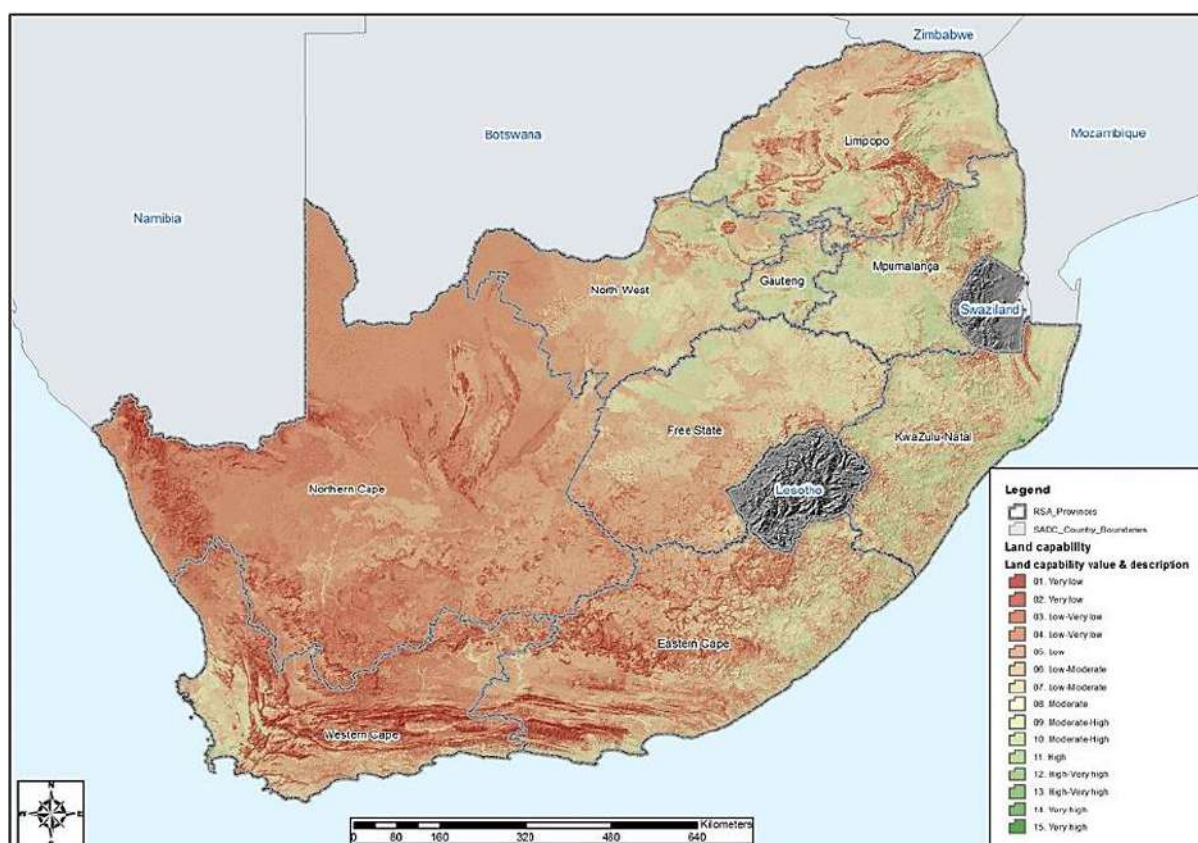


Figure 3-1: Land capability values and description

3.4. DAFF Screening Tool

The main purpose of the Agricultural Agro-Ecosystem Assessment is to ensure that the sensitivity of the site to the proposed land use change (from potential agricultural land to the proposed development) is sufficiently considered. The information provided in this report aims to enable the Competent Authority to come to a sound conclusion on the impact of the proposed development on the food production potential of the site.

To meet this objective, site sensitivity verification must be conducted of which the results must meet the following objectives:

- It must confirm or dispute the current land use and the environmental sensitivity as was indicated by the National Environmental Screening Tool;
- It must contain proof (e.g., photographs) of the current land use and environmental sensitivity pertaining to the study area;
- All data and conclusions are submitted together with the main report for the proposed development;
- It must indicate whether or not the proposed development will have an unacceptable impact on the agricultural production capability of the site, and in the event where it does, whether such a negative impact is outweighed by the positive impact of the proposed development on agricultural resources; and
- The report is prepared in accordance with the requirements of the Environmental Impact Assessment Regulations.

The report is thus compiled in a manner that meets the minimum report content requirements for impacts on agricultural resources by the proposed development.

4. RESULTS AND DISCUSSIONS

4.1. Desktop Assessment Results

4.1.1. Climatic Data

The mean daily maximum temperature (solid red line) represents the average of the highest temperatures recorded each day for every month in the project Area. The highest average maximum temperature occurs in the summer months, reaching approximately 30 °C, while the lowest average maximum temperatures occur in June and July, at approximately 24 °C.

Similarly, the mean daily minimum temperature (solid blue line) represents the average of the lowest temperatures recorded each day. The highest average minimum temperatures occur between January and March, at approximately 21 °C, while the lowest average minimum temperature is recorded in July, at approximately 12 °C (Figure 4-1). The mean annual rainfall across the site ranges between 801–1000 mm (Figure 4-2).

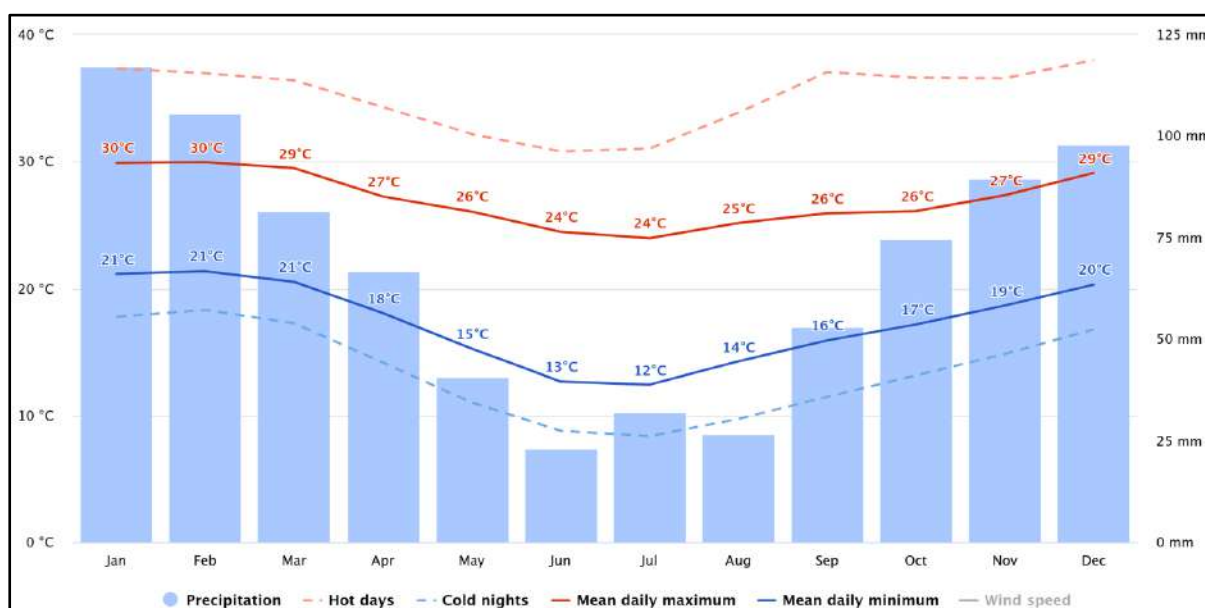


Figure 4-1: Average Climatic Conditions

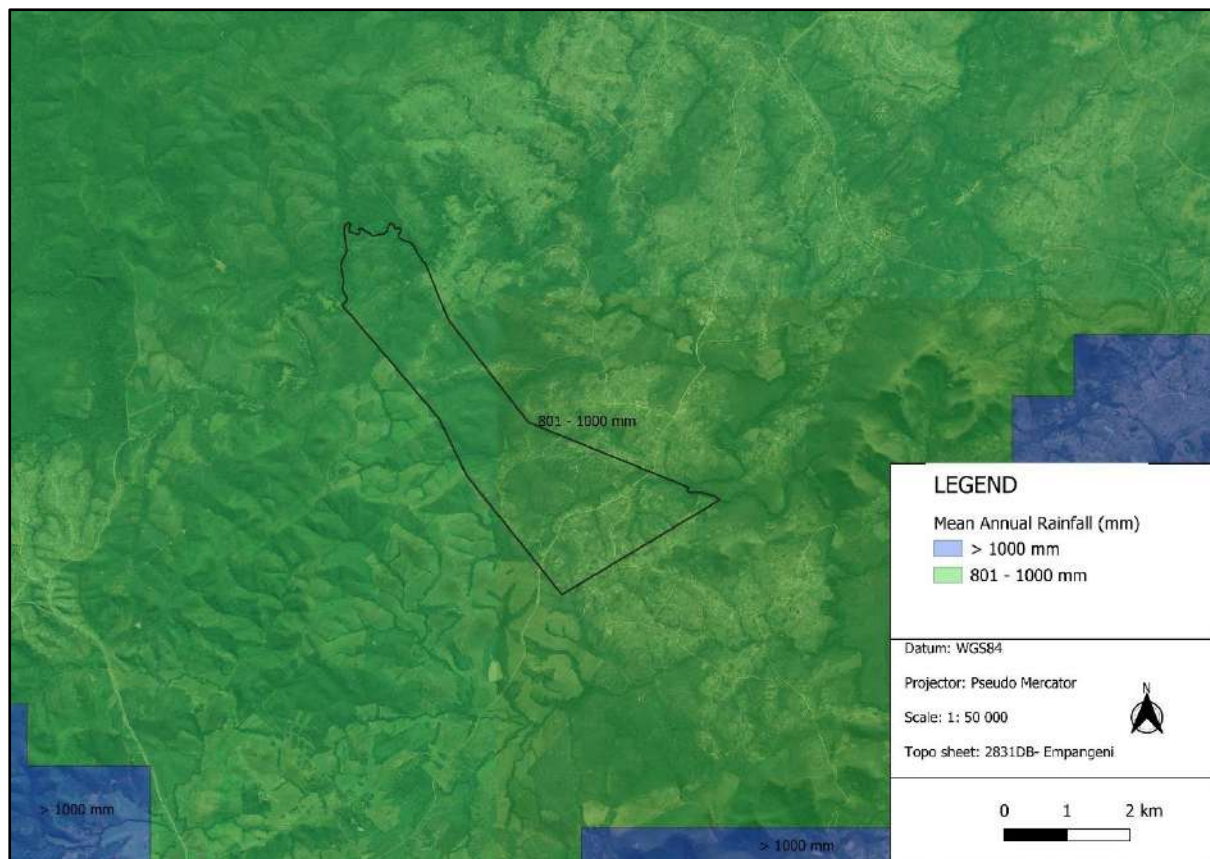


Figure 4-2: Mean Annual Rainfall associated with the project area

4.1.2. Geology and lithology of project Area

The project area is predominantly underlain by the Emakwezini, Ntabeni, Nyoko and Clarens Formations of the Beaufort Group, which are of Triassic to Late Jurassic age (King, 1997), together with intrusive Karoo dolerite occurring as dykes and sills. The Emakwezini Formation conformably overlies the Volksrust Formation of the Ecca Group and comprises approximately 500 m of shale and fine-grained sandstone, with minor siltstone interbeds. The sandstones are generally well-bedded and feldspathic, and thin coal seams occur throughout the unit. The Ntabeni Formation consists mainly of medium-grained, slightly feldspathic sandstone with subordinate shale, while the Nyoko Formation is dominated by mudstone horizons interbedded with thin layers of fine- to coarse-grained feldspathic sandstone. The combined thickness of the Ntabeni and Nyoko Formations is less than 50 m. The Clarens Formation comprises well-sorted, fine-grained calcareous and feldspathic sandstone with occasional thin mudstone lenses and was deposited in an arid alluvial fan environment. Karoo dolerite intrusions occur as dykes, typically 1–8 m wide and generally vertical to near-vertical in orientation, as well as sills ranging in thickness from approximately 1 m to more than 50 m. Figure 4-3 below depicts the geology associated with the project area.

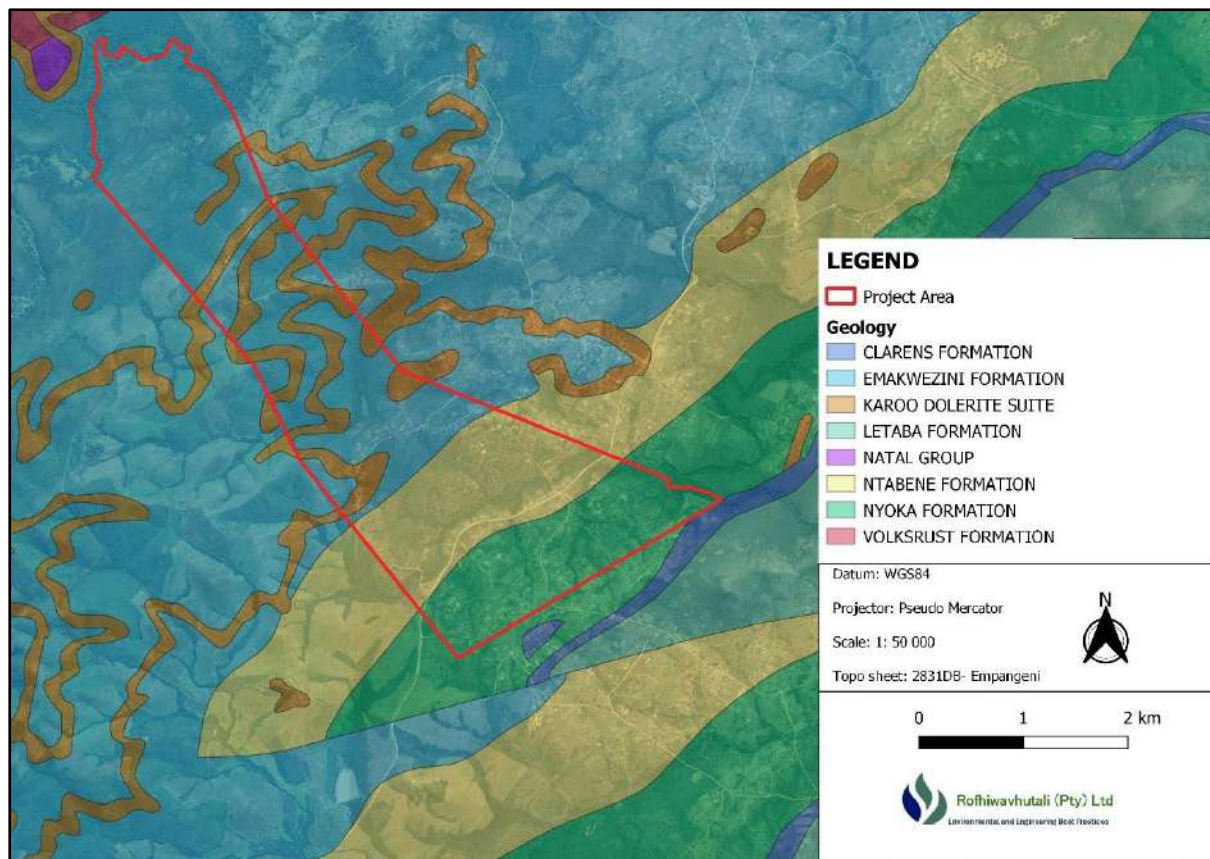


Figure 4-3: Geology Associated with the Project Area

4.1.3. Soil pH and Predicted Soil loss

The soil pH in the study area ranges from 5.5 to 6.4, indicating slightly acidic conditions. This pH range is generally considered suitable for most cultivated crops, as it falls within the critical zone where the availability of essential plant nutrients is typically good to very good. Figure 4-4 below depicts the soil pH associated with soils occurring within the study area.

The desktop assessment indicates that most of the study area falls within a moderate soil loss category, meaning the area is reasonably susceptible to erosion under current conditions, particularly during heavy rainfall. The north-eastern portion is classified as low risk, suggesting relatively stable conditions with limited erosion potential. In contrast, the south-eastern section is identified as high risk, indicating a greater likelihood of significant soil erosion, likely due to factors such as slope, soil type, or reduced vegetation cover. This suggests that the prevailing soil properties, topography, land cover, and current land use practices collectively contribute to a stable landscape with limited erosion risk. The gentle to moderate slopes, presence of surface cover, and inherent soil stability minimize detachment and surface runoff, thereby reducing the potential for soil degradation (Figure 4-5).

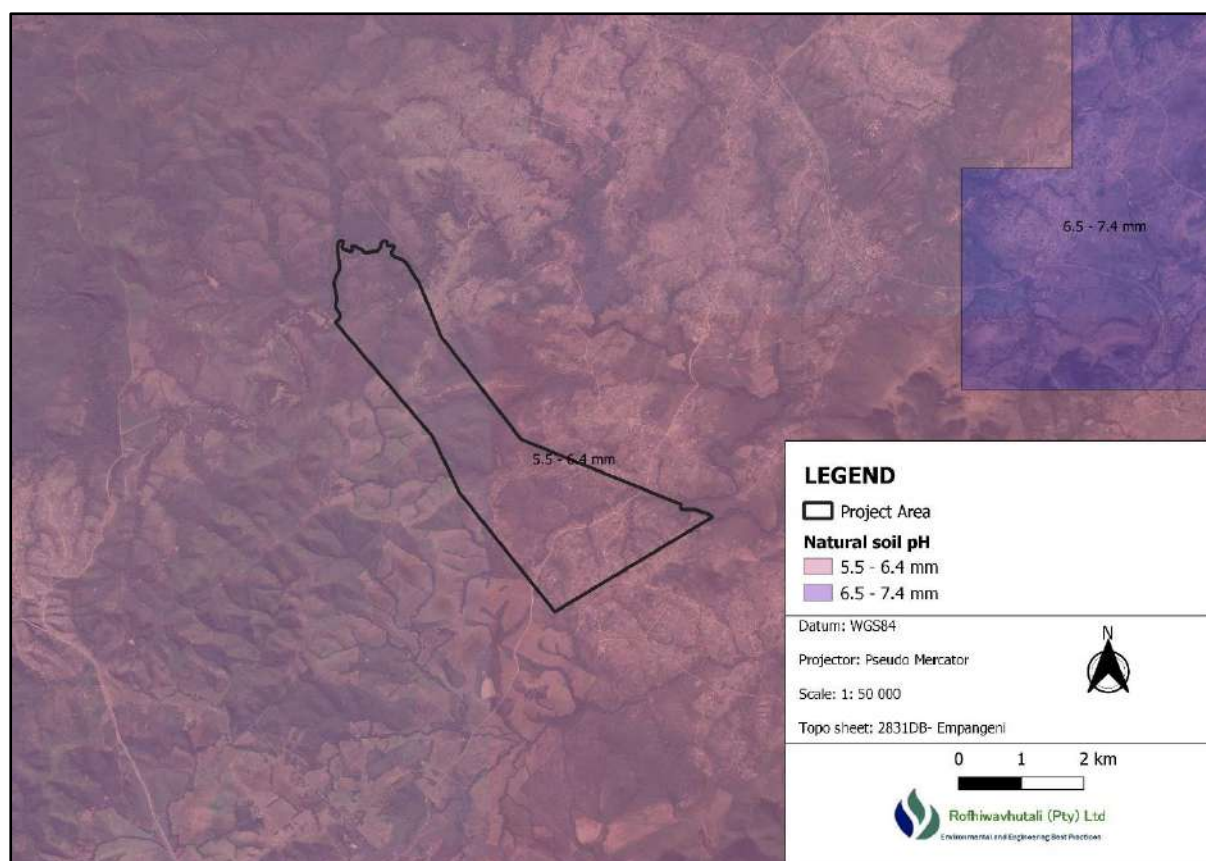


Figure 4-4: Soil pH associated with the Project Area

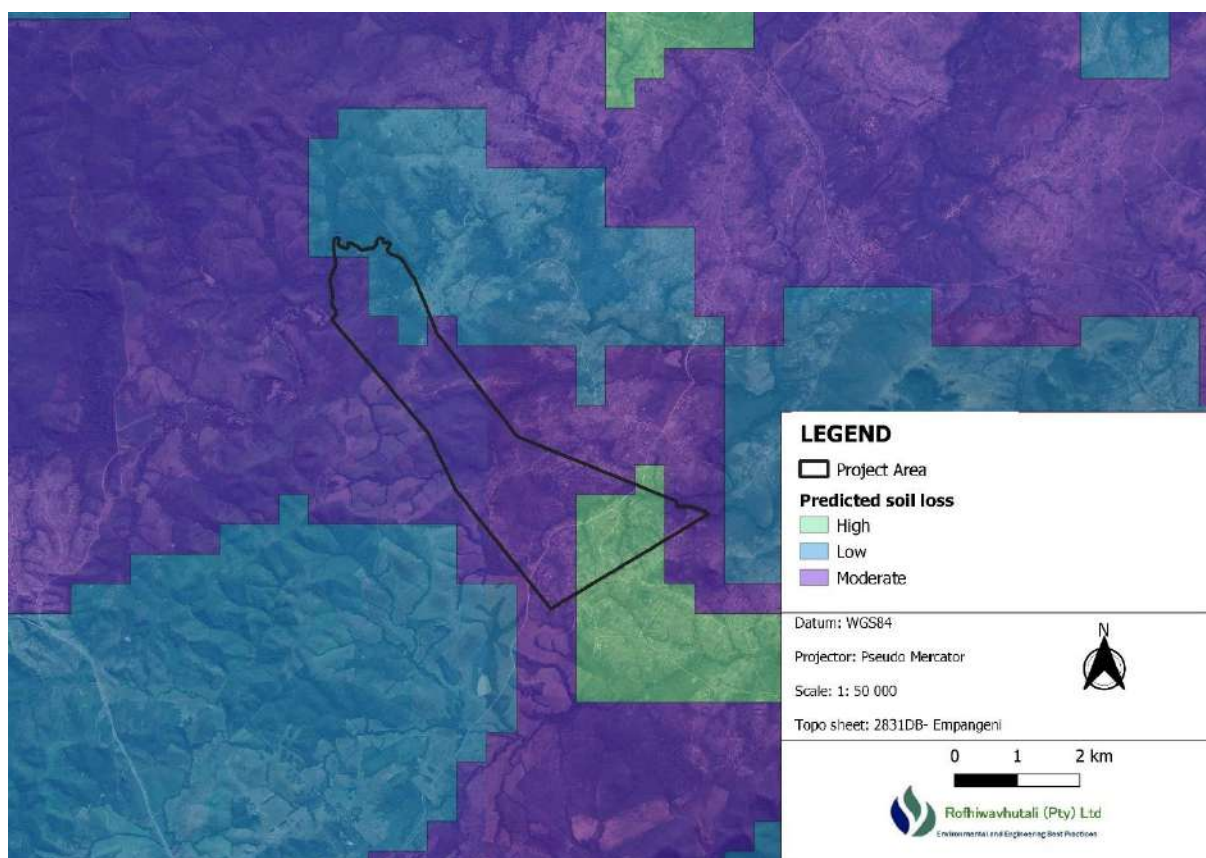


Figure 4-5: Predicted Soil loss

4.1.4. Landtype Data

According to the land type database (Land Type Survey Staff, 1972 - 2006) the development falls within the Db152 and Ea127 land type classes (Figure 4-6, Table 4-1 and Figure 4-7). These land types are defined by variations in topography, soil forms, and climatic conditions, which play a significant role in determining land use patterns and agricultural potential. The subsoils in the project area are predominantly comprised of horizons that include Soft plinthites, Prismacutanic, Albic, Gley, Pedocutanic, Lithic soils (shallow soils over hard rock), Hard rocks, soils with typically well-drained with moderate to high clay content and strong structure.

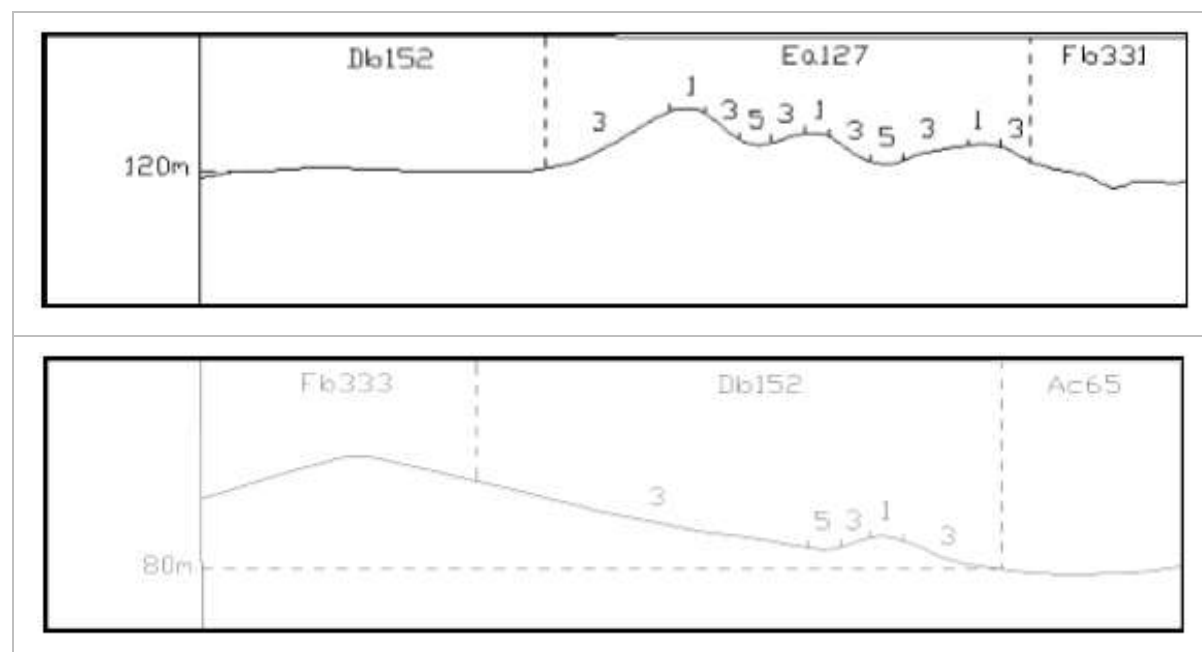


Figure 4-6: Typical terrain and terrain units of the land types

Table 4-1: Land types and Soil forms associated with the project Area

Land Type	Soil Form		
Ea127	- Bonheim (Bo) - Glenrosa (Gs) - Mispah (Ms) - Mayo (My)	- Shortlands (Sd) - Oakleaf (Oa) - Swartland (Sw) - Milkwood (Mw)	- Valsrivier (Va) - Fernwood (Fw) - Dundee (Du)
Db152	- Bonheim (Bo) - Sterkspruit (Ss) - Kroonstad)(kd) - Mispah (Ms) - Dundee (Du)	- Swartland (Sw) - Valsrivier (Va) - Oakleaf (Oa) - Glenrosa (Gs) - Katspruit (Ka)	- Mayo (My) - Westleigh (We) - Milkwood (Mw) - Arcadia (Ar)

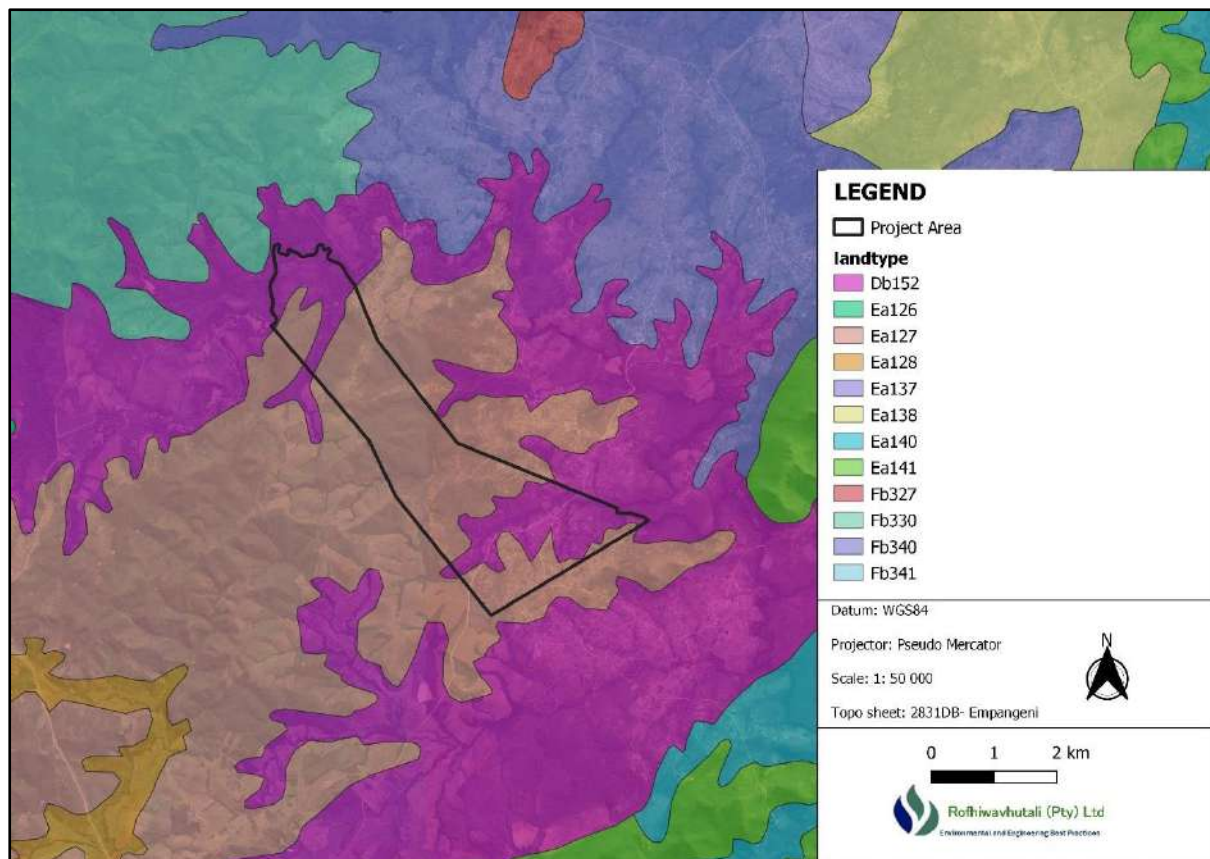


Figure 4-7: Land types associated with the study Area

4.1.5. Soil Classes

The project area is characterised by an association of Soil Classes 5, 6, 10, 11 and 12, which are predominantly composed of undifferentiated clay soils and soils exhibiting a pedocutanic horizon. These soil classes are generally associated with moderate to high clay content, resulting in relatively low permeability and reduced drainage capacity. The dominance of clayey materials suggests a higher water-holding capacity, increased shrink–swell potential, and a tendency toward seasonal waterlogging, particularly in low-lying or poorly drained areas.

The presence of a pedocutanic horizon indicates the accumulation of clay within the subsoil, reflecting processes of clay illuviation. Such horizons are typically dense and structured, which can restrict vertical water movement and root penetration. As a result, these soils may exhibit perched water tables during wet periods and slower infiltration rates compared to sandy or well-drained soils. Overall, the soil pattern within the project area suggests conditions that may influence surface runoff, infiltration dynamics, and hydrological response. (Figure 4-8).

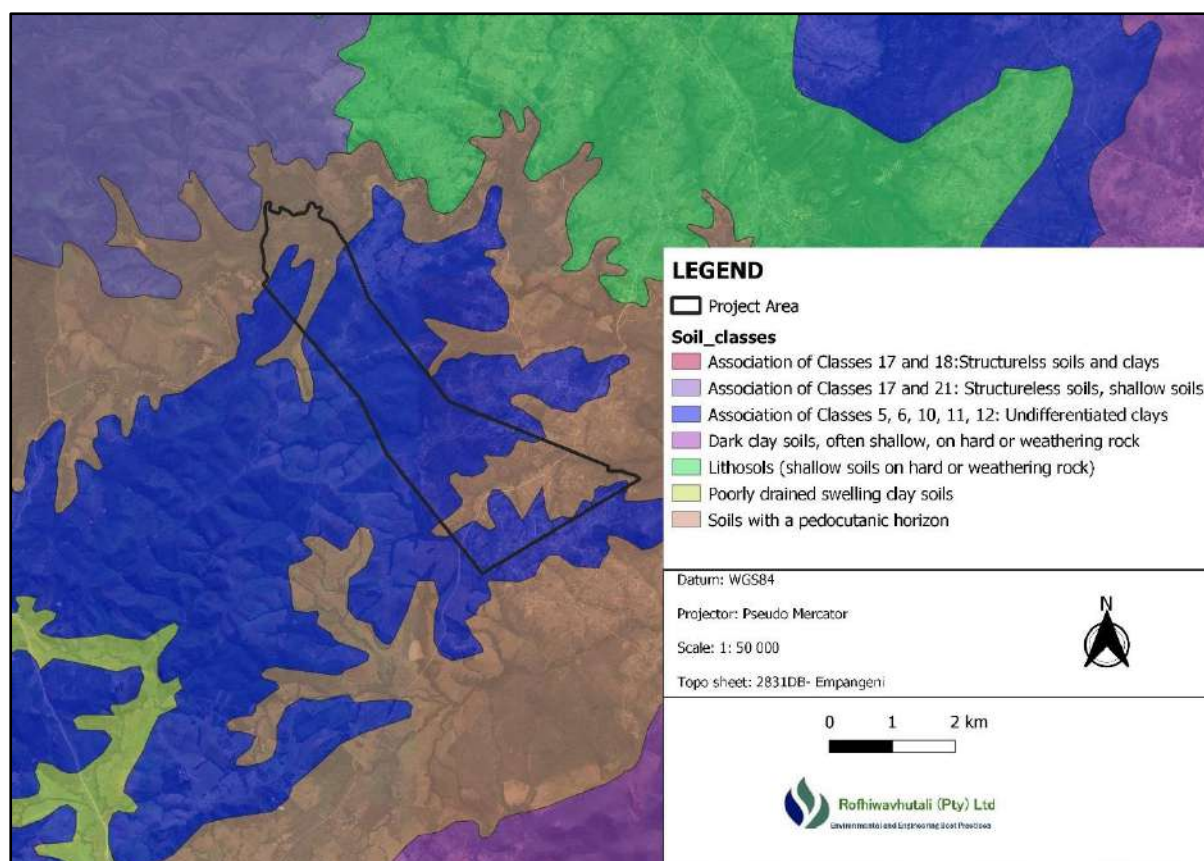


Figure 4-8: Soil Classes Map

4.1.6. SOIL AND TERRAIN (SOTER) DOMINANT SOILS

The majority of the study area is dominated by haplic luvisols and Luvic Kastanozems. Haplic Luvisols are characterised by a clay-enriched argic horizon, resulting from clay illuviation, which creates a textural contrast between the surface and subsoil layers. These soils typically exhibit moderate natural fertility and moderate drainage, although the clay-rich subsoil can restrict vertical water movement and promote lateral flow during wet conditions. Luvic Kastanozems, on the other hand, are generally associated with semi-arid to sub-humid environments and are characterised by a dark, humus-rich surface horizon with relatively high base saturation. The presence of a luvic (clay-enriched) subsoil horizon further indicates some degree of clay translocation, though these soils often retain good structural stability and moderate agricultural potential.

The dominance of these two soil groups suggests a landscape with moderate to high base status soils, variable textural profiles, and hydrological behaviour influenced by clay accumulation in the subsoil, which may affect infiltration, runoff generation, and subsurface flow dynamics. Figure 4-9 below illustrates the SOTER dominant soils associated with the study area.

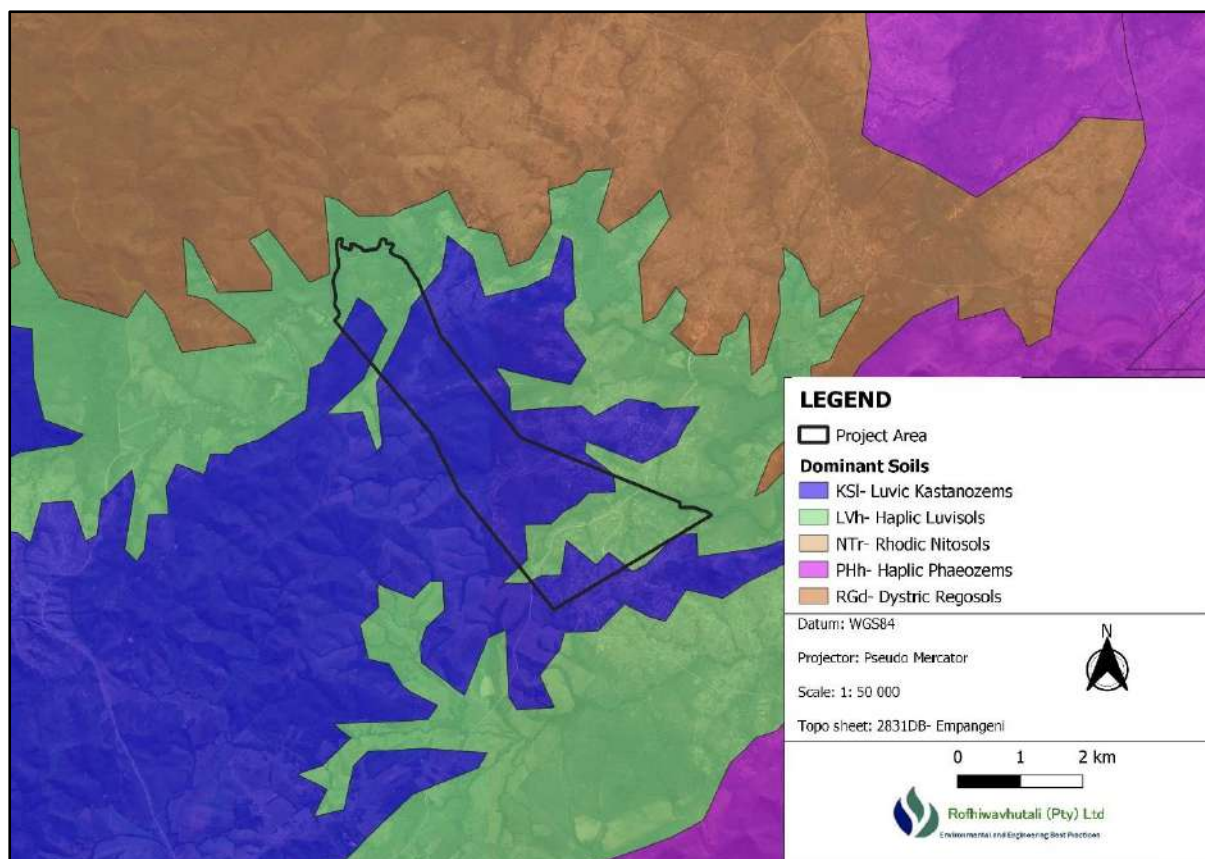


Figure 4-9: SORTER dominant Soils associated with the study area.

4.1.7. Desktop Soil Potential

The soil potential within the study area is predominantly classified as non- arable, low to moderate potential grazing land, and moderate potential arable land. high-potential arable land, covering most of the site. The majority of the area is classified as non-arable, reflecting inherent limitations such as low fertility, poor drainage, or shallow depth. Some portions are suitable for low to moderate potential grazing, indicating that livestock production may be feasible under current conditions. A smaller fraction of the landscape shows moderate potential for arable use, suggesting limited suitability for crop production. Figure 4-10 below depicts the desktop soil potential associated with the study area.

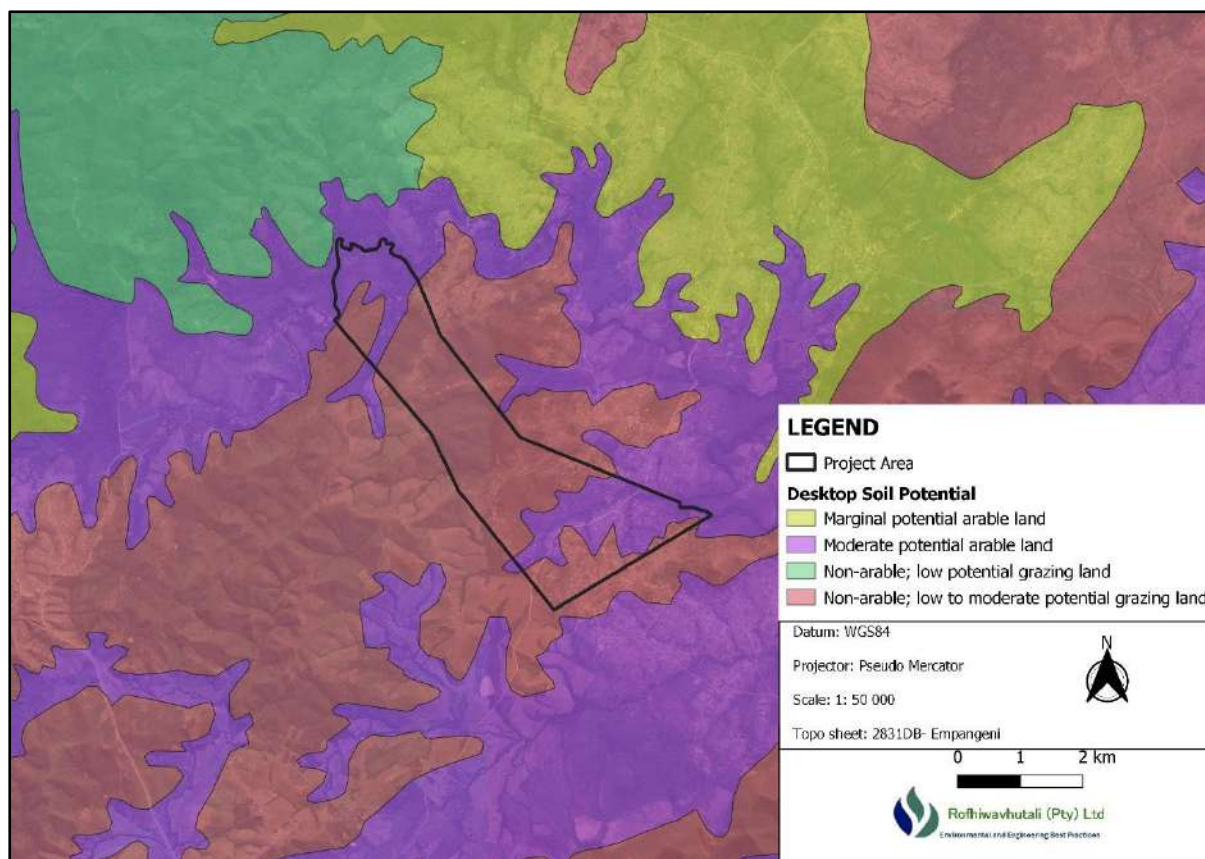


Figure 4-10: Soil Potential Associated with the Study Area

4.1.8. DAFF Screening Tool

The project area is characterised by a very high sensitivity to agriculture (Figure 4-11).

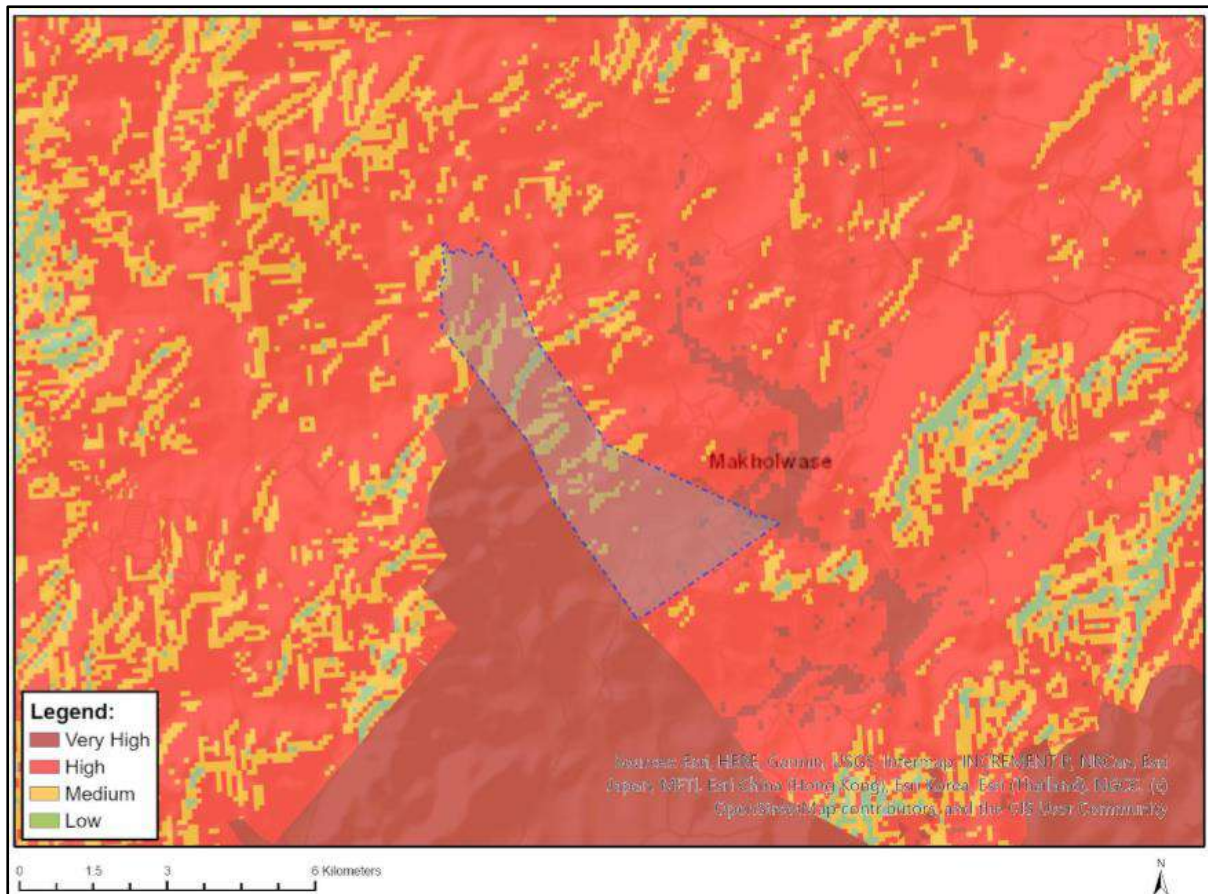


Figure 4-11: Screening tool Sensitivity

4.2. Identified Land Uses within the Study Area

The identified land uses within the study area include Illegal mining, shopping centre, the pl, livestock farming and commercial accommodation establishments. Figure 4-12 below illustrates the various land uses identified within the study area.

Table 4-2: Site Pictures showing activities onsite





Figure 4-12 : Various Land uses associated with the study area

4.3. Soil Form in the Study Area

Based on field observations conducted during the site assessment, the dominant soil forms identified within the study area include Bonheim, Mayo, Milkwood, Dundee, Valsrivier, Oakleaf, Glenrosa, Mispah, and Shortlands. These soil forms vary significantly in terms of depth, structure, fertility, and drainage, all of which influence land use capability, vegetation type, and agricultural potential (Figure 4-13).

- Bonheim soils are typically moderately deep to deep soils characterized by a structured B horizon with relatively high clay content. They often occur on gentle to moderate slopes and are generally associated with moderate base status. Bonheim soils have moderate to good agricultural potential where drainage is adequate; however, their clayey subsoil may restrict internal drainage and root penetration if compacted. With proper management, they can support cultivated crops and pasture.
- Mayo soils are generally moderately deep, with a well-developed structure and moderate clay accumulation in the subsoil. These soils commonly occur on gently sloping landscapes and have moderate fertility. Their agricultural potential is fair, but productivity depends on effective management of soil moisture and prevention of erosion, particularly where surface structure is weak.
- Milkwood soils are typically deep, well-drained soils with a relatively uniform profile and good structure. They are often associated with stable landscape positions and may exhibit moderate to high fertility depending on parent material. These soils generally have good water-holding capacity and are suitable for a range of agricultural uses, including cropping and pasture, provided nutrient management is maintained.
- Dundee soils are deep, sandy to sandy loam soils commonly found along river terraces and alluvial plains. They are generally well-drained and easy to cultivate due to their lighter texture. However, their lower clay content means they may have reduced nutrient- and water-holding capacity compared to more clay-rich soils. Under irrigation or with adequate rainfall and fertilisation, Dundee soils can support crop production, but they are more vulnerable to drought stress.

- Valsrivier soils are moderately deep to deep soils with a clay-enriched subsoil horizon. They are often associated with moderate to high base status and occur on footslopes and gently undulating terrain. These soils typically have moderate to good fertility and can support agricultural activities such as grazing and crop cultivation. However, their clayey nature may lead to seasonal waterlogging or slow permeability in certain areas.
- Oakleaf soils are generally deep, well-drained soils with a relatively uniform texture profile and limited horizon differentiation. They often occur on stable landscape positions and may have moderate agricultural potential. While their structure is usually favourable for root development, productivity depends on nutrient availability and moisture conditions. In some cases, they may require soil amendments to optimise crop yields.
- Glenrosa soils are shallow, stony soils typically found over hard rock, often associated with undulating to steep terrain. These soils have limited effective rooting depth and water-holding capacity, making them marginally suitable for agriculture, especially in dryland conditions.
- Mispah soils are also shallow and lithic, formed over hard rock, and often lack a well-developed horizon sequence. These soils are found in rocky outcrops and shallow soil landscapes, with very low arable potential, and are typically used for extensive livestock grazing or conserved as natural vegetation.
- Shortlands soils are moderately deep and generally well-structured, often associated with moderate to high base status and good fertility. These soils can support a range of agricultural uses, including pasture, grazing, and limited crop cultivation, particularly under managed conditions.





Figure 4-13: Pictures Dominant Soils forms within the study area outline.

4.4. Agricultural Potential and Sensitivity

Agricultural sensitivity in South Africa is generally restricted by climatic conditions, with specific mention to water availability (rainfall). Even within similar climatic zones, different soil types typically have different land use capabilities and agricultural sensitivities attributed to their inherent characteristics.

Highly sensitive agricultural land is defined as having the soil and terrain quality, growing season and adequate available moisture supply needed to produce sustained economically high crop yields when treated and managed according to best possible farming practices (Scotney *et al.*, 1987).

For this assessment, agricultural sensitivity was inferred in consideration of observed limitations to land use due to physical soil properties and prevailing climatic conditions. Figure 4-14 below depict the land capability of the soils identified within the study area.

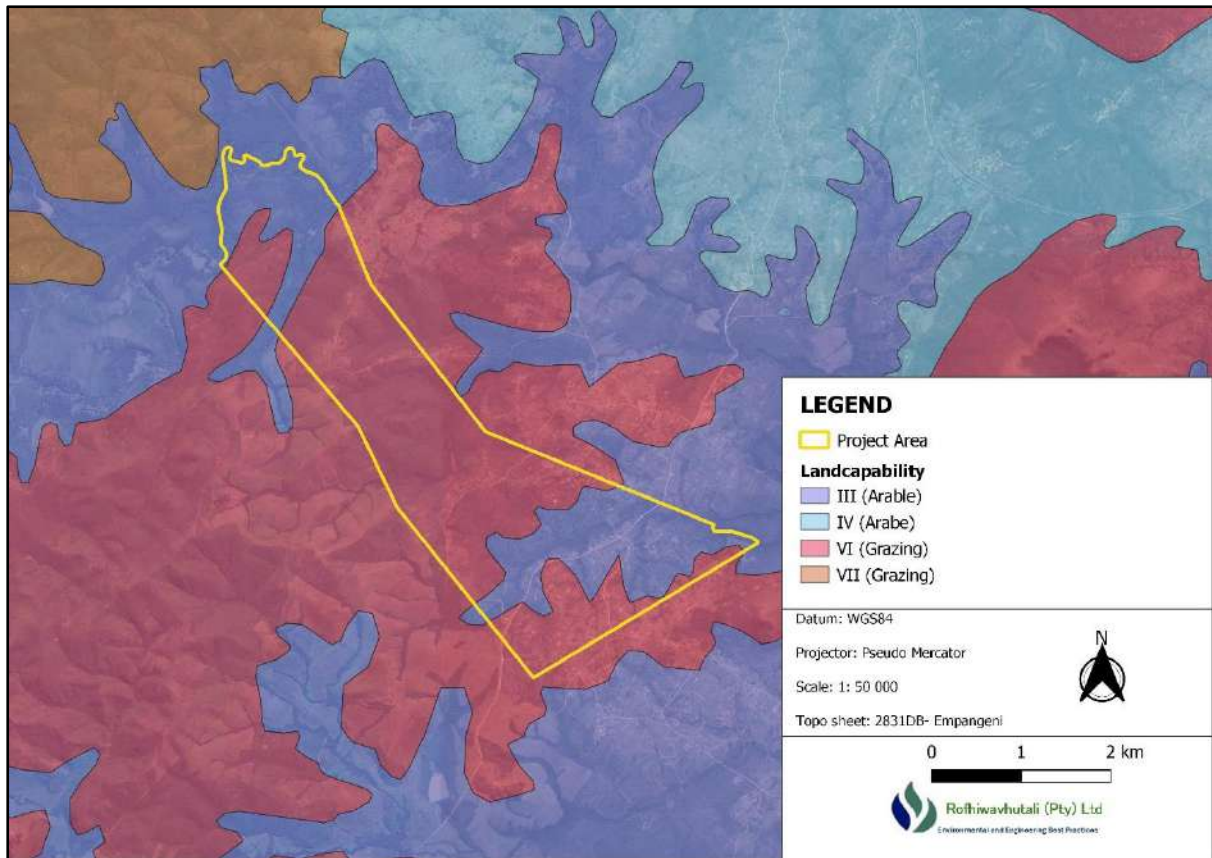


Figure 4-14: Map depicting the land capability of soils occurring within the study area.

5. Impact Assessment Methodology

5.1. Impact Assessment Methodology

The significance of each identified impact was determined using the approach outlined below (terminology from the Department of Environmental Affairs and Tourism Guideline document on EIA Regulations, April 1998). This approach incorporates two aspects for assessing the potential significance of impacts, namely occurrence and severity, which are further sub-divided as follows:

Occurrence		Severity	
Probability of occurrence	Duration of occurrence	Scale/extent of impact	Magnitude (severity) of impact

To assess each of these factors for each impact, the following four ranking scales are used:

Magnitude	Duration
(10) Very high / Unknown	(5) Permanent (post closure)
(8) High	(4) Long-term (impact ceases after site closure has been obtained)
(6) Moderate	(3) Medium-term (impact ceases after operational life of the activity)
(4) Low	(2) Short-term (impact ceases after the construction phase)
(2) Minor	(1) Immediate
Scale	Probability
(5) International	(5) Definite / Unknown
(4) National	(4) Highly Probable
(3) Regional	(3) Medium Probability
(2) Local	(2) Low Probability
(1) Site only	(1) Improbable
(0) None	(0) None

Once these factors are ranked for each impact, the significance of the aspects, occurrence and severity, is assessed using the following formula:

$$\text{SP (significance points)} = (\text{Magnitude} + \text{Duration} + \text{Scale}) \times \text{Probability}$$

The maximum value is 100 significance points (SP). The impact significance will then be rated as follows:

SP >60	Indicates high environmental significance	An impact which could influence the decision about whether or not to proceed with the project regardless of any possible mitigation.
SP 30 – 60	Indicates moderate environmental significance	An impact or benefit which is sufficiently important to require management, and which could have an influence on the decision unless it is mitigated.
SP <30	Indicates low environmental significance	Impacts with little real effect and which should not have an influence on or require modification of the project design.
+	Positive impact	An impact that is likely to result in positive consequences / effects.

For the methodology outlined above, the following definitions were used:

- i. **Magnitude** is a measure of the degree of change in a measurement or analysis (e.g., the severity of an impact on human health, well-being, and the environment), and is classified as none/negligible, low, moderate, high, or very high/unknown.
- ii. **Scale/Geographic** extent refers to the area that could be affected by the impact and is classified as site, local, regional, national, or international.
- iii. **Duration** refers to the length of time over which an environmental impact may occur i.e. immediate/transient, short-term, medium term, long-term, or permanent.
- iv. **Probability** of occurrence is a description of the probability of the impact occurring as improbable (less than 5% chance), low probability (5% to 40% chance), medium probability (40% to 60% chance), highly probable (most likely, 60% to 90% chance) or definite (impact will definite occur).

5.2. Impact Assessment Per Project Phase

5.2.1. Soil Erosion

Soil erosion is largely dependent on land use and soil management and is generally accelerated by anthropogenic activities. In the absence of detailed South African guidelines on erosion classification, the erosion potential and interpretation are based on field observations as well as observed soil profile characteristics. In general, soils with high clay content have a high-water retention capacity, thus less prone to erosion in comparison to sandy textured soils, which in contrast are more susceptible to erosion.

The soils of Mispah Farm occurring within the Project Area are susceptible to soil erosion due to their sandy nature and shallow depth. Soils which were vegetated prior to the proposed activities will be more susceptible to erosion during the construction phase if left bare or if not vegetated when in stockpile areas before the rainy season; thus, exposed to wind and storm water. Soil erosion is likely to have some negative impacts on soil and this will most likely lead to:

- Removal of organic matter and important soil nutrients essential for vegetation growth and thus reduced yield potential;
- Possible pollution and sedimentation of nearby water sources consequently affecting the water quality for livestock and
- Limited water availability essential for vegetation growth

Soil erosion will be attributed to the following activities throughout the life of the project.

- Construction Phase:
 - Site clearing, removal and associated disturbances to soils, leading to, increased runoff, erosion and consequent loss of land capability in cleared areas. And Potential frequent movement of digging machinery within loose and exposed soils, leading to excessive erosion
- Operation Phase:
 - Constant disturbances of soils, resulting in risk of erosion.
 - Ongoing disturbances to soils, resulting in increased sedimentation and risk of erosion, arising from mining activities.

5.2.2. Soil Compaction

Heavy equipment traffic during construction and activities is anticipated to cause soil compaction. The Project Area is more prone to compaction as there will be a significant increase in the use of vehicle and heavy machinery during the construction phase and if work is done when the soil is wet this may increase the soils susceptibility to compaction. Soil compaction may potentially lead to:

- Increased bulk density and soil strength, reduced aeration and lower infiltration rate;
- Consequently, it lowers crop performance via stunted aboveground growth coupled with reduced root growth;
- Destroyed soil structure, causing it to become more massive with fewer natural voids with a high possibility of soil crusting. This situation can lead to stunted, drought-stressed plants as a result of restricted water and nutrient uptake, which results in reduced crop yields;
- Soil biodiversity is also influenced by reduced soil aeration. Severe soil compaction may cause reduced microbial biomass. Soil compaction may not influence the quantity, but the distribution of macro fauna that is vital for soil structure including earthworms due to reduction in large pores.

Soil Compaction will be attributed to the following activities throughout the life of the Project.

- Construction Phase:
 - Site clearing and associated disturbances to soils, leading to, increased runoff, soil compaction and consequent loss of land capability in cleared areas.

- Potential frequent movement of digging machinery and construction vehicles within loose and exposed soils, leading to excessive soil compaction.
- Operational Phase:
 - Constant disturbances of soils, resulting in risk of compaction.
 - Movement of vehicles along the designated roads, this leads to soil compaction as well.

5.2.3. Potential Soil Contamination

Contamination sources are mostly unpredictable and often occur as incidental spills or leaks during the construction, operational phase and Decommissioning phase. Thus, the identified soils are considered equally predisposed to potential contamination. Therefore, strict waste management protocols as well as product management and activity specific Environmental Management Programme (EMPr) and monitoring guidelines should be adhered to during the construction, operational activities and Decommissioning phase. If the management protocols are not well managed this will more likely lead to:

- Contaminants leaching into the soil and thus potentially rendering the soil sterile, reducing the yield potential of soils.
- Potential reduction of water quality used for irrigation and for livestock use

Potential soil contamination is attributed to the following activities

- Construction Phase:
 - Spillage of petroleum hydrocarbons during construction of associated infrastructure
 - Disposal of hazardous and non-hazardous waste, including waste material spills and refuse deposits into the soil.
- Operational and Decommissioning Phase:
 - Leaching of hydrocarbons chemicals into the soils, leading to alteration of the soil chemical status as well as contamination of ground water.
 - Disposal of hazardous and non-hazardous waste, including waste material spills and refuse deposits into the soil.

5.2.4. Loss of Agricultural Land Capability

The loss of land capability is anticipated, as the land capability class for the study area is suitable for Arable, Wildlife, Forestry and Light Grazing. Large portions of soils will be removed and stockpiled and thus further potentially reducing the fertility status (sterilisation) of the soils and being prone to erosion. The proposed activities will lead to a permanent change of land use if not properly mitigated. Consequently, the loss of soils and the permanent change in land use will be localized to within the Project Area.

Loss of Grazing land Capability is attributed to the following activities.

- Construction phase:

- Site clearing, the removal of natural vegetation, and associated disturbances to soils, leading to increased nutrient leaching, runoff
- Potential indiscriminate disposal of hazardous and non-hazardous waste, including waste material spills and refuse deposits into the soil.
- Operational Phase:
 - Ongoing disturbances to soils, resulting in increased leaching of soil nutrients and risk of erosion, attributed to mining activities
 - Potential increase in concentrations of contaminant concentration in the soil.
 - Ongoing disturbance as a result of maintenance activities, leading to altered vegetation community structures, and consequently altering the quality and nutrient status of the soil

6. SOIL MANAGEMENT PLAN

6.1. Soil management during the construction phase

6.1.1. Minimise mining infrastructure footprint

- The footprint of the proposed infrastructure area should be clearly demarcated to restrict vegetation clearing activities within the infrastructure footprint.
- The construction of all infrastructure associated with the project will be within the mine project boundary.

6.1.2. Management and supervision of construction teams

On both large and small construction sites, supervision is critical in preventing accidents. Planning and distributing work, making decisions, monitoring performance and compliance, giving leadership and teamwork, and ensuring staff involvement are all typical supervisory duties. As a result, supervision plays a significant role in the success of a typical construction project, particularly in terms of ensuring that health and safety is successfully managed.

6.2. Location of stockpiles

- Ensure stockpiles are placed on a free draining location to limit erosion loss
- Stockpiles should be located on flat terrain, this will be to reduce erosion.

6.2.1. Topsoil stripping

- Soils should be stripped according to the soil types and recommended depths.
- strip the topsoil from all areas that will be disturbed by construction activities or driven over by vehicles.
- The topsoil will be stripped and loaded onto dump trucks.

- Topsoil is to be stripped when the soil is dry (as far as practical possible), as to reduce compaction; and
- To be stripped according to the stripping guideline and management plan, contained within this report and further recommendations contained within the rehabilitation plan, and stockpiled accordingly.

6.2.2. Stockpiling of topsoil

- Stockpiles are to be maintained in a fertile and erosion free state by sampling them annually for macro nutrients and pH.
- Prevent unauthorised borrowing of stockpiled soil.

6.2.3. Demarcation of topsoil stockpiles

- Berms should be placed around stockpiled soil to prevent soil loss due to erosion.
- The stockpiles area should be demarcated.

6.2.4. Prevention of stockpile contamination

- The handling of the stripped topsoil will be minimized to ensure the soil's structure does not deteriorate.
- Prevent any spills from occurring.
- If a spill occurs, it is to be cleaned up immediately and reported to the appropriate authorities.

6.2.5. Terrain stability to minimise erosion potential

- Stockpiles are to be maintained in a fertile and erosion free state by sampling them annually for macro nutrients and pH.
- Berms should be placed around stockpiled soil to prevent soil loss due to erosion.
- The stockpiles will be vegetated where the natural establishment of vegetation by the natural occurring seed bank is not sufficient (details contained in rehabilitation plan) in order to reduce the risk of erosion, prevent weed growth and to reinstitute the ecological processes within the soil.
- Flat terrain should be ensured, as steep slopes will promote erosion.

6.2.6. Management of access and haulage roads

- strict access control practiced preventing vehicles driving on the stockpile.
- Compaction of the removed topsoil should be avoided by prohibiting traffic on stockpiles.

6.2.7. Prevention of soil contamination

- Landfilling, sometimes known as "dig and haul," is the most basic method of soil restoration. This method involves removing contaminated soil from its original location

and transporting it to a secure landfill, which is a constructed structure with impermeable liners, leachate drains, and dike enclosures. Landfilling is a well-known method of cleaning up hazardous waste sites.

- Soil washing refers to the size separation, gravity separation, or attrition scrubbing of pollutants absorbed to discover soil particles in an aqueous solution. Soil washing relies on the ionic strength, soil acidity, redox potential, and complexation of washing solutions to mobilize heavy metals. An ideal washing solution would boost the solubility and mobility of heavy metal pollutants while interacting only weakly with soil constituents and being biodegradable and harmless.

6.3. Soil management during the operational phase

6.3.1. Managing potential soil contamination during the operational phase

- Prevent any spills from occurring.
- If a spill occurs, it is to be cleaned up immediately and reported to the appropriate authorities.
- All storage areas (for fuels and lubricants) will be compacted and have bunded containers to prevent soil pollution and appropriate oil separators installed.
- Water runoff traps should be constructed at the vehicle service sites to prevent polluted water runoff into areas that are not impacted upon.
- All vehicles are to be serviced regularly in a correctly bunded area.
- Hydrocarbon management procedure to contain details of emergency clean-up procedures and
- Leaking vehicles will have drip trays place under them where the leak is occurring.

Table 6-1: Environmental impact Assessment Table

POTENTIAL IMPACT	PHASE In which impact is anticipated	Magnitude	Duration	Scale	Probability	Significance	Significance without Mitigation	Magnitude	Duration	Scale	Probability	Significance	Significance with Mitigation	Detailed Mitigation Measures
Construction Phase														
Soil compaction and erosion due to vegetation clearance and access roads	Construction	6	3	2	4	44	Moderate	4	2	2	3	24	Low	Minimise clearing; use existing roads; avoid steep slopes; apply erosion controls
Topsoil loss and fertility reduction	Construction	6	3	2	4	44	Moderate	4	4	2	2	20	Low	Avoid subsoil mixing
Altered drainage patterns from trenching and roads	Construction	6	3	2	3	33	Moderate	4	2	2	2	16	Low	Align infrastructure with contours; restore drainage after use
Site clearing, removal and associated disturbances to soils, leading to, increased runoff, erosion and consequent loss of land capability in cleared areas.	Construction	5	3	2	4	40	Moderate	4	2	2	3	24	Low	No site-clearing activities should take place during periods of heavy rainfall.
Potential hazardous and non-hazardous waste disposal, including waste material spills and refuse deposits into the soil.	Construction	5	3	2	4	40	Moderate	4	2	2	3	24	Low	Development of detailed procedures for spill containment and soil clean-up.
Potential leaching of hydrocarbon chemicals into the soils from construction vehicles leads to the alteration of the soil's chemical status. Potential hazardous and non-hazardous waste disposal, including waste material spills and refuse deposits into the soil.	Construction	6	3	2	3	33	Moderate	4	2	2	3	24	Low	Implementing regular site inspections for materials handling and storage.
Operational Phase														
Loss of arable/grazing land due to trenching/drilling	operational	6	3	2	4	44	Moderate	4	3	2	2	18	Low	Avoid high-potential Agri-zones; drill selectively; minimise trench footprint
Soil contamination from machinery/oil/fuel leaks	operational	6	4	2	3	36	Moderate	2	3	2	2	14	Low	Maintain equipment; use drip trays, bunded refuelling areas
Reduced productivity in bulk sampling zones	operational	6	3	2	4	44	Moderate	2	3	2	2	14	Low	Control Vehicle Movement and Site Demarcation to reduce compaction beyond the trench area
Soil compaction from heavy machinery	operational	6	3	2	4	44	Moderate	4	3	2	2	18	Low	Designate travel paths; decompact soil post-activity
Operation and maintenance of the road; constant traffic and frequent soil disturbances resulting in land capability loss.	operational	5	4	2	3	33	Moderate	3	3	2	2	16	Low	
Potential frequent movement of digging machinery within loose and exposed soils, leading to excessive erosion.	operational	6	3	2	4	44	Moderate	4	3	2	3	27	Low	The footprint of the proposed development and construction activities should be clearly demarcated to restrict vegetation clearing activities within the infrastructure footprint as far as practically possible.
Decommissioning and Closure Phase														
Rehabilitation and recovery of land capability	Decommissioning	6	2	2	4	40	Moderate	4	2	2	3	24	Low	Backfill; replant; recontour; use local species; monitor post-rehab
Potential future decommissioning activities will likely involve dismantling and removing the supporting infrastructure, as well as transferring waste materials to disposal, recycling, and/or treatment facilities, as applicable (where re-use is not possible).	Decommissioning	6	2	2	3	30	Moderate	4	2	2	3	24	Low	The study area should be revegetated with indigenous vegetation to help with soil compaction, runoff, erosion and dust control as required or returned to agricultural use.
Potential decommissioning activities will likely involve dismantling on-site, equipment and facilities. During this period, there will be heavy vehicular traffic, thus increasing the likelihood of soil contamination.	Decommissioning	6	2	2	3	30	Moderate	4	1	2	3	21	Low	Any portions of the site with compacted soil should be decompact.

7. CONCLUSION AND RECOMMENDATIONS

Conclusion

Rofhiwavhutali (Pty) Ltd was appointed to undertake a Soil, Land Use, Land Capability and Agricultural Potential Verification Assessment as part of the Environmental Authorisation (EA) process for the Prospecting Right Application for coal on Lot 289 Empangeni 13389 GU and Lot 285 Empangeni 13400 GU, situated within the King Cetshwayo District Municipality, KwaZulu-Natal Province.

The soil pH across the study area ranges between 5.5 and 6.4, reflecting slightly acidic conditions. This range is generally favourable for most cultivated crops, as nutrient availability is typically good within this threshold. From a chemical perspective, the soils do not present significant pH-related limitations to plant growth.

The desktop erosion assessment indicates that the majority of the site falls within a moderate soil loss category, suggesting susceptibility to erosion particularly during periods of intense rainfall. A smaller portion in the north-eastern section is classified as low risk, reflecting relatively stable terrain conditions, while the south-eastern section is classified as high risk, likely due to slope gradients, soil characteristics, and/or vegetation cover. Overall, the combination of gentle to moderate slopes, existing surface cover, and inherent soil stability contributes to a generally stable landscape; however, localized erosion risks remain and would require management should land disturbance occur.

The project area is dominated by Soil Classes 5, 6, 10, 11 and 12, largely consisting of undifferentiated clay soils and soils exhibiting pedocutanic (clay-enriched) horizons. These soils are typically characterised by moderate to high clay content, reduced permeability, and limited internal drainage. The presence of pedocutanic horizons reflects clay illuviation processes, resulting in dense, structured subsoils that may restrict vertical water movement and root penetration. Consequently, seasonal waterlogging and perched water tables may develop in poorly drained or low-lying areas. These characteristics influence infiltration rates, runoff generation, and overall hydrological response of the landscape.

The predominant soil groups identified include Haplic Luvisols and Luvic Kastanozems, both generally associated with moderate to high base status and moderate natural fertility. While these soils may possess reasonable agricultural potential under suitable management, clay accumulation in the subsoil influences drainage behaviour and may limit intensive cultivation in certain areas.

Based on field observations and desktop analysis, the dominant soil forms identified within the study area include Bonheim, Mayo, Milkwood, Dundee, Valsrivier, Oakleaf, Glenrosa, Mispah and Shortlands. These soil forms display considerable variability in depth, structure, fertility and drainage characteristics. Deeper and better-structured soils such as Bonheim, Milkwood, Valsrivier, Dundee and Shortlands exhibit moderate agricultural potential where managed appropriately. In contrast, shallow and lithic soils such as Glenrosa and Mispah have limited effective rooting depth and low arable potential, making them more suitable for extensive grazing or conservation purposes.

Land capability and agricultural potential across the study area are predominantly classified as non-arable to low and moderate potential grazing land, with only limited portions identified as moderate potential arable land. The majority of the area is therefore constrained for intensive crop production due to inherent soil limitations such as clay-rich subsoils, drainage restrictions, shallow depth in places, and moderate erosion susceptibility.

The study area is characterised by predominantly clay-rich soils with moderate base status, variable drainage conditions, and moderate erosion susceptibility. While certain portions of the site may support grazing and limited crop production under appropriate management practices, the overall agricultural potential is constrained.

It is the opinion of the specialist that without mitigation, there is a significant risk to the long-term viability of moderate-potential soils that could support agricultural use. As such, appropriate and integrated mitigation measures should be adopted to reduce the risk of losing these valuable soil resources, in line with sustainable development principles. It is far more acceptable to sacrifice small areas of land with limited cultivation potential, due to inherent soil limitations, than to compromise higher, potential agricultural land, which is far less common and more difficult to replace elsewhere in the country.

The screening tool analysis was conducted, which presented the findings as the impact on agricultural resources being very High sensitivity in terms of agricultural potential. Based on the outcomes of the field assessment, this was found to have a less significant impact as presented on the screening tool due to the dominant soil forms that are not high-potential agricultural soils due to various limitations, including shallower depth and requiring intensive management strategies to cultivate. It is the opinion of the specialist that this study provides the relevant information required for the basic Assessment of the project to ensure that appropriate consideration of the agricultural resources in the study area are made in support of the principles of Integrated Environmental Management (IEM) and sustainable development.

Recommendations

- The project operations must stay inside the clearly delineated footprint zones;
- During the construction period, bare soils within the access roads can be routinely moistened with water to minimize dust, especially when strong winds are anticipated according to the local weather prediction; and
- Soil Compaction is usually greatest when soils are moist, so soils should be stripped when moisture content is as low as possible. If they have to be moved when wet, truck and shovel methods should be used as bowl scrapers create excessive compaction when moving wet soils;
- Ensure proper handling and storage of hazardous chemicals and materials (e.g., fuel, oil, cement, concrete, reagents, etc.) as per their corresponding Safety Data Sheets.
- As much as is practically possible, the projected development and construction activities' footprints should be clearly marked to limit vegetation clearing activities inside the infrastructural footprint;
- Usable topsoil from the construction of the surface infrastructure areas must be removed prior to construction and stockpiled separately within the demarcated areas

with measures to protect this valuable resource from impacts such as chemical contamination as well as mixing with less valuable overburden types.

- Development of detailed procedures for spill containment and soil clean up.
- Vehicle and equipment maintenance should be carried out in designated, appropriate facilities fitted with spillage containment, floors, and sumps to capture fugitive oils and greases.
- Unnecessary traffic and movement over the areas targeted for construction must be avoided, especially heavy machinery
- Revegetate with an indigenous grass mix, to re-establish a protective cover, in order to minimise soil erosion and dust emissions.

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